Initial Environmental Examination

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India: Rajasthan Urban Sector Development Investment Program—Baran Roads Improvement Sub-project (Tr-03)

Prepared by Local Self Government Department

For the Government of Rajasthan
Rajasthan Urban Infrastructure Development Project

ABBREVIATIONS

ADB	—	Asian Development Bank
BMB	—	Baran Municipal Board
BOQ	—	Bill of Quantity
CBO	—	Community-based Organization
CFE	—	Consent for Establishment
CFO	—	Consent for Operation
CGWB	—	Central Ground Water Board
CLC	—	City Level Committees
CLIP	—	City Level Investment Plan
CWR	—	Clear Water Reservoirs
DSC	—	Design and Supervision Consultants
EAC	—	Expert Appraisal Committee
EARF	—	Environmental Assessment Resettlement Framework
EIA	—	Environmental Impact Assessment
EMP	—	Environmental Management Plan
EMS	—	Environmental Monitoring Specialist
EPA	—	Environmental Protection Agency
GLR	—	Ground Level Reservoir
GRC	—	Grievance Redress Committee
H&S	—	Health and Safety
IEE	—	Initial Environmental Examination
IPIU	—	Investment Program Implementation Unit
IPMC	—	Investment Program Management Consultants
IPMU	—	Investment Program Project Management Unit
ITI	—	Industrial Training Institutes
JNNURM	—	Jawaharlal Nehru National Urban Renewal Mission
LSGD	—	Local Self Government Department
MFF	—	Multitranche Financing Facility
MLD	—	Million Liters Per Day
MOEF	—	National Ministry of Environment and Forests
NAAQS	—	National Ambient Air Quality Standards
NGO	—	Nongovernmental Organization
NRRP	—	National Resettlement and Rehabilitation Policy
NRW	—	Non-Revenue Water
O&M	—	Operation and Maintenance
OHSA	—	Occupational Health and Safety Administration
OHSR	—	Overhead Service Reservoirs
OMC	—	Operations and Maintenance Contractors
PHED	—	Public Health Engineering Department
PIU	—	Project Implementation Unit
PMU	—	Project Management Unit
PWD	—	Public Works Department
ROW	—	Right of Way
RPCB	—	Rajasthan State Pollution Control Board
RUIDP	—	Rajasthan Urban Infrastructure Development Project
RUSDIP	—	Rajasthan Urban Sector Development Investment Programme
SEIAA	—	State Environment Impact Assessment Authority
SPS	—	Safeguard Policy Statement
STP	—	Sewage Treatment Plant
TDS	—	Total Dissolved Solids
TOR	—	Terms of Reference
UIDSSMT	—	Urban Infrastructure Development Scheme for Small and

		Medium Towns
ULB	—	Urban Local Body
USEPA	—	United States Environmental Protection Agency
WTP	—	Water Treatment Plant

Weights and Measures

lakh	–	100 thousand = 100,000
crore	–	100 lakhs = 10,000,000
$\mu g/m^3$	–	Micrograms per Cubic Meter
km	–	Kilometer
lpd	–	Liters Per Day
m	–	Meter
mg/l	–	Milligrams Per Liter
mm	–	Millimeter
ppm	–	Parts Per Million

NOTE{S}

(i) In this report, "$" refers to US dollars.
(ii) “INR” and “Rs” refer to Indian rupees

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EXECUTIVE SUMMARY

1. Rajasthan Urban Sector Development Investment Program (RUSDIP) is intended to optimize social and economic development in 15 selected towns in the State, particularly district headquarters and towns with significant tourism potential. RUSDIP Phase II is being implemented over a seven year period beginning in 2008, and being funded by a Multitranche Financing Facility (MFF) loan from the Asian Development Bank (ADB). The Executing Agency is the Local Self-Government Department (LSGD) of the Government of Rajasthan; and the Implementing Agency is the Project Management Unit (PMU) of the Rajasthan Urban Infrastructure Development Project (RUIDP). ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for Environmental Assessment are described in ADB's SPS. This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, loans involving financial intermediaries, and private sector loans.

2. This Initial Environmental Examination (IEE) has been prepared for the Baran Roads Improvement Subproject as part of RUIDP Phase II – Tranche 3 (additional). The subproject site is located in Baran town, the administrative headquarters of Baran District. The subproject covers widening and strengthening of 5 existing city roads in Baran town.

3. The subproject is needed to improve the roads network system particularly widening and strengthening of roads of Baran Town.

4. Detailed design started in the June 2013 and completed in October 2013. Construction of all elements may begin in the November 2013 after completing all the formalities, and work will be completed in 12 months.

5. The subproject sites are existing 5 roads within the Baran town. It is not prone to water-logging, salinization, and flash flood. There are also no protected areas, wetlands, mangroves, or estuaries within the sub project sites. Trees, vegetation (mostly shrubs and grasses), and animals in the area of the subproject site are those commonly found in built-up areas.

6. Potential negative impacts were identified in relation to construction and operation of the improved infrastructure. No major significant impacts were identified as being due to the subproject design or location. An Environmental Management Plan (EMP) is proposed as part of this IEE which includes (i) mitigation measures for significant environmental impacts during implementation, (ii) environmental monitoring program, and the responsible entities for mitigation, monitoring, and reporting; (iii) public consultation and information disclosure; and grievance redress mechanism. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. A number of impacts and their significance have already been reduced by amending the designs.

7. During the construction phase, impacts mainly arise from the operation of plants and construction equipments which can result to increase in particulate matters, gaseous pollutants and noise levels, disturbance to residents and businesses along the delivery routes, and traffic interference. These are the common impacts of construction in built-up areas, and there are well developed methods for their mitigation.

8. Special measures were also developed to protect workers and the public from exposure to carcinogenic asbestos fibres in the event that asbestos cement pipes used in the existing water supply system are uncovered accidentally during excavation work

9. There were limited opportunities to provide environmental enhancements, but certain measures were included. For example there is provision of compensatory plantation if any tree is cut due to construction works. The sub project will employ in the workforce people who live in the vicinity of construction sites to provide them with a short-term economic gain; and ensure that people employed in the longer term to maintain and operate the new facilities are residents of nearby communities.

10. Once the system is operating the environmental condition of the town will be improved due to improved road surface and width resulting lesser pollution from the vehicles.

11. Also, the work will be conducted in areas that have already been exploited for existing roads within Right of Way (ROW), so there will be no need for land acquisition.

12. Mitigation will be assured by a program of environmental monitoring to be conducted during construction and operation stages. The environmental monitoring program will ensure that all measures are implemented, and will determine whether the environment is protected as intended. It will include observations on- and off-site, document checks, and interviews with workers and beneficiaries. Any requirements for remedial action will be reported to the IPMU.

13. The main impacts of the operating the improved road network and other subproject components will be beneficial to the citizens of Baran town because they will be provided with safe and comfortable city roads.

14. The stakeholders were involved in developing the IEE through face-to-face discussions on site and a large public meeting held in the town, after which views expressed were incorporated into the IEE and the planning and development of the project. The IEE will be made available at public locations in the town and will be disclosed to a wider audience via the ADB website. The consultation process will be continued and expanded during project implementation, when a nationally-recognised NGO will be appointed to handle this key element to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation.

15. The subproject is unlikely to cause significant adverse impacts. The potential adverse impacts that are associated with design, construction, and operation can be mitigated to standard levels without difficulty through proper engineering design and the incorporation or application of recommended mitigation measures and procedures. Based on the findings of the IEE, the classification of the Project as Category “B” is confirmed, and no further special study or detailed EIA needs to be undertaken to comply with ADB SPS (2009) or GoI EIA Notification (2006).

I. INTRODUCTION

A. Purpose of the Report

1. The Rajasthan Urban Sector Development Investment Program (RUSDIP) is intended to optimize social and economic development in 15 selected towns in the State, particularly district headquarters and towns with significant tourism potential. This will be achieved through investments in urban infrastructure (water supply; sewerage and sanitation; Roads improvement; urban drainage; urban transport and roads), urban community upgrading (community infrastructure; livelihood promotion), and civic infrastructure (art, culture, heritage and tourism; medical services and health; fire services; and other services). RUSDIP will also provide policy reforms to strengthen urban governance, management, and support for urban infrastructure and services. The assistance will be based on the state-level framework for urban reforms, and institutional and governance reforms recommended by the Government of India (the Government) through the Jawaharlal Nehru National Urban Renewal Mission (JNNURM) and Urban Infrastructure Development Scheme for Small and Medium Towns (UIDSSMT).

2. RUIDP Phase II is implemented over a seven year period beginning in 2008, and funded by a loan via a Multitranche Financing Facility (MFF) of the Asian Development Bank (ADB). The Executing Agency is the Local Self-Government Department (LSGD) of the Government of Rajasthan; and the Implementing Agency is the Project Management Unit (PMU) of the Rajasthan Urban Infrastructure Development Project (RUIDP).

3. This Initial Environmental Examination (IEE) has been prepared for the Baran Roads improvement subproject as part of RUIDP Phase II. The subproject covers widening and strengthening of 5 existing roads of Baran town.

4. This IEE covers the general environmental profile of Baran and includes an overview of the potential environmental impacts and their magnitude on physical, ecological, economic, and social and cultural resources within the subproject's influence area during design, construction, and operation stages. An Environmental Management Plan (EMP) is also proposed as part of this IEE which includes mitigation measures for significant environmental impacts during implementation of the project, environmental monitoring program, and the responsible entities for mitigation and monitoring.

B. Extent of the Initial Environmental Examination

5. This IEE was prepared on the basis of detailed screening and analysis of all environmental parameters, field investigations and stakeholder consultations to meet the requirements for environmental assessment process and documentation as per ADB's Safeguard Policy Statement (2009, SPS) and Government of India (the Government) Environmental Impact Assessment (EIA) Notification of 2006.

1. ADB Policy

6. ADB requires the consideration of environmental issues in all aspects of the Bank's operations, and the requirements for Environmental Assessment are described in ADB's SPS. This states that ADB requires environmental assessment of all project loans, program loans, sector loans, sector development program loans, loans involving financial intermediaries, and private sector loans.

7. **Screening and Categorization** The nature of the environmental assessment required for a project depends on the significance of its environmental impacts, which are related to the type and location of the project, the sensitivity, scale, nature and magnitude of its potential impacts, and the availability of cost-effective mitigation measures. Projects are screened for their expected environmental impacts are assigned to one of the following four categories:

(i) Category A: Projects could have significant adverse environmental impacts. An EIA is required to address significant impacts.
(ii) Category B: Projects could have some adverse environmental impacts, but of lesser degree or significance than those in category A. An IEE is required to determine whether significant environmental impacts warranting an EIA are likely. If an EIA is not needed, the IEE is regarded as the final environmental assessment report.
(iii) Category C: Projects are unlikely to have adverse environmental impacts. No EIA or IEE is required, although environmental implications are reviewed.
(iv) Category FI: Projects involve a credit line through a financial intermediary or an equity investment in a financial intermediary. The financial intermediary must apply an environmental management system, unless all Projects will result in insignificant impacts.

8. **Environmental Management Plan** An EMP which addresses the potential impacts and risks identified by the environmental assessment shall be prepared. The level of detail and complexity of the EMP and the priority of the identified measures and actions will be commensurate with the Project's impact and risks.

9. **Public Disclosure** ADB will post the following safeguard documents on its website so that affected people, other stakeholders, and the general public can provide meaningful inputs into the project design and implementation:

(i) For environmental category A projects, draft EIA report at least 120 days before Board consideration;
(ii) Final or updated EIA and/or IEE upon receipt; and
(iii) Environmental Monitoring Reports submitted by the Investment Program Implementation Unit (IPIU) during project implementation upon receipt.

2. National Law

10. The Government's EIA Notification of 2006 (replacing the EIA Notification of 1994), sets out the requirement for environmental assessment in India. This states that Environmental Clearance is required for specified activities/projects, and this must be obtained before any construction work or land preparation (except land acquisition) may commence. Projects are categorized as A or B depending on the scale of the project and the nature of its impacts.

11. Categories A projects require EC from the National Ministry of Environment and Forests (MOEF). The proponent is required to provide preliminary details of the project in the form of a Notification, after which an Expert Appraisal Committee (EAC) of the MOEF prepares comprehensive Terms of Reference (TOR) for the EIA study, which are finalized within 60 days. On completion of the study and review of the report by the EAC, MOEF considers the recommendation of the EAC and provides the environmental clearance if appropriate.

12. Category B projects require environmental clearance from the State Environment Impact Assessment Authority (SEIAA). The State level EAC categorizes the project as either B1 (requiring EIA study) or B2 (no EIA study), and prepares TOR for B1 projects within 60 days. On completion of the study and review of the report by the EAC, the SEIAA issues the EC based on the EAC recommendation. The Notification also provides that any project or activity classified as category B will be treated as category A if it is located in whole or in part within 10 km from the boundary of protected areas, notified areas or inter-state or international boundaries.

13. The only type of infrastructure provided by the RUSDIP that is specified in the EIA Notification is Solid Waste Management (construction of Landfill site) where an EC is required. The small road projects like that of this project do not require EC.

II. DESCRIPTION OF THE PROJECT

A. Type, Category and Need

14. **Type** This is a Roads improvement subproject intended to improve the current situation in Baran in terms of providing a safe and comfortable city road network.

15. **Category** Environmental examination indicates the proposed subproject falls within ADB's environmental Category B[1] projects. Justification for this category 'B' follows in this report. The Project components will only have small-scale, localized impacts on the environment, and can be mitigated. Under ADB procedures such projects require an IEE to identify and mitigate the impacts, and to determine whether further study or a more detailed EIA may be required.

16. **Need** The subproject is needed because the present city road network of Baran town is insufficient to cope with the growing needs of safe and pollution free road network with the ease of growing population and increasing number of vehicles. Presently selected roads are having insufficient width and are in damaged and poor conditions. As per requirement widening and strengthening of total 4.340 km length of the 5 city road is, therefore, absolutely necessary to ease traffic situation within the city, to provide relief and time savings through traffic, and to reduce accidents, congestion and operating expenses of the vehicles. This will also improve the environment of Baran city.

B. Location

17. **Location** The subproject sites are existing 5 different roads located in Baran town, in the headquarters town of Baran district, whose length varies from 470 m to 2.00 km. Total length of all the 5 roads is around 4.340 km. The details of roads are as below-

1. ROB (Baran end) to Charmurti Chouraha (700 mtrs.)
2. Charmurti Chouraha to Pratap Chowk (470 mtrs.).
3. NH76 to Rawanji ka Chowk, Lanka Colony (700 mtrs.).
4. Civil Lines (Sahkar Bhawan) to NH27 (470 mtrs)
5. Babji Nagar (Devine Public School) to NH27 (2.000 Kms.)

Photographs of proposed 5 roads are attached as **Appendix 4** with this report.

C. Implementation Period and Project Cast

18. Detailed design started in the June 2013 and completed in October 2013. Construction of all elements will begin in the November 2013 after completing all the formalities, and work will be completed in 12 months. Total project cast is estimated as INR 6.55 crores.

D. Description of the Subproject

1. Existing Roads condition

[1] This category includes projects judged likely to have some adverse environmental impacts, but of less significance than Category A projects. Accordingly, there is a need for an ADB IEE during project preparation to determine whether any impacts are likely to be sufficiently significant to warrant further studies or an EIA.

19. The section of road of Baran city passes from various busy commercial/populated area of city. At present the existing carriageway varies from 3.5 to 9.0 m for most of the stretch. Due to inadequate carriageway width, the road becomes congested resulting into low speeds and to possibility of accidents, whereby the traffic passing through this stretch suffers the most. There are number of schools, commercial buildings and hospital on the road which gets disturbed due to traffic congestion and horn blowing.

For sections of the package road, no change in the existing gradients is proposed as the same are satisfactorily within the IRC Standards throughout. Widening, however, has been proposed according to present requirement of 4-laning (divided), 3 Lane and 2 lane.

2. Subproject Components

20. Descriptions of proposed works, in existing 5 roads, taken in the subproject are as follows-

i) **Road No. 1 (ROB to Charmurti Chouraha)** starting from ROB (Baran end) to Charmurti Chouraha is an important road as this road connects newly constructed ROB at LC37 to Rajasthan Roadways Bus station and Baran Railway Station and also connects Jhalawar road, Mangrol and main market and city. Total road length is around 1.1 km, out of 400 m is already constructed by PWD. The department has widened the road to 14 m with CC pavement. The remaining section towards ROB is to be improved. The existing bituminous paved portion of the road is 7.0 m with average 1.0m wide earthen shoulder on either side of the road. The road has approx. ROW of 18.5 m. being a commercial area road the average traffic is high. Seeing the commercial traffic and future expansion it is planned to widen this stretch to four lanes divided with 1.2 m median. There is also a culvert and 30m stretch on charmurthi chauraha which is to be improved.

ii) **Road No. 2 (Charmurti Chouraha to Pratap Chowk)** starts from Charmurti Chouraha and ends at Pratap Chowk. This is the Main city commercial road. Many government offices, a school and a hospital are located on this road. The existing bituminous paved portion of the road is four lanes. Condition of the paved surface is fair. Due to accumulation of water from minor streets, it is proposed to strengthen the road with CC pavement and also raise the level of road. The length of the road stretch is 470 m.

iii) **Road No. 3 (NH76 to Rawanji ka Chowk, Lanka Colony)** is a colony road. The existing road is partially bituminous and most of the section is paved with WBM. Bituminous pavement width is 7.0 m and is in poor condition. Available building to building distance is around 15.0 m. Drain is present on both side of the road. The road level is down compared to main road. Vibro Pressed Drain is proposed for this stretch of Lanka colony road. Two sections are considered for this road on both sides, these are 0.6 X0.6 for Ch 0 to 250 and 0.6 X 0.75 for rest of 275 lengths. Some educational facilities, two temples and Ravan Dahan site (on Dussehera festival only) is located along this road. This is an important road as this leads to Hindu cremation ground (Muktidham).

iv) **Road No. 4 (Civil Lines to NH27)** road is connecting link between civil line and NH -27. The existing bituminous paved portion of the road is 3.5 m wide. The length of the road stretch is 870m. Available building to building width is around 15m. Condition of the road is good. Seeing the intensity of traffic and pedestrians it is suggested to widen the road to 5.5 m with 1.0 m wide shoulder. Vibro pressed drain is proposed for Single section of 0.6 X 0.6 for civil line road.

v) **Road No.5 (Babji Nagar to NH27)** is also connecting link between Baran city with NH-27. This is a colony road having very low volume of traffic. Existing BT road of 3.4 m (avg) is completely damaged. The length of the road is around 1.7 km and ROW is 30 to 35 feet.

3. Traffic Projections

21. Growth of Traffic for a city is altogether different from growth for a highway. For a city it depends on population of the town and density in particular area. Other factors which affect the traffic intensity of the road are the location of the road in that city and rate of extension of the city also effect traffic growth.

22. The road width in urban areas is designed to accommodate the design peak hour traffic. The design peak hour traffic is estimated based on a simple projection of present peak hour traffic for a design period of 15-20 years (adopted for arterial roads as per IRC-86:1984). The growth rate of different vehicles is estimated by Transport Demand Elasticity Method considering past traffic data, vehicle registration data, change of socio-economic pattern in urban areas, future development plan etc. In absence of such data, it is very difficult to estimate the actual growth rate for different vehicles.

23. In general, the average traffic growth rate for this type of urban areas (Baran) is around 5%. The growth rate as per IRC 37-2001 is 7.5% which is higher than the actual growth at present. The present traffic is projected for both the growth rates i.e. 7.5% & 5% for design period of 20 years and the projected traffic is presented in Table 1 below-

Table-1: Traffic Projections for Baran City Roads

Sl. No.	**Year**	**PCU in Peak Hour**							
Growth Rate		7.5%	5%	7.5%	5%	7.5%	5%	7.5%	5%
Road no.		**Road no.1**		**Road no.2**		**Road no.4**		**Road no.5**	
1	2013	893	893	1205	1205	157	157	180	180
2	2018	1282	1140	1730	1538	225	200	258	230
3	2023	1841	1455	2484	1963	324	256	371	293
4	2028	2642	1856	3565	2505	465	326	533	374
5	2033	3793	2369	5119	3197	620	397	711	455

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4. Geometric Cross-section

The proposed geometric cross-section for development of five Baran city roads is tabulated in table 2 below. Sections of roads are proposed according to predicted traffic intensity and availability of distance between buildings.

Table 2: Proposed Geometric cross-section for Baran city roads

Sr. No	**Road**	**Length of Road**	**Carriageway(m)**		**Median (m)**	**Shoulder (m)**	
			BT	**CC**		**GSB**	**Interlocking**
1.	ROB to Charmuthi Cauraha Road	730		2 X 7.0	1.2		2 X 1.5
2.	Charmuthi Chauraha to Pratap Chowk road	470		2 X 7.0			2 X 1.0
3.	Lanka colony Road	502		7.0	-	2 x 1.0	
4.	Civil line to NH-27 road	870	5.5		-	2 X 1.0	

III. DESCRIPTION OF THE ENVIRONMENT

A. Physical Resources

1. Administrative Boundaries

20. Baran city is situated in the south-eastern part of “Hadoti Plateau” at an altitude of about 260 meters above Mean Sea Level (MSL). It is located at 250-6’ North Latitude and 760-31’ East Longitude. The city is well connected by roads linked with other cities by the NH- 76 (Pindwara-Kota-Baran-Shivapuri) and SH-19 (Indergarh-Mangrol- Jhalawar-Dag Agra). The city is on Kota – Bina rail line. Nearest airport is Kota which is 72 km away from the Baran city. The city region extends as far as Mangrol in the north, Jhalawar and Atru in the south and Kishanganj in the east and Anta in the west.

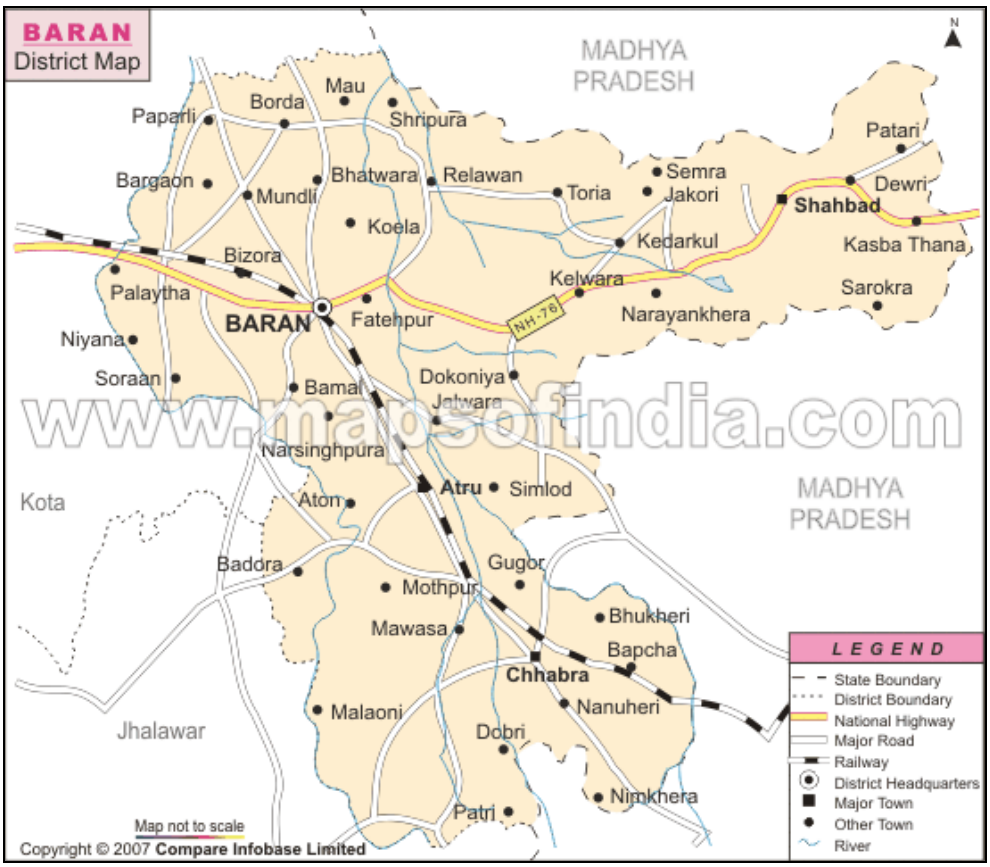


Figure 1: District Map of Baran

2. Topography, Drainage, and Natural Hazards

21. **Topography** The overall topography of Baran is plain. The type of soil is of Alluvial and black cotton. Hard rock is available at a depth varying from 3 to 10 feet below grade. The entire area of city is flat sloping towards Banganga River.

26. **Drainage** The city is on the bank of Banganga River, which flows to the North of the city and joins the river Parvan, a tributary of the river Chambal. The land slopes gently northward from the high table land of Malwa in MP. It is well watered, drained by rivers flowing in North and North-Eastern directions. There are hills in the south, north and eastern portion of the

district and it is gently fertile. There are hills in the east Shahabad Tehsil, having the highest point, named as Mamooni, which is 546 m above mean sea level. These hills are the part of Aravali Ranges

27. **Natural Hazards** Earthquake**:** Baran - Chhabra town lies in low damage risk zone II. The area is less prone to earthquakes as it is located on comparatively stable geological plains based on evaluation of the available earthquake zone information. **Figure 2** depicts the earthquake zones of Rajasthan.

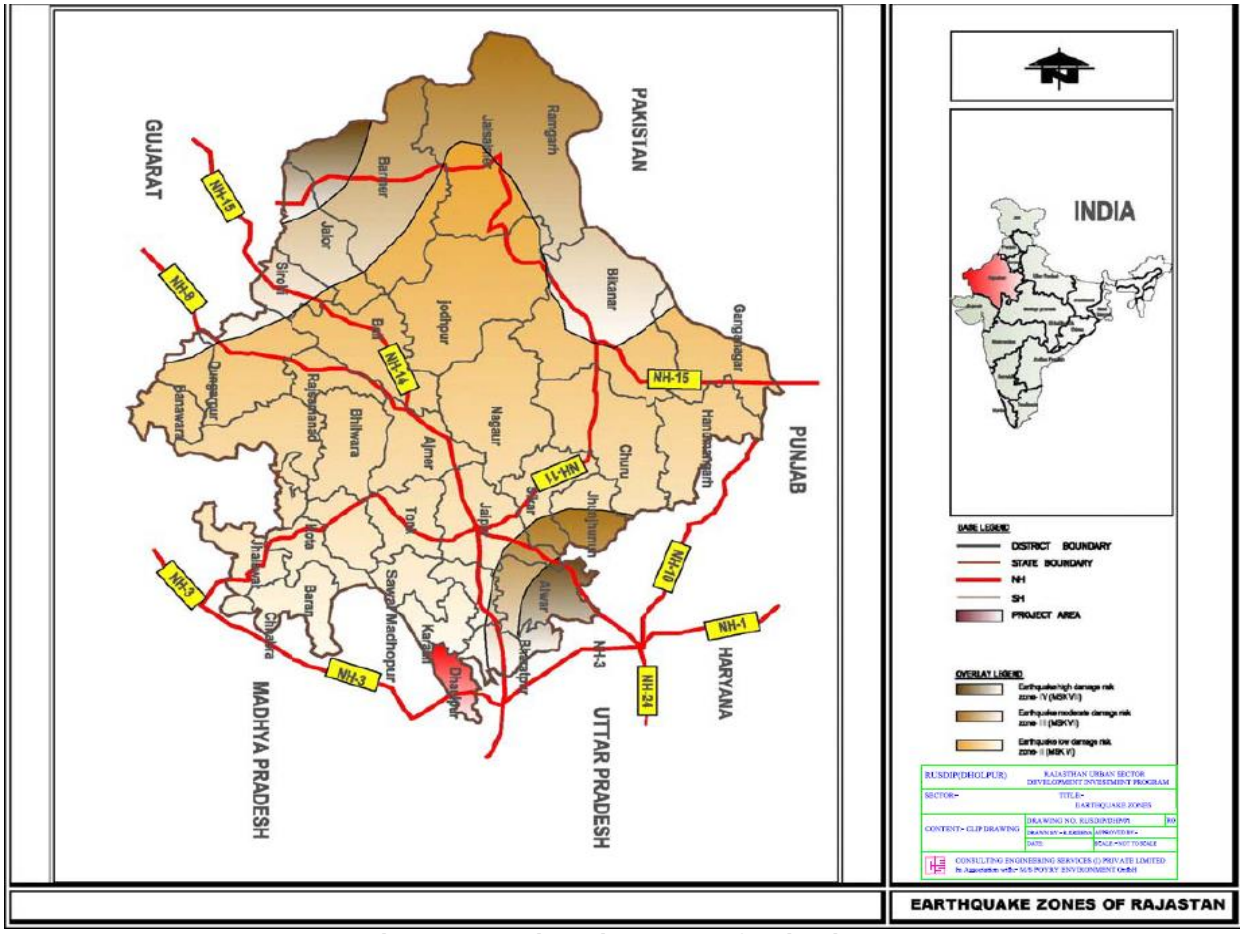


Figure 2: Earthquake zones of Rajasthan

3. Geology, Geomorphology, and Soils

28. **Geology** Major part of Baran district is occupied by Shale-Sandstone –limestone sequences belonging to the Vidhyan SuperGroup and the Deccan. The oldest rock type belonging to the Vindhyan Super Group .These are Classified in to the Rewa and Bhander Groups. This is conformably overlain by the Bhander Group comprising Ganurgarh Shale ,Bundi Hill. Of these the Bundi Hill Sandstone and the Sirbu Shale Formations in ascending order of succession. Younger alluvium is found along the present day flood plains of the rivers, supports extensive cultivation.

29. **Geomorphology** The district is geomorphologically classified into structural plain on upper proterozoic rocks, structural plain on Deccan Trap, alluvial plains and ravine lands.

30. **Mineral Resources Mineral** Resources: Baran district is endowed with bauxite, clay and building stone. Bauxite occurs near Majola. In Mamoni area reserves of 0.5 millions tonnes of bauxite averaging 49.54 % AO, 5 % SiO, 31.1 % FeO and 6.99 % TiO are found. The length and width of deposit are 1400 m and 450 m, respectively .The thickness varies from 3 to 15 m. The Vindhyan sandstones form good building stone which are sold under the trade name "Kota stone"

31. **Soil characteristics**: Soil of the region falls within low rainfall zone of 650- 1000 mm. The soils are black of alluvial origin, clay loam and groundwater salinity is reported. The nutrient status of the Baran soil is graded as medium to high level.

4. Climate

32. Like most of Rajasthan the climate of Baran and Jhalrapatan is mainly dry, with significant rainfall only during the monsoon season. Winter extends from November to March, and the coolest period occurs in January when daytime temperatures average around 25 °C and often fall below 10 °C at night. Temperatures begin to rise in March and peak in May-June, when daytime values sometimes reach 48 °C. The south-west monsoon arrives in June, causing a sudden drop in temperature and increase in humidity. The long-term average rainfall is 844 mm, of which over 90% falls in the monsoon period. The monsoon ends in mid-September and air temperatures rise briefly, only to fall again a few weeks later with the onset of winter. Winds are generally light and northerly or north-easterly in winter and moderate to strong from the west and south-west in the monsoon. The mean daily maximum temperature of Baran is 42.6 degrees Celsius. The mean daily minimum temperature is 29.7 degrees celsius. The area experiences a humid climate and the annual rain fall is 882 mm

5. Air Quality

222. Ambient air monitoring was conducted in Baran town under RUIDP projects at ROB site on dated 17-18 October 2012 and Heritage site (at Dolmela Talab) on dated 19-20 Oct. 2012 which will serve the purpose of getting air quality near the project roads as these two locations are within 0-3 Kms away from the proposed road projects. The Ambient air quality monitoring results are shown in the table 3 below-

Table 3: Ambient Air Quality of Baran

S.No.	Location	Date of monitoring	Monitoring results ($\mu g/m^3$)					Nearest proposed roads and approx. Aerial distance
			PM_{10}	$PM_{2.5}$	Sulphur Dioxide as SO_2	Oxides of Nitrogen as NO_2	CO	
1	Near FCI godown, Kota road	17.10.2012 (day-1)	105.93	54.85	8.56	14.9	290	- ROB to Charmurti Chowraha (200 mtrs) - Charmurti Chouraha to Pratap Chowk (800 mtrs) - Civil Lines to NH 27 (500 mtrs) Babji Nagar to NH27 (3.000 kms)
2		18.10.2012 (day-2)	211.71	81.45	9.75	15.53	360	

S.No.	Location	Date of monitoring	Monitoring results (µg/m³)					Nearest proposed roads and approx. Aerial distance
			PM_{10}	$PM_{2.5}$	Sulphur Dioxide as SO_2	Oxides of Nitrogen as NO_2	CO	
3	Dolmela Talab (near temple)	19.10.2012 (day 1)	129.36	84.42	8.02	16.89	320	- NH-76 to Ravan ji ka Chowk, Lanka colony (2.00 Kms)
4		20.10.2012 (day-2)	98.24	55.27	9.53	15.9	340	
National Ambient Air Quality Standards (NAAQS)			**100**	**60**	**80**	**80**	**4** mg/m³	

6. Noise level

Main source of noise is vehicle movement only as there are no industrial developments in Baran city. The noise level of Baran was monitored during 19-20 October 2012 within the different projects of RUIDP. The results of noise level monitoring are shown in table 4 below.

Table 4: Ambient Noise Quality of Baran

S.No.	Location	Date of monitoring	Monitoring results	Nearest proposed roads and approx. Aerial distance
1	Near FCI godown, Kota road	18.10.2012	$L_{day\ time}$=54.93 dB(A) $L_{night\ time}$= 47.39 dB(A)	- ROB to Charmurti Chowraha (200 mtrs) - Charmurti Chouraha to Pratap Chowk (800 mtrs) - Civil Lines to NH 27 (500 mtrs) Babji Nagar to NH27 (3.000 kms)
3	Dolmela Talab (near temple)	18.10.2012	$L_{day\ time}$=49.26 dB(A) $L_{night\ time}$= 44.90 dB(A)	- NH-76 to Ravan ji ka Chowk, Lanka colony (2.00 Kms)

7. Surface Water

33. Baran District receives the most rainfall in Rajasthan and is relatively well provided with surface water as a result. Major rivers of Baran are Kalisindh, Parvan, Parvati, Andheri and Banganga. All of the rivers and streams are part of the Chambal system, which is the only perennial river in the state. All of the rivers and streams are full and swiftly flowing in the monsoon, but most are dry throughout the rest of the year. There is no water quality monitoring station at Baran and Chhabra. It is expected that during monsoon season the water quality will be deteriorated by large volume suspended solid.

8. Groundwater

34. There are number of National Hydrographic monitoring stations of Central Ground Water Board in and around Baran. In most of the cases ground water table ranged between 2 - 10 m bgl.

35. Records of groundwater quality monitoring from Public Health Engineering Department (PHED) show groundwater quality in Baran town does not conform with the set norms of Government of Rajasthan. It has been noted that groundwater contains high level of total dissolved solids.

B. Ecological Resources

36. There are no protected areas, wetlands, mangroves, or estuarines in or within the subproject site. There is a Shergarh wildlife Sanctuary which is natural habitat of deers is about 50 kms away from the town. The flora and fauna commonly found in the district are-

37. **Flora** The forest covers an area of 2.17 lacs hectares of the district. This region or province or division in botanical terms, supports good teak forests which, however, been under heavy biotic pressure. Another dominant species is mahuwa whereas other common constituent species are sadad, baheda , dhonkra , dhav.

38. **Fauna** In Baran district, the wild animals found are striped hyaena (Hyaena), jackal (*Canis aureus*), baghera (*Panther pardus*), monkey (*Macaca mulatta*), common mongoose (*Herpestes edwardsii*), Indianfox (*Vulpes bengalensis*), blue bull(B*oselaphus tragocamelus*) etc Main birds found in the district are Bulbul, Sparrow, Peacock, Saras, Teetar etc.

C Economic Development

39. Baran, as a district head quarter, has a special administrative status and is a resourced rich region. It continues to be the main regional centre for trade and commerce and various socio-economic activities, since major portion of near by Tehsils are irrigated by Chambal Canal System which sourced at Kota and reached to Madhya Pradesh. The main economy of the town regulates by Agriculture and related activities.

1. Land Use

40. According to Baran Master Plant 2001 Baran Local Planning Area covers 12,500 acres of land. According to the Master Plan the main land use is residential (44.37%) and there are also relatively large areas of commercial (7.51%) industry (6.48%), public and semi public land (11.95%), transportation (11.60%) Government land (5.12%) and recreational land (12.97%)

2. Commerce, Industry and Agriculture

41. **Commerce** Baran is the district headquarters for Baran District and performs all administrative functions. Traditionally, Baran is a commercial town and the main occupation of the people is agriculture and commercial. The development and expansion of the town took place outside the old town when the Kota-Bina Railway line established in 1906. With the establishment of railway line, gradually different institutions and establishment inflow to the town. All these activities led to residential development to a considerable extend followed by commercial and agricultural. After the completion of 1st phase of Chambal project, the town further developed at a rapid face with facilities such as grain mandi, grain go-down, hospital, college, etc., featuring along the western limits of the old town.

42. Chhabra is agriculturally a productive area and therefore most of the earlier industries were agro based, but in the last two decades due to the industrial area development by RIICO, there has been a considerable diversification in the industrial base. The town still has a very good agricultural area in its hinter land. Grain Mandi of 'B' category and warehouse are situated hare. The occupation structure is also shown that majority (77.20%) of the working force is engaged in tertiary sector. Trade and commerce is the principal activity in this area during past few

decades. For various historical, traditional, economic reasons the existing central business area continues to function as most important centre for trade and commerce. The Irrigation Department has completed Hinglot Dam, and Lhasi Dam project is under construction. These projects are expected to further spur the growth of agriculture and industries. Recently a Thermal Power Plant has also been proposed in this region by the State Government at Motipura Chowki situated 20 km from the town. Such project also contributes to economic growth of the town and the region.

43. **Industries** District level data has been analyzed as pertinent information specific to Baran on the industrial units and worker is not available. Most of the business transaction, both wholesale and retail are still carried out in the markets of the old city and it has been graded as class A. recently the area of wholesale market has been extended to accommodate the proposed vegetable market. Presently timber and stone stock yards are found along the Nallah and mangrol road on the western periphery of the old town. There are no large scale industries in Baran except a rice mill located on the Atru road. There are few small scale industries like oil and rice mills are located in the existing developed area. There are about 386 medium and small scale industrial units in Baran. most of the industries are agro based (125), others are-textiles (16), forest based (22), paper (16), rubber and plastic based (13), chemical (10), mineral based (15), iron and steel based (66), repair and services (90) and others (15).

44. **Agriculture** In and around the Baran and Chhabra city area there are about 70-80% of lands used for agricultural purpose. Crop production statistics indicates much more crop production in Rabi season in compared to Kharif season. Type of crops are cereals, pulses, food grains, oilseeds and others. There are two main crops in the year viz. Rabi (in winter) and Kharif (in mansoon).

3. Infrastructure

45. **Water Supply** PHED supplies water to Baran town from River Parbati a perennial river at Baran. There are two more sources one is at Heekar Dev which is 15 km away from this town and another is at Majawatan Dev which is 16 km. Water produced at source is of 6.0 MLD and 1.0 MLD at Heekar Dev and Majawatan Dev respectively. From Heekar Dev, water transmitted is about 5.0 MLD and from Majawatan Dev, water transmitted is of about 0.8 MLD from source to the town by pumping. The PHED officials informed that the present transmission and distribution losses are of 25%. Presently, eleven (11) tube-wells tap ground water of 1.00 MLD for meeting the balance requirement. Per capita water supply based on the present stage supply is approximately 60 lpcd. The water supply of Chhabra town is completely depending up of ground water sources. Ground water is being tapped by means of open well and tube wells. The present daily demand of water is about 2.52 MLD and supply is about 1.55 MLD. As reported by the PHED officials, there are 22 nos. tube-well and 38 hand pumps out of which 35 hand pumps are working. It is also reported that the yield of tube wells is about 1.06 MLD (based on pumping of 4.0 hours per day, yield of each-well @ 200 LPM).

46. **Sewerage** At present there is no under ground sewerage system in Baran and Chhabra. Majority of house hold (72% for Baran and 85% for Chhabra) are having individual septic tank. Open drains meant for storm water carry wastewater (mainly sludge and in few cases sewage too) from individual households. The storm water drain discharges into natural streams that ultimately join Parbati River in Baran. The untreated wastewater of Baran ultimately joins the River Parbati, 15 km away of Baran. There is no sewage treatment facility in both the towns.

47. **Sanitation** A predominant proportion of city households depend on individual sanitation facilities (and illegal connections opening into drains). It is estimated that approximately 72 percent and 85 % of houses (assessed properties) have access to individual sanitation facilities − either septic tanks or pit latrines, within their premises for Baran and Chhabra respectively. Others use the community toilets provided by the Municipal Boards and significant population also resort to open defecation. Most of the domestic sewage for the city is either discharged at open places through surface drains or through local soak-pits.

48. **Drainage** Presently Baran has a minimal storm water drain exists in the town. As reported by the Municipality Board, Baran covered with 90 km of drain and the overall topography slopes from north to east direction. With the exception of the old town areas, newly developed areas are reported situated at relatively low grade levels which essentially translate in to 'depression' effect, wherein the central portion of the town is at a lower level than the adjoining areas which is also from adjoining areas which also from catchments zone. A numbers of drains/rivers such as Patheda Nallah, Forest Nallah, Ramnagar Nallah, Nalka Nallah, and the Banganga River flow through Baran. The total length of Banganga River is 65- km and the catchments area within the Baran town is about 48.12 sq.km.

49. **Industrial Effluents** Small industries exists in under RIICO, which is out side the city area and small amount of effluent disposed scattered in local nallahs. As reported by the local MC, the responsibility of effluent disposal is under RIICO's own and could not be connected to the proposed sewer network. The individual industry should treat their effluent to bring it to the required standard before final disposal

50. **Solid Waste** Baran City generates approximately 40-42 MT of municipal solid waste every day comprising of both the biodegradable and non biodegradable components. The entire solid waste management of Baran city is managed by the BMB headed by the Chief Sanitary Inspector supported by 123 sweepers for the collection of waste from bins and street sweeping. Presently, a systematic and scientific system of primary collection of waste is practically non-existent and is yet to be developed. Most of the citizens merely dump the wastes in nearby open drains/bins or open space available adding to the piling up of waste along road sides and clogging of drains. Therefore, there is an imminent requirement to mobilize community participation, design and develop an appropriate system of primary collection of waste and synchronize the same with storage at source as well as waste storage depot facilities, ensuring that the waste once collected reaches the processing or disposal site through an effective transportation system without multiple handling. There are 19 nos. bins located in different areas of the town and those are used as waste storage. BMB has adopted open transport of wastes from temporary points to the dumping site and the waste is being collected from these points and loaded on to the tractor trailer manually. There are 2 tractor tailors and one mini truck under BMB for transpiration of waste. Presently, solid waste is transported and disposed without any treatment on either side of the roads and barren agriculture land i.e. near doll talab shramik colony, near Motor Market Shahabad road N.H. – 76 and behind ITI building Jhalawar road.

51. **Transportation** Baran comprises a road network of 125.6 km, consisting of 57.6 km bituminous roads, earthen road is of 33.0 km and 35 km cement concrete roads. Only 32.6 km road network is maintained by PWD, which is 26 percent of road length. All remaining roads are maintained by the municipal boards. In the recent past, both municipal boards have invested substantially in upgrading roads to cement concrete roads. The condition of the roads is generally poor, and many are in need of repairs and resurfacing

D. Social and Cultural Resources

52. **Demography** According to Census 2001 the population of Baran district was 1021653 and spreads over an area of 6992 sq. Km. Out of which urban population was 172015 (16.84%) and rural population was 849638 (83.16%). The average density in the district is 147 persons per sq. km. The district has recorded a growth rate of 26.08% percent during the last decade (1991-2001).

53. **Health and Educational Facilities** At the district headquarter Baran has "B" grade district hospital, one maternity and child welfare centre, 3 dispensaries and 4 urban family welfare centres. There are 47 dispensaries/hospitals in the district.

54. There are good educational facilities in Baran district, which serve both townspeople and inhabitants of surrounding villages and towns in the hinterland. There are 930 primary schools, 102 secondary and higher secondary schools, 2 general degree colleges and 3 industrial training institutes (ITI).

55. **History, Culture and Tourism** Baran city was under Solanki Rajputs in the 14th -15th century. It is not exactly known that when the main town of the twelve villages under Solanki's was being named as 'Baran'. In the year 1948, joint Rajasthan was formed and that time Baran was one of the districts in the joint Rajasthan. On 31st March' 1949, Rajasthan was reconstituted and that time Baran district headquarters was converted into Sub Division headquater of Kota district. It is also worth noting that 'Baran' in urdu means rain and no wonder that Baran has the second highest rainfall in the state after Banswara district.

56. Baran is a city carved out of Kota is situated further into Hadoti region of Rajasthan State. The region is less crowded and attracts a large number of domestic and international tourists. In the interiors of the city one can get chance to visit ruined temples, and an abandoned fortress. There are wooded hill and valley which provide shelter to a larger variety of wildlife. The city is rich in culture and heritage and has potential to become an excellent tourist destination with good facilities for the tourists visiting the city. The main religious and tourist places in Baran are- Sitabari (45 Kms), Kanyadeh (Bilaspur, 45 Kms), Brahmani Mataji (Sorsan, 20 Kms), Shahabad Fort (80 Kms), Shahi Jama Masjid (Shahabad, 80 Kms), Manihara Mahadeo Temple (3 Kms), Shergarh Fort and Shergarh Wild Life Sanctuary (Shergarh, 65 Kms) etc. Besides these there are many popular festivals like Dolmela festival (in the sub project Dolmela Talab), Sitabari Fair and Phuldol Folk Festival which attracts Lakhs of visitors every year, from Baran as well as adjacent cities and Madhya Pradesh.

IV. ANTICIPATED ENVIRONMENTAL IMPACTS AND MITIGATION

57. This section of the IEE reviews possible subproject-related impacts, in order to identify issues requiring further attention and screen out issues of no relevance. ADB SPS (2009) require that impacts and risks will be analyzed during pre-construction, construction, and operational stages in the context of the subproject's area of influence. As defined previously, the primary impact areas are (i) the sites for construction of roads (ii) main routes/intersections which will be traversed by construction vehicles; and (iii) quarries and borrow pits as sources of construction materials (iv) operation of construction plants and machineries. The secondary impact areas are: (i) entire Baran area outside of the delineated primary impact area; and (ii) entire Baran district in terms of over-all environmental improvement.

58. The ADB Rapid Environmental Assessment Checklist for Roads and Highways was used to screen the subproject for environmental impacts and to determine the scope of the IEE investigation. The completed Checklist is found in **Appendix 1**. All the proposed subproject components will interact physically with the environment.

59. In the case of this subproject (i) most of the individual elements are relatively small and involve straightforward construction and operation, so impacts will be mainly localized and not greatly significant; (ii) most of the predicted impacts are associated with the construction process, and are produced because that process is invasive, involving excavation and earth movements; and (iii) being located in the built-up area of Baran, will not cause direct impact on biodiversity values. The subproject will be in properties held by the local self government and access to the subproject area is thru public rights-of-way and existing roads hence, land acquisition and encroachment on private property will not occur.

A. PRE-CONSTRUCTION – LOCATION AND DESIGN

60. **Environmentally-sensitive areas** Location impacts are not significant as there are no environmentally sensitive areas within the subproject area. A few trees may be affected or to be cut and vegetation (mostly shrubs and grasses) will be cleared in this road subproject. Prior to construction, the Design and Supervision Consultants (DSC) in close coordination with the Baran Investment Project Implementation Unit (IPIU) will (i) make inventory of the trees to be cut; (ii) obtain tree-cutting permit from BMB and/or District Collector; and (iii) include in the bid documents provisions on re plantation of 3 trees for every one tree cut during construction.

61. **Utilities** Telephone lines, electric poles and wires, water and sewer lines within the existing right-of-way (ROW) may be damaged and needed to be shifted prior to start of works. To mitigate the adverse impacts due to relocation of the utilities, DSC will (i) identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; (ii) PIU will require to co-ordinate with concerned departments in advance for shifting/relocate these utilities prior to start of the work and (III) require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.

62. **Existing Roads** Area of land required for widening is included in the plan drawings. Affected communities will be consulted prior to finalizing any subproject lay-out and design and they will be informed well in advance before the start of the work about nature of disturbance and duration of impact.

63. **Social and Cultural Resources** Baran is an area of rich and varied cultural heritage which includes a large numbers of temples and other religious sites, so there is a risk that any work involving ground disturbance can uncover and damage archaeological and historical remains. For this subproject, excavation will occur in and around existing road ROWs, so it could be that there is a low risk of such impacts. Nevertheless, IPIU will:

(i) Consider alternatives if the site is found to be of medium or high risk;
(ii) Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available; and
(iii) Develop a protocol for use by the construction contractors in conducting any excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved.
(iv) Advance plans should be prepared so that religious and cultural sites should not be disturbed and their regular activities should not be affected due to construction works

64. **Site selection of construction work camps, hot mix plant, stockpile areas, storage areas, and disposal areas** Priority is to locate these near the project area. However, if it is deemed necessary to locate elsewhere, sites to be considered will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems. Residential areas will not be considered to protect the human environment (i.e., to curb accident risks, health risks due to air and water pollution and dust, and noise, and to prevent social conflicts, shortages of amenities, and crime). Extreme care will be taken to avoid disposals near the sanctuaries, tiger reserves, wetlands, swamps, or in areas which will inconvenience the community. All locations would be included in the design specifications and on plan drawings.

65. **Site selection of sources of materials** Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water pollution. To mitigate the potential environmental impacts, locations of quarry site/s and borrow pit/s (for loose material other than stones) would be included in the design specifications and on plan drawings. Priority would be sites already permitted by Mining Department. If other sites are necessary, these would to be located away from population centres, drinking water intakes and streams, cultivable lands, and natural drainage systems; and in structurally stable areas even if some distance from construction activities. It will be the construction contractor's responsibility to verify the suitability of all material sources and to obtain the approval of Urban Local Body/concerned Government Department. If additional quarries will be required after construction is started, then the construction contractor shall use the mentioned criteria to select new quarry sites, with written approval of IPIU.

66. **Tree cutting** There is requirement to cut total 7 nos of trees in proposed road project out of which 2 trees are proposed to cut in Lanka Colony road and 5 in Charmurti Chouraha to ROB road for which prior permission from concerned authority is required. Compensatory plantation in ratio of 1:3 for cut trees is also required.

B. Construction

1. Screening out areas of No Significant Impacts

67. From the descriptions given in Section II.D, it is clear that implementation of the subproject should not have major negative impacts because it will affect only existing road sites, at which all construction will be conducted within available ROW.

68. Because of this there are several aspects of the environment that are not expected to be affected by the construction process and these can be screened out of the assessment at this stage as required by ADB procedure. These are shown in **Table 4.1**, with an explanation of the reasoning in each case

Table 4.1: Fields in which construction is not expected to have significant impacts

Field	Rationale
Topography, Drainage, and Natural Hazards	Activities are not large enough to affect these features.
Geology, Geomorphology, Mineral Resources, and Soils	Activities are not large enough to affect these features. No mineral resources in the subproject sites.
Climate	Activities are not large enough to affect this feature.
Protected Areas	No any protected areas near the sub project site
Flora and Fauna	No rare or endangered species found near the sub project site.
Economic Development	Activities are not large enough to permanently affect this feature.
Land Use	No change in land use.
Commerce, Industry, and Agriculture	Activities are not large enough to affect these features, only some short term effect on trade and commerce, which is analysed in SRP
Population	Activities are not large enough to affect this feature.
Historical, Archaeological, Paleontological, or Architectural sites	No scheduled or unscheduled historical, archaeological, paleontological, or architectural sites within or near the subproject site

69. These environmental factors have thus been screened out presently but will be assessed again before implementation and during construction and be revised if found necessary.

2. Construction method

70. As explained above, this subproject will involve widening and strengthening of 5 different existing roads of Baran city.

71. Road construction is generally started with Clearing and Grubbing of the area of construction. Thereafter Survey work will be carried out including fixing of TBM. After survey earthwork will be done including items like excavation, cutting, loosening & re-compacting, filling vide embankment /sub grade. Then Sub base will be prepared i.e. Granular sub base / Drainage layer. Thereafter Base course will be prepared i.e. Wet Mix Macadam /Water Bound Macadam. Dense Bituminous Macadam and finally wearing course will be laid. Then finally road marking, road signage, road furniture is fixed. The salient details of works to be undertaken in the subproject are given in section II B&D.

72. The operation will be conducted by a team of around 25-30 persons, roughly 50% unskilled labour and 50% with various skills including truck drivers, vehicle and machine operatives, surveyors, foremen and supervisors, etc. The operation should be completed in around 12months.

3. Anticipated Environmental Impacts and Mitigation Measures

73. Although all work will be conducted at a single, relatively small site, construction will involve a great deal of excavation and earth moving over a period of approximately 15-30 days for each road. However these physical environmental impacts are generic construction-related impacts associated with (i) road construction and (ii) removal and relocation of utility lines. These impacts are not expected to be significant and permanent, and can be managed through adoption of good engineering practices and undertaking specific mitigation measures.

74. **Sources of Materials** Significant amount of gravel, sand, and cement will be required for this subproject. The construction contractor will be required to:

(i) Use quarry sites and sources permitted by the Government;
(ii) Verify suitability of all material sources and obtain approval of Investment Program Implementation Unit (IPIU);
(iii) If additional quarries will be required after construction has started, obtain written approval from IPIU; and
(iv) Submit to IPIU/DSC on a monthly basis documentation of sources of materials

73. **Air Quality** Emissions from construction vehicles, equipment, and machinery used for excavation and road construction will induce impacts on the air quality in the construction sites as well on the road users (pedestrians and vehicles). Anticipated impacts include dusts and increase in concentration of vehicle-related pollutants such as carbon monoxide, sulphur oxides, particulate matter, nitrous oxides, and hydrocarbons) but temporary and during construction activities only. To mitigate the impacts, construction contractors will be required to:

(i) Consult with IPIU/DSC on the designated areas for stockpiling of clay, soils, gravel, and other construction materials;
(i) Excavation should be done at that time so that dug material is used immediately, avoiding the need to stockpile on site;
(ii) Damp down exposed soil and any stockpiled on site by spraying with water when necessary during dry weather;
(iii) Use tarpaulins to cover sand and other loose material when transported by trucks; and
(iv) Fit all heavy equipment and machinery with air pollution control devices which are operating correctly which will be ensured by Pollution Under Control (PUC) certificated for all the construction equipments and vehicles

74. **Surface Water Quality** Construction activities may result mobilization of settled silt materials, run-off from stockpiled materials, and chemical contamination from fuels and lubricants during construction works, which may contaminate downstream surface water quality of nearby drains, nallahs, ponds and lakes of the town. These potential impacts are temporary and short-term duration only and to ensure these are mitigated, construction contractor will be required to:

(ii) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
(iii) Prioritize re-use of excess soils and materials in the construction works. If soils will be disposed, consult with IPIU/DSC on designated disposal areas;
(iv) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
(v) Place storage areas for fuels and lubricants away from any drainage leading to

water bodies;
(vi) Dispose any wastes generated by construction activities in designated sites; and
(vii) Conduct surface quality inspection according to the Environmental Management Plan (EMP).

75. **Noise Levels** There are no adjacent paleontological, historical, archaeological or architectural sites near the construction sites. The sensitive receptors are some educational facilities, road users, general public and visitors of Baran. Increase in noise level may be caused by earth-moving and excavation equipment, and the transportation of equipment, materials, and people. Impact is negative, short-term, and reversible by mitigation measures. The construction contractor will be required to:

(i) Plan activities in consultation with IPIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;
(ii) Require horns not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
(iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers to reduce sound impact to surrounding sensitive receptor; and
(iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s.

76. **Existing Infrastructure and Facilities** Telephone lines, electric poles and wires, water and sewer lines within the existing road ROW will be removed/shifted thus there is anticipated disruption of service during construction. Excavation could however damage existing infrastructure located alongside roads, in particular water supply pipes and sewer lines. It will be particularly important to avoid damaging existing water pipes as these are mainly manufactured from Asbestos Cement (AC), which can be carcinogenic if inhaled, so there are serious health risks for both workers and the public. It is therefore important that construction contractors will be required to:

(i) Obtain from IPIU and/or DSC the list of affected utilities and operators;
(ii) Prepare a contingency plan to include actions to be done in case of unintentional interruption of services. and
(iii) Develop and implement an Asbestos Cement Pipes Management Plan

77. **Flora and Fauna** There are no protected areas in or within the subproject sites. Few trees and shrubs are the vegetation noted in the area, which may be affected due to construction activities. A total of 7 no. of trees are required to be cut for which permission from concerned authority is required, which is liability of IPIU and compensatory plantation as per RUIDP guideline in the ration of 1:3 is also required, which is liability of contractor. Land-clearing activities and presence of workers in the sites can damage or cause loss of existing flora. Potential impacts are negative but reversible by mitigation measures. The construction contractors will be required to:

(i) Minimize removal of vegetation and disallow cutting of trees if not required for the construction activities;
(ii) Where tree removal will be required, obtain tree-cutting permit from the Municipal Board or District Collector;
(iii) Earth-ball trees and transplant to IPIU-approved areas;

(iv) Require to plant three native trees for every one that is removed; and
(v) Prohibit employees from cutting of trees for firewood.

78. **Landscape and Aesthetics** The construction activities will produce solid wastes as well as excess construction materials. Such waste could include removed concrete, packaging material, empty containers, spoiled soil, sludge, oils, lubricants, paints, chemicals, worn-out spares, remnants of construction materials, and other similar items. These impacts are negative but short-term and reversible by mitigation measures. The construction contractor will be required to:

(i) Prepare and implement Waste Management Plan;
(ii) Recover used oil and lubricants and reuse or remove from the sites;
(iii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
(iv) Remove all wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and
(v) Request IPIU/DSC to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

79. **Transportation – Accessibility** Hauling of construction materials and operation of equipment on-site can cause traffic problems and conflicts in ROW. Potential impact is negative but short term and reversible by mitigation measures. The construction contractor will be required to:

(i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
(ii) Schedule transport and hauling activities during non-peak hours;
(iii) Locate entry and exit points in areas where there is low potential for traffic congestion;
(iv) Keep the site free from all unnecessary obstructions;
(v) Drive vehicles in a considerate manner;
(vi) Coordinate with Baran Traffic Office for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours; and
(vii) Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.

80. **Socio-Economic** Manpower will be required during the whole period of construction stage. This can result to generation of contractual employment and increase in local revenue. Thus potential impact is positive and long-term. The construction contractor will be required to:

(i) Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; and
(ii) Procure construction materials from local market.

231. **Occupational Health and Safety** Workers need to be mindful of the occupational hazards which can arise from working in infrastructures like roads and roads. Potential impacts are negative and long-term but reversible by mitigation measures. The construction contractor will be required to:

(i) Develop and implement site-specific Health and Safety (H&S) Plan which will

include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment; (c) H&S Training[2] for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;

(ii) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;
(iii) Provide medical insurance coverage for workers;
(iv) Secure all installations from unauthorized intrusion and accident risks;
(v) Provide supplies of potable drinking water;
(vi) Provide clean eating areas where workers are not exposed to hazardous or noxious substances;
(vii) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective equipments, and preventing injuring to fellow workers;
(viii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
(ix) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
(x) Ensure moving equipment is outfitted with audible back-up alarms;
(xi) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and
(xii) Disallow worker exposure to noise level greater than 85 dBA for duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

82. **Community Health and Safety** Hazards posed to the public; specifically in high-pedestrian areas (such as the busy road) may include traffic accidents and vehicle collision with pedestrians. Potential impact is negative but short-term and reversible by mitigation measures. The construction contractor will be required to:

(i) Plan routes to avoid times of peak-pedestrian activities.
(ii) Liaise with IPIU/DSC in identifying high-risk areas on route cards/maps.
(iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.
(iv) Provide road signs and flag persons to warn of dangerous conditions.

83. **Work Camps** Operation of work camps can cause temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and

[2] Some of the key areas that may be covered during training as they relate to the primary causes of accidents include (i) slips, trips and falls; (ii) personal protective equipment; (iii) ergonomics, repetitive motion, and manual handling; (iv) workplace transport; and (v) legislation and responsibilities. Training can provide the foundations of competence but it does not necessarily result in a competent worker. Therefore, it is essential to assess staff competence to ensure that the training provided is relevant and effective. Supervision and monitoring arrangements shall be in place to ensure that training has been effective and the worker is competent at their job. The level of supervision and monitoring required is a management decision that shall be based on the risks associated with the job, the level of competence required, the experience of the individual and whether the worker works as part of a team or is a lone worker.

lubricants. Potential impacts are negative but short-term and reversible by mitigation measures. The construction contractor will be required to:

(i) Consult with IPIU/DSC before locating project offices, sheds, and construction plants;
(ii) Minimize removal of vegetation and disallow cutting of trees;
(iii) Provide water and sanitation facilities for employees;
(iv) Train employees in the storage and handling of materials which can potentially cause soil contamination;
(v) Recover used oil and lubricants and reuse or remove from the site;
(vi) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
(vii) Remove all wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and
(viii) Request IPIU/DSC to report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

84. **Social and Cultural Resources** For this subproject, excavation will occur in and around existing road ROWs, so it could be that there is a low risk of such impacts. Nevertheless, the construction contractor will be required to:

- Strictly follow the protocol for chance finds in any excavation work;
- Request IPIU/DSC or any authorized person with archaeological field training to observe excavation;
- Stop work immediately to allow further investigation if any finds are suspected; and
- Inform IPIU/DSC if a find is suspected, and take any action they require ensuring its removal or protection in situ.

85. Most of the subproject roads are having inhabitations, markets, religious places and public utilities, so action should be taken to minimise disturbance as far as possible. This will require:

- Consultation with the local community to inform them of the nature, duration and likely effects of the construction work, and to identify any local concerns so that these can be addressed;
- Involving the community in planning the work programme so that any particularly noisy or otherwise invasive activities can be scheduled to avoid sensitive times;
- Avoiding conducting noise-generating activities at night;
- Implementing the measures described in EMP to reduce dust;
- Utilising modern vehicles and machinery with the requisite adaptations to limit noise and exhaust emissions, and ensuring that these are maintained to manufacturers' specifications at all times.
- Contractor in close co-ordination of IPIU should ensure that any cultural and religious places and educational facilities should not be disturbed and their routine works should be allowed to go without disturbance. While working near to schools, the school timings should be avoided for noisy and dusty activities. Likewise while working near to religious places, no disturbance should be done for the movement of devotees. Important dates of any special celebrations/offerings should be kept in mind and avoided for heavy works. Proper mitigation measures should be prepared for the purpose.

86. There is invariably a safety risk when substantial construction such as this is conducted in an urban area, and precautions will thus be needed to ensure the safety of both workers and

citizens. The Contractor will be required to produce and implement a site Health and Safety Plan, and this should include such measures as:

- Excluding the public from the site;
- Ensuring that all workers are provided with and use appropriate Personal Protective Equipment;
- Health and Safety Training for all site personnel;
- Documented procedures to be followed for all site activities;
- Accident reports and records; Etc.

C. Operation and Maintenance

87. O&M of the roads will be the responsibility of the Baran Municipal Board (BMB). The roads have a design life of 15 years, during which it shall require periodical repairs or refurbishments. The stability and integrity of the roads will be monitored periodically to detect any problems and allow remedial action if required. Routine maintenance will include:

- Small scale *ad hoc* repairs of surface damage caused by traffic use or accidents;
- Repairs and replacement of damaged safety barriers and signs; and
- Regular unblocking of drains to prevent damage from flooding in the monsoon.

1. Screening out areas of no significant impact

88. Because roads generally operate with the need for regular repair and maintenance (see below), there are several environmental factors that should be unaffected once the constructed roads begin to function. These are identified in **Table 4.2** below, with an explanation of the reasoning in each case. These factors are thus screened out of the impact assessment and will not be mentioned further.

Table 4.2: Fields in which operation and maintenance of the completed road improvement is not expected to have significant impacts

Field	Rationale
Topography, Drainage, and Natural Hazards	Activities are not large enough to affect these features.
Geology, Geomorphology, Mineral Resources, and Soils	Activities are not large enough to affect these features. No mineral resources in the subproject sites.
Climate	Activities are not large enough to affect this feature.
Geohydrology and Groundwater	Activities will not be large enough to affect these features
Protected Areas	Subproject sites are not located near protected areas
Flora and Fauna	No rare or endangered species.
Land Use	No change in land use.
Commerce, Industry, and Agriculture	Activities are not large enough to affect these features
Population	Activities are not large enough to affect this feature.
Paleontological, or Architectural sites	No paleontological or architectural sites near the subproject sites

2. Anticipated Impacts and Mitigation Measures

89. **Air Quality** Once the roads are completed and operating it will improve the physical environment by removing the current severe traffic congestion in the areas. This will indirectly result to less air pollution in the area. The potential impact is positive and long-term.

90. **Noise Level** As expected of any road/bridge infrastructures, noise levels tend to increase with vehicular traffic. To mitigate this impact, BMB will put signages and implement “no blowing of horns” zones where there are sensitive receptors (such as the Hospital).

91. **Accessibility** Portions of the roads may be affected during routine repairs. However, the works will be very small in scale, and will be conducted manually by small teams of men with simple equipment (shovels, wheelbarrows, tarmac blender, etc.). Even if larger vehicles will be used to refurbish larger portions of the roadways, the work will be very short in duration. The potential impacts are negative although will not cause significant physical impacts. To maintain the safety of workers and road-users, BMB will coordinate with the Municipal Traffic Police Department so that warning signs and traffic diversions can be set up when necessary.

92. **Ecological Resources** As there are no significant ecological resources in or around the town, the operation of the roads and the routine maintenance and repair of the road and surroundings will have no ecological impacts. In fact by planting trees near the roads, there would be some small ecological gain to mask the visual impact of the structure.

93. **Economic Development** The roads will improve the infrastructure of the town by providing a more efficient and effective transportation route, and this should have positive impacts on the overall economy by reducing time spent idle in stationary traffic by delivery vehicles, employees and customers. It may also make further positive contributions to the development of particular sectors, for example by making the area more attractive to tourists and allowing the more efficient transportation of agricultural produce and other goods to and from the town.

94. **Social and Cultural Resources** Effects of the operating roads on social and cultural resources in the town will be relatively small in scale and intangible in nature, and are thus difficult to assess and quantify.

95. The citizens of the town will benefit from a more effective transportation route as they will spend less time in stationary traffic exposed to noise, pollution and the associated physical and psychological stresses. Since people commuting on these roads will save time, they will socially much better off then before. People may also benefit from an improvement in the economy of the town, although it would require much larger improvements in transportation and other infrastructure for this to be recordable.

96. Repairs to the road will not be physically invasive so there will be no risk to historical remains, and as there are no areas or resources of social or cultural importance in the vicinity there will be no risk to such features.

V. PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

A. Project stakeholders

97. The primary stakeholders are:

(i) Residents, shopkeepers and businesspeople who live and work alongside the roads in which improvements will be provided and near sites where facilities will be built;
(ii) Custodians and users of socially and culturally important buildings in affected areas like schools, temples etc.
(iii) State and local authorities responsible for the protection and conservation of archaeological relics, historical sites and artefacts; and
(iv) State and local tourism authorities.

98. The Secondary stakeholders are:

(i) LSGD as the Executing Agency;
(ii) Other government institutions whose remit includes areas or issues affected by the subproject (state and local planning authorities such as Public Health Engineering Department, Local Government Department, Ministry of Environment and Forests, Roads and Highways Division);
(iii) Non-government organizations (NGOs) and community-based organizations (CBOs) working in the affected communities;
(iv) Other community representatives (prominent citizens, religious leaders, elders, women's groups);
(v) The beneficiary community in general; and
(vi) ADB, GoI, and Ministry of Finance.

B. Consultations and Disclosures to date

99. Some informal discussion was held with the local people during site visit. Issues discussed are:

(i) Awareness and extent of the project and development components;
(ii) Benefits of Project for the economic and social upliftment of community;
(iii) Labour availability in the Project area or requirement of outside labour involvement;
(iv) Local disturbances due to Project Construction Work;
(v) Necessity of tree felling etc. at project sites;
(vi) Water logging and drainage problem if any;
(vii) Drinking water problem;
(viii) Forest and sensitive area nearby the project site; and
(ix) Movement of wild animals nearby the project site.

100. The City Level Committee (CLC) meeting was conducted by RUIDP on Date 12 April 2013 under the chairmanship of District Collector of Baran for discussions and approval of the proposed road works in Baran. In the specific context of Baran, the environmental and social impacts of the proposed subprojects under Tranche 2 and 3 in Baran were discussed.

101. Public consultation was also carried out at proposed subproject roads during design phase. Records of public consultations are attached as **Appendix 2** and photographs are attached as **Appendix 5**. The major issues raised are related to traffic interferences and possible dust and noise problems during construction phase. Other comments include construction vehicles creating some disturbances to the local people daily activities, necessity of proper safety arrangements, and widening of roads prior to construction activities. The issues and comments have been considered and incorporated in the design of the subproject and mitigation measures for the potential environmental impacts raised during the public consultations.

102. Informal discussions were held with the local people during site visits for the preparation of this IEE. Issues discussed were:

(i) Proposed Roads improvement project should ensure to improve the traffic condition of town;
(ii) Executive agency should give preference to engage reputed contractors as people do not faith about the local contractors in respect of quality of works as well as timely completion of work;
(iii) Efforts should be made by government to maintain the road in good conditions all the time
(iv) Livelihood affected households should be given assistance in the mode of cash compensation;
(v) Local people should be employed by the contractor during construction work;
(vi) Adequate safety measures should be taken during construction work;
(vii) Mobile kiosks/vendors/hawkers have shown willingness to shift their temporary shops/ movable shops/business in nearby places without taking any compensation and assistance from the Executing Agency; and
(iii) Local people have appreciated the proposed road works of the government and they have ensured that they will cooperate with the Executing Agency during project implementation.

24. Hindi versions of the Environmental Framework will be provided during consultations to ensure stakeholders understood the objectives, policy, principles, and procedures. Likewise, English and Hindi versions of the IEE report will be placed in prominent Urban Local Body (ULB)/Government offices, Investment Program Project Management Unit (IPMU), IPIU office, and the town library.

C. Future Consultation and Disclosure

25. LSGD extended and expanded the consultation and disclosure process significantly during implementation of RUSDIP. They have appointed an experienced NGO to handle this key aspect of the programme. The NGO (Community Awareness and Participation Program, CAPP) continuously (i) conducts a wide range of activities in relation to all subprojects in each town; and (ii) ensures the needs and concerns of stakeholders are registered and are addressed in subproject design.

105. For this subproject, the CAPP consultant will develop, in close coordination with IPIU and DSC, a public consultation and disclosure program which is likely to include the following:

(i) **Consultation during detailed design:**

(a) Focus-group discussions with affected persons and other stakeholders (including women's groups, NGOs and CBOs) to hear their views and concerns, so that these can be addressed in subproject design where necessary; and
(b) Structured consultation meetings with the institutional stakeholders (government bodies and NGOs) to discuss and approve key aspects of the project.

(ii) **Consultation during construction:**

(a) Public meetings with affected communities to discuss and plan work programmes and allow issues to be raised and addressed once construction has started; and
(b) Smaller-scale meetings to discuss and plan construction work with individual communities to reduce disturbance and other impacts, and provide a mechanism through which stakeholders can participate in subproject monitoring and evaluation;

(iii) **Project disclosure:**

(a) Public information campaigns (via newspaper, TV and radio) to explain the project to the wider town population and prepare them for disruption they may experience once the construction programme is underway;
(b) Public disclosure meetings at key project stages to inform the public of progress and future plans, and to provide copies of summary documents in Hindi; and
(c) Formal disclosure of completed project reports by making copies available at convenient locations in the study towns, informing the public of their availability, and providing a mechanism through which comments can be made.

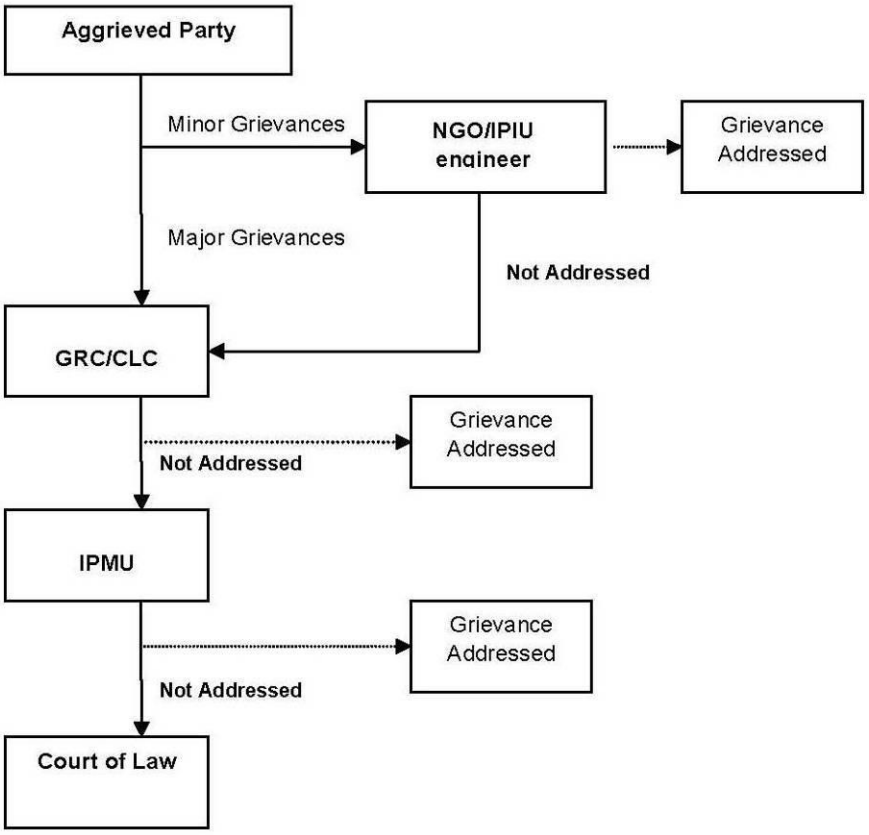
106. Based on ADB requirements, the following will be posted on ADB website: (i) this IEE, upon receipt; (ii) a new or updated IEE, if prepared, reflecting significant changes in the Project during design or implementation; (iii) corrective action plan prepared during Project implementation to address unanticipated environmental impacts and to rectify non-compliance to EMP provisions; and (iv) environmental monitoring reports, upon receipt.

VI. GRIEVANCE REDRESS MECHANISM

267. Grievances of affected persons will first be brought to the attention of the implementing NGO or IPIU engineer. Grievances not redressed by the NGO or IPIU will be brought to the City Level Committees (CLC) set up to monitor project implementation in each town. The CLC, acting as a grievance redress committee (GRC) is chaired by the District Collector with representatives from the ULB, state government agencies, IPIU, community-based organizations (CBOs) and non-government organizations (NGOs). As GRC, the CLC will meet every month. The GRC will determine the merit of each grievance, and resolve grievances within a month of receiving the complaint, failing which the grievance will be addressed by the inter-ministerial Empowered Committee. The Committee will be chaired by the Minister of Urban Development and LSGD, and members will include Ministers, Directors and/or representatives of other relevant Government Ministries and Departments. Grievance not redressed by the GRC will be referred to the IPMU for action; failure at this level will be referred to the appropriate courts of law. The IPIU 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 grievance redress process is shown in Figure 2.

108. All costs involved in resolving the complaints will be borne by the IPMU. The GRCs will continue to function throughout the project duration.

Figure 2: Grievance Redress Mechanism – RUSDIP



CLC = City Level Committee, GRC = Grievance Redress Committee, IPIU=Investment Program Implementation Unit, IPMU = Investment Progarm Management Unit, NGO = nongovernmental organization,

VII. ENVIRONMENTAL MANAGEMENT PLAN

A. Institutional Arrangements

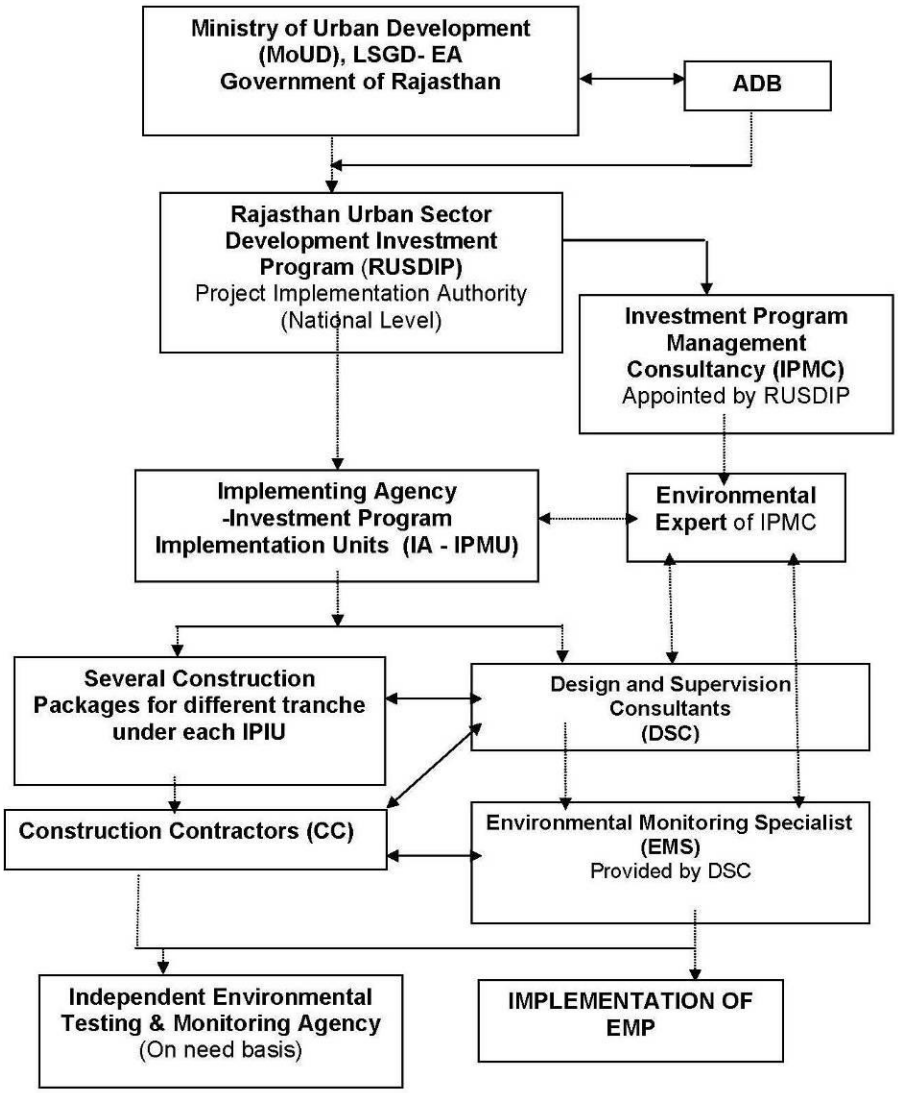
109. The main agencies involved in managing and implementing the subproject are:

(i) LSGD is responsible for management, coordination, and execution of all activities funded under the loan;
(ii) IPMU is responsible for coordinating construction of subprojects across all towns, and for ensuring consistency of approach and performance;
(iii) IPMC assists IPMU in managing the program and assures technical quality of design and construction;
(iv) DSCs design the infrastructure, manage tendering of Contractors and supervise the construction process;
(v) IPIUs appoint and manage Construction Contractors to build elements of the infrastructure in a particular town.
(vi) An inter-ministerial Empowered Committee[3] (EC) assists LSGD in providing policy guidance and coordination across all towns and subprojects.; and
(vii) City Level Committees[4] (CLCs) have also been established in each town to monitor project implementation in the town and provide recommendations to the IPIU where necessary.

110. **Figure 3** shows institutional responsibility for implementation of environmental safeguard at different level.

[3] The EC is chaired by the Minister of Urban Development and LSG, and members include Ministers, Directors and/or representatives of other relevant Government Ministries and Departments.
[4] CLCs are chaired by District Collectors, with members including officials of the ULB, local representatives of state government agencies, the IPIU, and local NGOs and CBOs.

Figure 3: Institutional Responsibility- RUSDIP



1. Responsible for carrying out mitigation measures

111. During construction stage, implementation of mitigation measures is the construction contractor's responsibility while during operation stage, BMB will be responsible for the conduct of maintenance or repair works.

112. To ensure implementation of mitigation measures during the construction period, contract clauses (**Appendix3**) for environmental provisions will be part of the civil works contracts. Contractors' conformity with contract procedures and specifications during construction will be carefully monitored by IPIU.

2. Responsible for carrying out monitoring measures

113. During construction, DSC's Environment Safeguards Officer and the designated representative of IPIU will monitor the construction contractor's environmental performance.

114. During the operation stage, monitoring will be the responsibility of BMB.

3. Responsible for reporting

115. LSGD will submit to ADB quarterly reports on implementation of the EMP and will permit ADB to field annual environmental review missions which will review in detail the environmental aspects of the Project. Any major accidents having serious environmental consequences will be reported immediately.

B. Environmental Mitigation Plan

116. **Tables 7.1 to 7.3** show the potential adverse environmental impacts, proposed mitigation measures, and responsible parties. This EMP will be included in the bid documents and will be further reviewed and updated during implementation.

Table 7.1: Anticipated Impacts and Mitigation Measures – Pre-construction Environmental Mitigation Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Environmentally-sensitive Areas	A few trees may be required to cut and vegetation (mostly shrubs and grasses) will be cleared in the sub-project area	(i) Inventory the trees to be cut; (ii) Obtain tree-cutting permit from Municipal Board/Council and/or District Collector; and (iii) Include in the bid documents provisions on replacement of 3 trees for every one tree cut during construction.	Design and Supervision Consultants (DSC) in close coordination with the Municipal Board/ Investment Program Implementation Unit (IPIU)	(i) Inventory of trees; (ii) Tree-cutting permit; (iii) Location and number of trees replaced for every one tree cut
Utilities	Telephone lines, electric poles and wires, water and sewer lines within the existing road right-of-way (ROW) will be removed.	(i) Identify and include locations and operators of these utilities in the detailed design documents to prevent unnecessary disruption of services during construction phase; and (ii) Require construction contractors to prepare a contingency plan to include actions to be done in case of unintentional interruption of services.	DSC	(i) design specification showing utility ducts if necessary; (ii) list of affected utilities and operators; (iii) bid document to include requirement for a contingency plan for service interruptions
Access Roads	Disruption to traffic flow and sensitive receptors	(i) Include entry and exit points plan drawings; and (ii) Consult affected communities prior to finalizing subproject lay-out and design.	DSC and Non-government Organization in charge of public consultation and disclosure	(i) plan drawings showing extent of widening of roads; (ii) records of future public consultations
Social and Cultural Resources	Ground disturbance can uncover and damage archaeological and historical remains	(i) Consult Archaeological Survey of India (ASI) to obtain an expert assessment of the archaeological potential of the site; (ii) Consider alternatives if the site is found to be of medium or high risk; (iii) Include state and local archaeological, cultural and historical authorities, and interest groups in consultation forums as project stakeholders so that their expertise can be made available; (iv) Develop a protocol for use by the construction contractors in conducting	IPIU and DSC	Chance Finds Protocol

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		any excavation work, to ensure that any chance finds are recognised and measures are taken to ensure they are protected and conserved. (v) While working near to schools, the advance planning should be done to avoid for noisy and dusty activities during school timings. (vi) Advance plans should be prepared so that religious and cultural sites should not be disturbed and their regular activities should not be affected due to construction works by providing approach to temples for devotees and avoid the construction works during the festival season and/or any other special occasions.		
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Disruption to traffic flow and sensitive receptors	(i) Prioritize areas within or nearest possible vacant space in the subproject sites; (ii) If it is deemed necessary to locate elsewhere, consider sites that will not promote instability and result in destruction of property, vegetation, irrigation, and drinking water supply systems; (iii) Do not consider residential areas; (iv) Take extreme care in selecting sites to avoid direct disposal to *nallah/water body* or in areas which will inconvenience the community.	IPIU and DSC to determine locations prior to award of construction contracts.	List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.
Sources of Materials	Extraction of materials can disrupt natural land contours and vegetation resulting in accelerated erosion, disturbance in natural drainage patterns, ponding and water logging, and water	(i) Prioritize sites already permitted by the Mining Department; (ii) If other sites are necessary, inform construction contractor that it is their responsibility to verify the suitability of all material sources and to obtain the approval of IPIU; and	IPIU and DSC to prepare list of approved quarry sites and sources of materials	(i) list of approved quarry sites and sources of materials; (ii) bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	pollution.	(iii) If additional quarries will be required after construction is started, inform construction contractor to obtain a written approval from IPMU.		necessary.

Table 7.2: Anticipated Impacts and Mitigation Measures – Construction Environmental Mitigation Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Sources of Materials	Extraction of rocks and material unauthorised sites may cause general scouring resulting in endangerment of bridges and continuous degradation of town regime.	(i) Use quarry sites and sources permitted by government; (ii) Verify suitability of all material sources and obtain approval of investment Program Implementation Unit (IPIU); (iii) If additional quarries will be required after construction has started, obtain written approval from PMU; and; (iv) Submit to DSC on a monthly basis documentation of sources of materials.	Construction Contractor	Construction Contractor documentation
Air Quality	Increased air pollutants (dust, particulate matters etc.) due to construction activities like excavation, stockpiling, transportation etc.	(i) Consult with IPIU/DSC on the designated areas for stockpiling of clay, soils, gravel, and other construction materials; (ii) Excavate the ground at the same time as the access roads are built so that dug material is used immediately, avoiding the need to stockpile on site; (iii) Damp down exposed soil and any stockpiled on site by spraying with water when necessary during dry weather; (iv) Use tarpaulins to cover sand and other loose material when transported by trucks; and	Construction Contractor	(i) Location of stockpiles; (ii) complaints from sensitive receptors; (iii) heavy equipment and machinery with air pollution control devices (iii) ambient air for respirable particulate matter (RPM) and suspended particulate matter (SPM); (iv) vehicular emissions such as sulphur dioxide (SO_2), nitrous oxides (NOx), carbon monoxide (CO), and hydrocarbons
	Emissions from construction	(i) Fit all heavy equipments and		

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
	vehicles, equipment, and machinery used for excavation and construction resulting to increase in concentration of vehicle-related pollutants such as carbon monoxide, sulfur oxides, particulate matter, nitrous oxides, and hydrocarbons)	machineries with air pollution control devices which are operating correctly. (ii) Take Pollution Under Control (PUC) certificate for each vehicles to ensure controlled pollution from vehicles (ii) Keep all the construction equipments and vehicles all time in good condition to reduce air pollution due to these equipments and vehicles		
Surface water quality	Mobilization of settled silt materials, run-off from stockpiled materials, and chemical contamination from fuels and lubricants during construction works can contaminate downstream surface water quality.	(i) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets; (ii) Prioritize re-use of excess soils and materials in the construction works. If soils will be disposed, consult with IPIU/DSC on designated disposal areas; (iii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies; (iv) Place storage areas for fuels and lubricants away from any drainage leading to water bodies; (v) Dispose any wastes generated by construction activities in designated sites; and (vi) Conduct surface water quality inspection according to the Environmental Management Plan (EMP).	Construction Contractor	(i) Areas for stockpiles, storage of fuels and lubricants and waste materials; (ii) number of silt traps installed along drainages leading to water bodies; (iii) records of surface water quality inspection; (iv) effectiveness of water management measures; (v) for inland water: suspended solids, oil and grease, biological oxygen demand (BOD), and coliforms.
Noise Levels	Increase in noise level due to earth-moving and excavation equipment, and the transportation of equipment, materials, and people	(i) Plan activities in consultation with IPIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance; (ii) Require horns not be used unless it is necessary to warn other road users or animals of the vehicle's approach; (iii) Minimize noise from construction	Construction Contractor	(i) Complaints from sensitive receptors; (ii) use of silencers in noise-producing equipment and sound barriers; (iii) equivalent day and night time levels

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers to minimise the sound impact to surrounding sensitive receptor; and (iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s.		
Existing Infrastructure and Facilities	Disruption of service and damage to existing infrastructure located alongside roads, in particular water supply pipes and sewer lines.	(i) Obtain from IPIU and/or DSC the list of affected utilities and operators; (ii) Prepare a contingency plan to include actions to be taken in case of unintentional interruption of services; and (iii) Develop and implement an Asbestos Cement Pipes Management Plan	Construction Contractor	(i) Existing Utilities Contingency Plan; (ii) Asbestos Cement Pipes Management Plan
Flora and Fauna	Land-clearing activities and presence of workers in the sites can damage or cause loss of existing flora	(i) Minimize removal of vegetation and disallow cutting of trees if not required for the construction activities; (ii) Where tree-removal will be required, obtain tree-cutting permit from the Municipal Council or District Collector; (iii) Earth-ball trees and transplant to IPIU-approved areas; (iv) Require to plant three native trees for every one that is removed; and (v) Prohibit employees from cutting of trees for firewood.	Construction Contractor	(i) tree-cutting permit for affected trees; (ii) number of replanted trees
Landscape and Aesthetics	solid wastes as well as excess construction materials	(i) Prepare and implement Waste Management Plan; (ii) Recover used oil and lubricants and reuse or remove from the sites; (iii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; (iv) Remove all wreckage, rubbish, or temporary structures (such as buildings,	Construction Contractor	(i) Waste Management Plan; (ii) complaints from sensitive receptors; (iii) IPIU/DSC to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		shelters, and latrines) which are no longer required; and (v) Request IPIU/DSC to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.		
Transportation – Accessibility	traffic problems and conflicts in right-of-way (ROW)	(i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites; (ii) Schedule transport and hauling activities during non-peak hours; (iii) Locate entry and exit points in areas where there is low potential for traffic congestion; (iv) Keep the site free from all unnecessary obstructions; (v) Drive vehicles in a considerate manner and speed limit; (vi) Coordinate with Municipal Traffic Office for temporary road diversions and with provision of traffic aids if transportation activities cannot be avoided during peak hours; and (vii) Notify affected sensitive receptors by prior consultations and providing sign boards informing nature and duration of construction works and contact numbers of concerns/ complaints.	Construction Contractor	(i) Traffic Management Plan; (ii) complaints from sensitive receptors; (iii) number of signages placed at subproject sites.
Socio-Economic	generation of contractual employment and increase in local revenue	(i) Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; and (ii) Procure construction materials from local market.	Construction Contractor	(i) employment records; (ii) records of sources of materials
Occupational Health and Safety	occupational hazards which can arise from working in infrastructures like roads	(i) Develop and implement site-specific Health and Safety (H&S) Plan which will include measures such as: (a) excluding	Construction Contractor	(i) site-specific Health and Safety (H & S) Plan; (ii) Equipped first-aid

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment; (c) H&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents; (ii) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site; (iii) Provide medical insurance coverage for workers; (iv) Secure all installations from unauthorized intrusion and accident risks; (v) Provide supplies of potable drinking water; (vi) Provide clean eating areas where workers are not exposed to hazardous or noxious substances; (vii) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers; (viii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted; (ix) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas; (x) Ensure moving equipment is outfitted with audible back-up alarms;		stations; (iii) Medical insurance coverage for workers; (iv) Number of accidents; (v) Supplies of potable drinking water; (vi) Clean eating areas where workers are not exposed to hazardous or noxious substances; (vii) record of H & S orientation trainings (viii) personal protective equipments; (ix) % of moving equipment outfitted with audible back-up alarms; (xi) sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal.

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		(xi) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and (xii) Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.		
Community Health and Safety.	traffic accidents and vehicle collision with pedestrians	(i) Plan routes to avoid times of peak-pedestrian activities. (ii) Liaise with IPIU/DSC in identifying high-risk areas on route cards/maps. (iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure. (iv) Provide road signs and flag persons to warn of dangerous conditions.	Construction Contractor	(i) Traffic Management Plan; (ii) complaints from sensitive receptors
Work Camps	temporary air and noise pollution from machine operation, water pollution from storage and use of fuels, oils, solvents, and lubricants	(i) Consult with IPIU/DSC before locating project offices, sheds, and construction plants; (ii) Minimize removal of vegetation and disallow cutting of trees; (iii) Provide water and sanitation facilities for employees; (iv) Prohibit employees from poaching wildlife and cutting of trees for firewood; (v) Train employees in the storage and handling of materials which can potentially cause soil contamination;	Construction Contractor	(i) complaints from sensitive receptors; (ii) water and sanitation facilities for employees; and (iii) IPIU/DSC report in writing that the camp has been vacated and restored to pre-project conditions

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		(vi) Recover used oil and lubricants and reuse or remove from the site; (vii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas; (viii) Remove all wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and (ix) Request IPIU/DSC to report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.		
Social and Cultural Resources	risk of archaeological chance finds	(i) Strictly follow the protocol for chance finds in any excavation work; (ii) Request IPIU/DSC or any authorized person with archaeological field training to observe excavation; (iii) Stop work immediately to allow further investigation if any finds are suspected; and (iv) Inform IPIU/DSC if a find is suspected, and take any action they require ensuring its removal or protection in situ. (v) Contractor in close co-ordination of IPIU should ensure that any cultural and religious places and educational facilities should not be disturbed and their routine works should be allowed to go without disturbance. (vi) While working near to schools, the school timings should be avoided for noisy and dusty activities. Likewise while working near to religious places, no disturbance should be done for the movement of devotees. Important dates	Construction Contractor	(i) records of chance finds

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
		of any special celebrations/offerings should be kept in mind and avoided for heavy works. Proper mitigation measures should be prepared for the purpose. (vi) While working near to schools, the school timings should be avoided for noisy and dusty activities. (vii) While working near to religious places, no disturbance should be done for the movement of devotees. Important dates of any special celebrations/ offerings should be kept in mind and avoided for heavy works. Proper mitigation measures should be prepared involving providing approach to temples for devotees and avoid the construction works during the festival season and/or any other special occasions		

Table 7.3: Anticipated Impacts and Mitigation Measures – Operation and Maintenance Environmental Mitigation Plan

Field	Anticipated Impact	Mitigation Measures	Responsible for Mitigation	Monitoring of Mitigation
Noise Level	noise levels tend to increase with vehicular traffic	Put signages and implement “no blowing of horns” zones where there are sensitive receptors	BMB	complaints from sensitive receptors
Accessibility	Portions of the roads may be affected during routine repairs	Coordinate with the Traffic Police Department so that warning signs and traffic diversions can be set up when necessary	BMB	complaints from sensitive receptors
Ecological Resources	ecological gain from the planting of replacement trees	Coordinate with the Municipal Council for the continuous care of the planted trees.	BMB	% survival of planted trees

C. Environmental Monitoring Program

117. **Tables 7.4 to 7.6** show the proposed environmental monitoring program for this subproject. It includes all relevant environmental parameters, description of sampling stations, frequency of monitoring, applicable standards, responsible parties, and estimated cost. Monitoring activities during the detailed engineering design stage will from part of the baseline conditions of the subproject sites and will be used as the reference for acceptance of restoration works by the construction contractors.

Table 7.4: Pre-construction Environmental Monitoring Program

Field	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
Permits – Trees and Vegetation	Proposed roads	Design and Supervision Consultants (DSC) in close coordination with the town Investment Project Implementation Unit (IPIU)	(i) Inventory of trees; (ii) Tree-cutting permit; (iii) Location and number of trees replaced for every one tree cut	checking of records	(i) Inventory of trees prepared; (ii) Tree-cutting permit obtained from Municipal Council or District Collector; (iii) Location identified and number of trees estimated	once	IPMU
Utilities	Proposed roads	DSC	(i) design specification showing utility ducts if necessary; (ii) list of affected utilities and operators; (iii) bid document to include requirement for a contingency plan for service interruptions	Physical survey, checking of records	(i) utility ducts included in the design; (ii) list of affected utilities and operators prepared; (iii) requirement for a contingency plan for service interruptions included in bid documents	once	IPMU
Access Roads	Proposed roads	DSC and Non-government Organization in charge of public consultation and disclosure	(i) plan drawings showing extent of widening of roads; (ii) records of future public consultations	checking of records	(i) plan drawings include entry and exit points; (ii) stakeholders consulted; (iii) updated IEE and EMP disclosed	once	IPMU
Social and Cultural Resources	Proposed roads	IPIU and DSC	Chance Finds Protocol	checking of records	Chance Finds Protocol provided to construction contractors prior to	once	IPMU

Field	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
					commencement of activities		
Construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	Not fixed	IPIU and DSC to determine locations prior to award of construction contracts.	List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas.	checking of records	List of selected sites for construction work camps, hot mix plants, stockpile areas, storage areas, and disposal areas provided to construction contractors prior to commencement of works.	once	IPMU
Sources of Materials	Borrow areas, quarry sites, crushers	IPIU and DSC to prepare list of approved quarry sites and sources of materials	(i) list of approved quarry sites and sources of materials; (ii) bid document to include requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	checking of records	(i) list of approved quarry sites and sources of materials provided to construction contractors (ii) bid document included requirement for verification of suitability of sources and permit for additional quarry sites if necessary.	once	IPMU
Baseline Environmental Condition – Ambient Air and noise Quality	Subproject sites	DSC	Establish baseline values of gaseous pollutants (ii) particulate matters (PM) and (iii) noise (dBA)	Air sample collection and analyses by in-house laboratory or accredited 3rd party laboratory	GOI Ambient Air and noise Quality Standards	Once prior to start of construction	IPMU
Baseline Environmental Condition - Water Quality	Subproject sites	DSC	Not applicable as there are no surface water source near the proposed project sites				

Table 7.5: Construction Environmental Monitoring Program

Mitigation Measures	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
Sources of Materials	quarries and sources of materials	Construction Contractor	Construction Contractor documentation	(i) checking of records; (ii) visual inspection of sites	(i) sites are permitted; (ii) report submitted by construction contractor monthly (until such time there is excavation work)	Monthly submission for construction contractor as needed for DSC	DSC
Air Quality	construction sites and areas designated for stockpiling of materials	Construction Contractor	(i) Location of stockpiles; (ii) complaints from sensitive receptors; (iii) heavy equipment and machinery with air pollution control devices (iii) ambient air for gaseous pollutants and particulate matter (PM); (iv) vehicular emissions such as sulphur dioxide (SO_2), nitrous oxides (NOx), carbon monoxide (CO), and hydrocarbons (HC)	(i) checking of records; (ii) visual inspection of sites	(i) stockpiles on designated areas only; (ii) complaints from sensitive receptors satisfactorily addressed; (iii) air pollution control devices working properly; (iv) GOI Ambient Quality Standards for ambient air quality; (iv) GOI Vehicular Emission Standards for SO_2, NOx, CO and HC.	monthly for checking records	DSC
Water Quality	(i) construction sites; (ii) areas for stockpiles, storage of fuels and lubricants and waste	Construction Contractor	(i) Areas for stockpiles, storage of fuels and lubricants and waste materials; (ii) number of silt traps installed along drainages leading to water bodies; (iii) records of surface water quality	visual inspection	(i) designated areas only; (ii) silt traps installed and functioning; (iii) no noticeable increase in suspended solids and silt from	monthly	DSC

Mitigation Measures	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
	materials;		inspection; (iv) effectiveness of water management measures;		construction activities		
Noise Levels	(i) construction sites; (ii) areas for stockpiles, storage of fuels and lubricants and waste materials; (iii) work camps	Construction Contractor	(i) Complaints from sensitive receptors; (ii) use of silencers in noise-producing equipment and sound barriers; (iii) equivalent day and night time levels of noise (dBA)	(i) checking of records; (ii) visual inspection	(i) complaints from sensitive receptors satisfactorily addressed; and (ii) silencers in noise-producing equipment functioning as design; and (iii) sound barriers installed where necessary	Monthly	DSC
Existing Infrastructure and Facilities	(i) construction sites; (ii) alignment of affected utilities	Construction Contractor	(i) Existing Utilities Contingency Plan; (ii) Asbestos Cement Pipes Management Plan	(i) checking of records; (ii) visual inspection	implementation according to Utilities Contingency Plan and Asbestos Cement Plan	as needed	DSC
Flora and Fauna	(i) construction sites; (ii) location where replacement trees will be planted	Construction Contractor	(i) tree-cutting permit for affected trees; (ii) number of replanted trees	(i) checking of records; (ii) visual inspection	number of trees cut, replanted and location according to the tree-cutting permit	as needed	DSC
Landscape and Aesthetics	(i) construction sites; (ii) areas for stockpiles, storage of	Construction Contractor	(i) Waste Management Plan; (ii) complaints from sensitive receptors; (iii) IPIU/DSC to report in writing that the	(i) checking of records; (ii) visual inspection	(i) no accumulation of solid wastes on-site; (ii) implementation of Waste Management Plan;	Monthly	DSC

Mitigation Measures	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
	fuels and lubricants and waste materials; (iii) work camps		necessary environmental restoration work has been adequately performed before acceptance of work.		(iii) complaints from sensitive receptors satisfactorily addressed.		
Transportation – Accessibility	(i) construction sites; (ii) traffic routes	Construction Contractor	(i) Traffic Management Plan; (ii) complaints from sensitive receptors; (iii) number of signages placed at subproject sites.	visual inspection	(i) implementation of Traffic Management Plan; (ii) complaints from sensitive receptors satisfactorily addressed; (iii) signages visible and located in designated areas	Monthly	DSC
Socio-Economic	construction sites	Construction Contractor	(i) employment records; (ii) records of sources of materials	checking of records	number of employees from town equal or greater than 50% of total workforce	Quarterly	DSC
Occupational Health and Safety	construction sites	Construction Contractor	(i) site-specific Health and Safety (H&S) Plan; (ii) Equipped first-aid stations; (iii) Medical insurance coverage for workers; (iv) Number of accidents; (v) Supplies of potable drinking water; (vi) Clean eating areas where workers are not exposed to hazardous or noxious substances; (vii) record of H & S orientation trainings	(i) checking of records; (ii) visual inspection	(i) implementation of H&S plan; (ii) number of work-related accidents; (iii) % usage of personal protective equipment; (iv) number of first-aid stations, frequency of potable water delivery, provision of clean eating area, and number of sign boards are according to	Quarterly	DSC

Mitigation Measures	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
			(viii) personal protective equipments; (ix) % of moving equipment outfitted with audible back-up alarms; (xi) sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal.		approved plan; (v) % of moving equipment outfitted with audible back-up alarms		
Community Health and Safety.	construction sites	Construction Contractor	(i) Traffic Management Plan; (ii) complaints from sensitive receptors	visual inspection	(i) implementation of Traffic Management Plan; (ii) complaints from sensitive receptors satisfactorily addressed	Quarterly	DSC
Work Camps	work camps	Construction Contractor	(i) complaints from sensitive receptors; (ii) water and sanitation facilities for employees; and (iii) IPIU/DSC report in writing that the camp has been vacated and restored to pre-project conditions	visual inspection	(i) designated areas only; (ii) complaints from sensitive receptors satisfactorily addressed	Quarterly	DSC
Social and Cultural Resources	construction sites	Construction Contractor	records of chance finds	checking of records	Implementation of Chance Finds Protocol	as needed	DSC

Table 7.6: Operation and Maintenance Environmental Monitoring Program

Mitigation Measures	Location	Responsible for Mitigation	Monitoring of Mitigation	Method of Monitoring	Indicators/ Standards	Frequency	Responsible for Monitoring
Noise Levels	subproject sites	Baran Municipal Board (BMB)	complaints from sensitive receptors	checking of records	complaints from sensitive receptors satisfactorily addressed	as needed	BMB
Accessibility	subproject sites	BMB	complaints from sensitive receptors	checking of records	complaints from sensitive receptors satisfactorily addressed	as needed	BMB
Ecological Resources	subproject sites	BMB	% survival of planted trees	checking of records	at least 80% survival rate	quarterly	BMB

D. Environmental Management Plan Costs

118. Most of the mitigation measures require the Construction Contractors to adopt good site practice, which should be part of their normal procedures already, so there are unlikely to be major costs associated with compliance. Regardless of this, any costs of mitigation by the construction contractors or DSC are included in the budgets for the civil works and do not need to be estimated separately here. Mitigation that is the responsibility of LSGD will be provided as part of their management of the project, so this also does not need to be duplicated here.

119. The remaining actions in the EMP are the various environmental monitoring activities to be conducted by the Environmental Monitoring Specialist. These have not been budgeted elsewhere, and their costs are shown in Table 7.7. The figures show that the total cost of environmental management and monitoring for the subproject as a whole (covering design, 1 year of construction and the first five years of operation) is INR0.72 million.

Table 7.7: Environmental management and monitoring costs (INR

Item	Quantity	Unit Cost	Total Cost	Sub-total	Source of Funds
1. Implementation of EMP (2 years)					
Environmental Monitoring Specialist of DSC	1 x 3 month	140,000[5]	420,000		DSC
Survey and monitoring expenses - air and noise quality	Lump Sum	100,000	100,000	520,000	Contractor
2. Improvement of aesthetics- along the roads including plantation	Lump Sum	200,000	200,000	200,000	Contractor
TOTAL				720,000	

(Air Quality- Once in a week for 2 weeks 2 locations , semi-annually for the parameters like PM_{10}, $PM_{2.5}$, SO_2 ,NOx, CO; Noise level- Once (6 times in a day in 6 working hours for 2 days at 2 locations, measurement semi-annually)

[5] Unit costs of domestic consultants include fee, travel, accommodation and subsistence

IX. FINDINGS AND RECOMMENDATIONS

120. The process described in this document has assessed the environmental impacts of all elements of the infrastructure proposed under the Baran Roads improvement Subproject. Potential negative impacts were identified in relation to construction and operation of the improved infrastructure, but no impacts were identified as being due to either the subproject design or location. Mitigation measures have been developed to reduce all negative impacts to acceptable levels. These were discussed with specialists responsible for the engineering aspects, and as a result some measures have already been included in the outline designs for the infrastructure. This means that the number of impacts and their significance has already been reduced by amending the design.

121. Regardless of these and various other actions taken during the IEE process and in developing the project, there will still be impacts on the environment when the infrastructure is built and when it is operating. This is mainly because of the invasive nature of excavation work; some parts of which are within densely populated area of the town. Because of these factors the most significant impacts are on the physical environment, the human environment, and the cultural heritage.

122. During the construction phase, impacts mainly arise from the need to dispose of large quantities of waste soil produced by excavation at the road site. These are common impacts of construction in and around urban areas, and there are well developed methods for their mitigation.

123. One field in which impacts are much less important is archaeology, nevertheless a series of specific measures have been developed to avoid damaging important remains.

124. Special measures were also developed to protect workers and the public from exposure to carcinogenic asbestos fibres in the event that Asbestos Cement pipes used in the existing water supply system are encountered accidentally during excavation work.

125. There were limited opportunities to provide environmental enhancements, but certain measures were included. For example it is proposed that the project will employ in the workforce people who live in the vicinity of construction sites to provide them with a short-term economic gain; and plant trees around completed parts of the roads once it is operating, to improve the appearance and provide a small ecological gain.

126. Once the system is operating, it will be important that Baran Municipal Board maintains the subproject roads as a whole in proper operating order, because the town environment will deteriorate rapidly due to damaged roads if the system begins to fail. The project will provide capacity building, public education and financial support to ensure continuation of the operating system.

127. The main impacts of the operating waste management system will be beneficial as the general environment of the town will improve considerably as there will be less traffic congestion due to wider and smoother roads. Some people will also gain socio-economically from being employed in companies engaged to operate the system, or in the expanded Municipality manpower.

128. Mitigation will be assured by a program of environmental monitoring conducted during construction and operation to ensure that all measures are implemented, and to determine

whether the environment is protected as intended. This will include observations on- and off-site, document checks, and interviews with workers and beneficiaries, and any requirements for remedial action will be reported to the IPMU. There will also be a longer-term survey to monitor the expected improvements in the town environment from the Roads improvement.

129. Finally, stakeholders were involved in developing the IEE through face-to-face discussions on site and a large public meeting held in the town, after which views expressed were incorporated into the IEE and the planning and development of the project. The IEE will be made available at public locations in the town and will be disclosed to a wider audience via the ADB website. The consultation process will be continued and expanded during project implementation, when a nationally-recognised NGO will be appointed to handle this key element to ensure that stakeholders are fully engaged in the project and have the opportunity to participate in its development and implementation.

X. CONCLUSIONS

130. The environmental impacts of the proposed improvements in Roads infrastructure in Baran town have been assessed by the Initial Environmental Examination reported in this document, conducted according to ADB guidelines. The overall conclusion is that providing the mitigation, compensation and enhancement measures are implemented in full, there should be no significant negative environmental impacts as a result of location, design, construction or operation of the subproject. There should in fact be some small benefits from recommended mitigation and enhancement measures, and major improvements in the town environment once the scheme is in operation.

131. Location of subproject sites are existing 5 city roads in the town and at government land only therefore no requirement of private land acquisition . Therefore no additional impact is expected.

132. There are no uncertainties in the analysis, and no additional work is required to comply with ADB procedure.

Appendix 1

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 the 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: India/Rajasthan Urban Sector Development Investment Programme (Tranche-

Sector Division: Widening and strengthening of roads

Screening Questions	Yes	No	Remarks
A. PROJECT SITING **IS THE PROJECT AREA ADJACENT TO OR WITHIN ANY OF THE FOLLOWING ENVIRONMENTALLY SENSITIVE AREAS?**		√	There are no any environmentally sensitive areas
▪ **CULTURAL HERITAGE SITE**		√	There are no any cultural heritage sites near proposed roads
▪ **PROTECTED AREA**		√	There are no any protected areas near proposed roads
▪ **WETLAND**		√	No
▪ **MANGROVE**		√	No
▪ **ESTUARINE**		√	No
▪ **BUFFER ZONE OF PROTECTED AREA**		√	No
▪ **SPECIAL AREA FOR PROTECTING BIODIVERSITY**		√	No
B. POTENTIAL ENVIRONMENTAL IMPACTS **WILL THE PROJECT CAUSE…**			
▪ encroachment on historical/cultural areas; disfiguration of landscape by road embankments, cuts, fills, and quarries?		√	No such areas near the proposed roads, no need for land acquisition only existing ROW shall be used for widening

Screening Questions	Yes	No	Remarks
▪ encroachment on precious ecology (e.g. sensitive or protected areas)?		√	There is no encroachment on precious ecology in this area.
▪ alteration of surface water hydrology of waterways crossed by roads, resulting in increased sediment in streams affected by increased soil erosion at construction site?		√	There is no surface water resources exist in the vicinity of the project area.
▪ deterioration of surface water quality due to silt runoff and sanitary wastes from worker-based camps and chemicals used in construction?		√	There is no surface water resources exist in this area.
▪ increased local air pollution due to rock crushing, cutting and filling works, and chemicals from asphalt processing?		√	Rock crushing, cutting and filling is not required in this project, all the construction materials shall be procured from approved quarry sites
▪ risks and vulnerabilities related to occupational health and safety due to physical, chemical, biological, and radiological hazards during project construction and operation during project construction and operation?			No such impact is anticipated
▪ noise and vibration due to blasting and other civil works?		√	No blasting work will be involved in the project.
▪ dislocation or involuntary resettlement of people?	√		Some temporary shops may be affected and shall be addressed in SRP
▪ dislocation and compulsory resettlement of people living in right-of-way?	√		Some market place and residential area fall on the stretches of the road, some structures and temporary shops may be affected for which mitigation measures shall be addressed in SRP.
▪ disproportionate impacts on the poor, women and children, Indigenous Peoples or other vulnerable groups?		√	No such impact is anticipated
▪ other social concerns relating to inconveniences in living conditions in the project areas that may trigger cases of upper respiratory problems and stress?	√		Generated dust may cause some short term impact, for which mitigation measures will be applied
▪ hazardous driving conditions where construction interferes with pre-existing roads?	√		During construction road closure/diversion will be required which may cause hazardous driving conditions where construction interferes with pre-existing roads. Contractor will provide alternate road during construction phase and will maintain traffic management to avoid any hazardous driving condition.
▪ poor sanitation and solid waste disposal in construction camps and work sites, and possible	√		Problem of sanitation and solid waste management may come

Screening Questions	Yes	No	Remarks
transmission of communicable diseases (such as STI's and HIV/AIDS) from workers to local populations?			during construction works. Contractor will have to provide all necessary facilities in workers camp to avoid any sanitation and solid waste disposal problem.
▪ creation of temporary breeding habitats for diseases such as those transmitted by mosquitoes and rodents?		√	There is no water logging condition
▪ accident risks associated with increased vehicular traffic, leading to accidental spills of toxic materials?	√		Pre-existing traffic may result accidents due to construction vehicle therefore proper management plan to be followed
▪ increased noise and air pollution resulting from traffic volume?	√		Pre-existing traffic and future construction activities may increase noise and air pollution.
▪ increased risk of water pollution from oil, grease and fuel spills, and other materials from vehicles using the road?		√	There is no surface water resource in this area.
▪ social conflicts if workers from other regions or countries are hired?		√	Local labour will be employed
▪ large population influx during project construction and operation that causes increased burden on social infrastructure and services (such as water supply and sanitation systems)?		√	No
▪ 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?		√	No
▪ community safety risks due to both accidental and natural causes, especially where the structural elements or components of the project 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.		√	No

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 temperature, precipitation, or extreme events patterns over the Project lifespan affect technical or financial sustainability (eg., increased erosion or landslides could increase maintenance costs, permafrost melting or increased soil moisture content could affect sub0-grade).		√	
▪ Are there any demographic or socio-economic aspects of the Project area that are already vulnerable (eg., 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., by encouraging settlement in areas that will be more affected by floods in the future, or encouraging settlement in earthquake zones)?		√	

Note: Hazards are potentially damaging physical events.

Appendix 2

PUBLIC CONSULTATION- ENVIRONMENT

Baran: Roads Improvement sub project

Issues discussed

- Awareness and extent of the project and development components
- Benefits of Project for the economic and social Upliftment of Community
- Labour availability in the Project area or requirement of outside labour involvement
- Local disturbances due to Project Construction Work
- Necessity of tree felling etc. at project sites
- Water logging and drainage problem if any
- Drinking water problem
- Forest and sensitive area nearby the project site
- Movement of wild animal if any

CONSULTATION 1

1. **Date and time of Consultation: 24.06.2013, 10.30 am**

2. **Location: Charmurti Chowraha to Pratap Chouraha road stretch**

Table: Issues of the Public Consultation- Design phase

Sr. No.	Key Issues/Demands	Perception of community	Action to be taken
1	Awareness of the project – including coverage area	People are not aware of the project and coverage area	In planning phase consultations with persons of the project road should be done and before start of the project caution boards indicating the nature or work to be displayed
2	In what way they may associate with the project	They will be benefitted by overcoming the problem of water logging during rainy season and getting good quality road	Problem of water logging on this road should be taken in consideration during planning
3	Presence of any forest, wild life or any sensitive / unique environmental components nearby the project area	No such issue	
4	Presence of historical/ cultural/ religious sites nearby	No any historical site is there near the road but some schools and Government officer are there	Peak traffic hours should be kept in mind considering the schools and offices on the road
5	Un favorable climatic condition	Very hot during summer (upto 48 degree celcius) and very cold during winter	
6	Occurrence of flood	No flood reported in the area but water logging occurs during heavy rain	Water logging should be kept in mind during planning phase
7	Drainage and sewerage problem facing	Satisfactory drainage system exist, but water logging occurs during heavy	

Sr. No.	Key Issues/Demands	Perception of community	Action to be taken
		rains, no existence of sewer line	
8	Present drinking water problem – quantity and quality	No any	
9	Present solid waste collection and disposal problem	Satisfactory, SW is dumped by public at roadside and open areas, municipal body collects SW from the points	
10	Availability of labour during construction time	Yes, labors are easily available from nearby villages on daily basis	Employ at least 50% of unskilled labours from nearby places
11	Access road to project site	Yes	
12	Perception of villagers on tree felling and afforestation	No tree cutting is expected in this stretch of road	
13	Dust and noise pollution and disturbances during construction work	These may affect people up to some extent	Proper mitigation measures to be taken
14	Setting up worker camp site within the village/ project locality	Project road passing through market place and residential area so worker camp can't be set up at this road	Worker camp should be away from residential area
15	Safety of residents during construction phase and plying of vehicle for construction activities	Yes during construction phase road traffic and safety of road users may be affected	Plan should be made to maintain the safety of people and safe traffic flow
16	Requirement of enhancement of other facilities	People want public urinal and proper drainage at this road	Public urinal should be provided at some places and proper drainage for rain water should be provided

NAME AND POSITION OF PERSONS CONSULTED

- Shailendra Chourasia, shop keeper, Girau sweets Charmurti Chouraha
- Mohd. Kayyum Khan, local resident
- Ramesh Suman, Shopkeeper, (Tea-Pan shop)
- Surendra Singh, Tushar Photostate
- Pramod Nainwa, MMB Sweet, Pratap Chowk
- Sham Gautam, local resident near Pratap Chowk
- Satyanarayan Chourasia, owner Gyarsilal & Sons

Summary of outcome:

People want the proposed strengthening works on this road. They want proper drainage system as water logging problem prevails during heavy rains. The temporary shopkeepers are ready to shift their shops/business to nearby place during construction phase. This is busy road so they want to finish the work quickly.

CONSULTATION 2

1. Date and time of Consultation: 24.06.2013, 11.30 a.m.

2. **Location: NH-76 to Lanka colony road stretch at various places**

Table: Issues of the Public Consultation- Design phase

Sr. No.	Key Issues/Demands	Perception of community	Action to be taken
1	Awareness of the project – including coverage area	People are not aware of the project and coverage area	In planning phase consultations with persons of the project road should be done and before start of the project caution boards indicating the nature or work to be displayed
2	In what way they may associate with the project	They will be benefitted by overcoming the problem of water logging during rainy season and getting good quality road	Problem of water logging on this road should be taken in consideration during planning
3	Presence of any forest, wild life or any sensitive / unique environmental components nearby the project area	No such issue	
4	Presence of historical/ cultural/ religious sites nearby	No any historical site is there near the road but some schools and religious places are there near to the proposed road	Peak traffic hours should be kept in mind considering the schools on the road
5	Un favorable climatic condition	Very hot during summer (upto 48 degree celcius) and very cold during winter	
6	Occurrence of flood	No flood reported in the area but water logging occurs during heavy rain and nallah becomes overflowed	Water logging should be kept in mind during planning phase
7	Drainage and sewerage problem facing	Satisfactory drainage system exist, but water logging occurs during heavy rains, no existence of sewer line	
8	Present drinking water problem – quantity and quality	No any	
9	Present solid waste collection and disposal problem	Satisfactory, SW is dumped by public at roadside and open areas, municipal body collects SW from the points	
10	Availability of labour during construction time	Yes, labors are easily available from nearby villages on daily basis	Employ at least 50% of unskilled labours from nearby places
11	Access road to project site	Yes	
12	Perception of villagers on tree felling and afforestation	No tree cutting is expected in this stretch of road	
13	Dust and noise pollution and disturbances during construction work	These may affect people up to some extent	Proper mitigation measures to be taken
14	Setting up worker camp site within the village/ project locality	Project road passing through residential area so worker camp can't be set up at this road but on the end	Worker camp should be away from residential area

Sr. No.	Key Issues/Demands	Perception of community	Action to be taken
		of the road there is some vacant land where workers camp can be set up	
15	Safety of residents during construction phase and plying of vehicle for construction activities	Yes during construction phase road traffic and safety of road users may be affected	Plan should be made to maintain the safety of people and safe traffic flow
16	Requirement of enhancement of other facilities	People want widening of pulia (culvert) on nallah and proper drainage at this road	Widening of pulia (culvert) on nallah should be done and proper drainage for rain water should be provided

NAME AND POSITION OF PERSONS CONSULTED

- Inder, Local resident
- Ram Chandra, Local Resident
- Remesh Rathod, Local resident
- Lekhraj, Shop keeper (movable thela of Poha-kachauri) near NH
- Chitar Lal, owner Chitar Lal Engineering (motor repairing shop)
- Om Nagar, owner Nagar Spare Parts
- Devaki Nandan, Milk dairy
- Govind Kohli, Sheela, local residents

Summary of outcome:

People are in favour of widening and strengthening of road because they suffer from existing road as it is narrow at some place and damaged at almost full length. People want to increase the width of culvert on nallah as it is very narrow and having no side wall. Shopkeepers are ready to bear the disturbance caused during construction works.

CONSULTATION 3

1. **Date and time of Consultation: 24.06.2013, 12.30 p.m.**

2. **Location- Babji Nagar (Near Devine Public School) to NH-27 road at various places**

Table: Issues of the Public Consultation- Design phase

Sr. No.	Key Issues/Demands	Perception of community	Action to be taken
1	Awareness of the project – including coverage area	People are not aware of the project and coverage area	In planning phase consultations with persons of the project road should be done and before start of the project caution boards indicating the nature or work to be displayed
2	In what way they may associate with the project	They will be benefitted by proposed widening and strengthening by getting good quality road	
3	Presence of any forest, wild life or any sensitive / unique environmental components nearby the project area	No such issue	
4	Presence of historical/ cultural/ religious sites nearby	No any historical site is there near the road but one school and religious place (Jind Baba Prachin Kalyana Bai ki baori) are there near to the proposed road	Peak traffic hours should be kept in mind considering the school timings situated on the road
5	Un favorable climatic condition	Very hot during summer (upto 48 degree celcius) and very cold during winter	
6	Occurrence of flood	No flood reported in the area	
7	Drainage and sewerage problem facing	There is no drainage and sewerage system along this road but two cross over nallah exist on this road	
8	Present drinking water problem – quantity and quality	No any	
9	Present solid waste collection and disposal problem	Solid waste collection and disposal system is not running at this road	
10	Availability of labour during construction time	Yes, labors are easily available from nearby villages on daily basis	Employ at least 50% of unskilled labours from nearby places
11	Access road to project site	Yes	
12	Perception of villagers on tree felling and afforestation	No tree cutting is expected in this stretch of road	
13	Dust and noise pollution and disturbances during construction work	These may affect people up to some extent	Proper mitigation measures to be taken
14	Setting up worker camp site within the village/ project locality	There are private agricultural fields on both sides of road, where workers camp can be set up with prior consent of the property owner	Worker camp should be away from residential area and with prior consent from the property

Sr. No.	Key Issues/Demands	Perception of community	Action to be taken
			owner
15	Safety of residents during construction phase and plying of vehicle for construction activities	Yes during construction phase road traffic and safety of road users may be affected	Plan should be made to maintain the safety of people and safe traffic flow
16	Requirement of enhancement of other facilities	No any	

NAME AND POSITION OF PERSONS CONSULTED

- Dharmendra Sharma, office manager, Devine Public School, Babji Nagar
- Mahesh Kumar, Care taker, Jind Baba Prachin Kalyanabai Ki Baori
- Satish kumar- road user (auto driver)
- Shailesh- local resident

Summary of outcome:
People are in favour of widening and strengthening of road because they suffer from existing road as it is narrow at some places. School Manager wants that during peak hours (at the time of opening and closing of school) the works should be avoided and care to be taken to prevent any accident of the students.

CONSULTATION 4

3. **Date and time of Consultation: 24.06.2013, 1.30 p.m.**

4. **Location- Sahkar Bhavan (civil Lines) to NH-27 road at various places**

Table: Issues of the Public Consultation- Design phase

Sr. No.	Key Issues/Demands	Perception of community	Action to be taken
1	Awareness of the project – including coverage area	People are not aware of the project and coverage area	In planning phase consultations with persons of the project road should be done and before start of the project caution boards indicating the nature or work to be displayed
2	In what way they may associate with the project	They will be benefitted by proposed widening and strengthening by getting good quality road	
3	Presence of any forest, wild life or any sensitive / unique environmental components nearby the project area	No such issue	
4	Presence of historical/ cultural/ religious sites nearby	No any historical, cultural or religious site is there near the road	
5	Un favorable climatic condition	Very hot during summer (upto 48 degree celcius) and very cold during	

Sr. No.	Key Issues/Demands	Perception of community	Action to be taken
		winter	
6	Occurrence of flood	No flood reported in the area	
7	Drainage and sewerage problem facing	There is no drainage and sewerage system along this road	
8	Present drinking water problem – quantity and quality	No any	
9	Present solid waste collection and disposal problem	Solid waste collection and disposal system is not running at this road	
10	Availability of labour during construction time	Yes, labors are easily available from nearby villages on daily basis	Employ at least 50% of unskilled labours from nearby places
11	Access road to project site	Yes	
12	Perception of villagers on tree felling and afforestation	No tree cutting is expected in this stretch of road	If tree cutting is required, compensatory plantation should be done
13	Dust and noise pollution and disturbances during construction work	These may affect people up to some extent	Proper mitigation measures to be taken
14	Setting up worker camp site within the village/ project locality	There are private agricultural fields on both sides of road, where workers camp can be set up with prior consent of the property owner	Worker camp should be away from residential area and with prior consent from the property owner
15	Safety of residents during construction phase and plying of vehicle for construction activities	Yes during construction phase road traffic and safety of road users may be affected	Plan should be made to maintain the safety of people and safe traffic flow
16	Requirement of enhancement of other facilities	No any	

NAME AND POSITION OF PERSONS CONSULTED

- Pappu Yogi, Tea shopkeeper near Sahkar Bhavan
- Pradeep Soni, Tea chopkeeper near Sahkar Bhavan
- Bhagwat Prasad, Road user

Summary of outcome:

People are in favour of widening and strengthening of road because they suffer from existing road as it is narrow at some places.

CONSULTATION 5

5. **Date and time of Consultation: 23.08.2013, 3.30 p.m.**

6. **Location- ROB to Char Murti Chouraha at various places**

Table: Issues of the Public Consultation- Design phase

Sr. No.	Key Issues/Demands	Perception of community	Action to be taken
1	Awareness of the project – including coverage area	People are not aware of the project and coverage area	In planning phase consultations with persons of the project road should be done and before start of the project caution boards indicating the nature or work to be displayed
2	In what way they may associate with the project	They will be benefitted by proposed widening and strengthening by getting good quality road, some people want to work in the project during execution	
3	Presence of any forest, wild life or any sensitive / unique environmental components nearby the project area	No such issue	
4	Presence of historical/ cultural/ religious sites nearby	No any historical, cultural or religious site is there near the road	
5	Un favorable climatic condition	Very hot during summer (upto 48 degree celcius) and very cold during winter	
6	Occurrence of flood	No flood reported in the area	
7	Drainage and sewerage problem facing	There is no drainage problem along this road, drainage is provided on both sides, no sewerage system prevails in Baran town	
8	Present drinking water problem – quantity and quality	No any	
9	Present solid waste collection and disposal problem	Solid waste collection and disposal system is running at this road	
10	Availability of labour during construction time	Yes, labors are easily available from nearby villages on daily basis	Employ at least 50% of unskilled labours from nearby places
11	Access road to project site	Yes, existing road	
12	Perception of villagers on tree felling and afforestation	No tree cutting is expected in this stretch of road	If tree cutting is required, compensatory plantation should be done
13	Dust and noise pollution and disturbances during construction work	These may affect people up to some extent	Proper mitigation measures to be taken
14	Setting up worker camp site within the village/ project locality	This is busy city road and market place, therefore no worker camp can be set up near this road	Worker camp should be away from residential area and with prior consent from the property

Sr. No.	Key Issues/Demands	Perception of community	Action to be taken
			owner
15	Safety of residents during construction phase and plying of vehicle for construction activities	Yes during construction phase road traffic and safety of road users may be affected	Plan should be made to maintain the safety of people and safe traffic flow
16	Requirement of enhancement of other facilities	No any	

NAME AND POSITION OF PERSONS CONSULTED

- Prahlad Nagar, Tea shopkeeper near proposed road
- Sitaram Prajapati, Auto repairing shop
- Sabir Hussain, Auto repairing shop
- Jalil Ahemed S/O Abdul Gafur, Tyre repairing shop
- Rinku, Sabir Khan, auto repairing shop (4wheeler)

Summary of outcome:

People are in favour of widening and strengthening of road because they suffer from existing road as it is a busy road, single without divider and damaged at several places.

Appendix 3

Recommended Contract Clauses

A. Sources of Materials

(i) Use quarry sites and sources permitted by government;
(ii) Verify suitability of all material sources and obtain approval of Investment Program Implementation Unit (IPIU);
(iii) If additional quarries will be required after construction has started, obtain written approval from PMU; and;
(iv) Submit to DSC on a monthly basis documentation of sources of materials.

B. Air Quality

(i) Consult with IPIU/DSC on the designated areas for stockpiling of clay, soils, gravel, and other construction materials;
(iii) Damp down exposed soil and any stockpiled on site by spraying with water when necessary during dry weather;
(iv) Use tarpaulins to cover sand and other loose material when transported by trucks; and
(v) Fit all heavy equipment and machinery with air pollution control devices which are operating correctly.

C. Surface Water Quality

(i) Avoid stockpiling of earth fill especially during the monsoon season unless covered by tarpaulins or plastic sheets;
(ii) Prioritize re-use of excess spoils and materials in the construction works. If spoils will be disposed, consult with IPIU/DSC on designated disposal areas;
(iii) Install temporary silt traps or sedimentation basins along the drainage leading to the water bodies;
(iv) Place storage areas for fuels and lubricants away from any drainage leading to water bodies;
(v) Dispose any wastes generated by construction activities in designated sites; and
(vi) Conduct surface quality inspection according to the Environmental Management Plan (EMP).

D. Noise Levels

(i) Plan activities in consultation with IPIU/DSC so that activities with the greatest potential to generate noise are conducted during periods of the day which will result in least disturbance;
(ii) Require horns not be used unless it is necessary to warn other road users or animals of the vehicle's approach;
(iii) Minimize noise from construction equipment by using vehicle silencers, fitting jackhammers with noise-reducing mufflers, and portable street barriers the sound impact to surrounding sensitive receptor; and
(iv) Maintain maximum sound levels not exceeding 80 decibels (dbA) when measured at a distance of 10 m or more from the vehicle/s.

E. Existing Infrastructure and Facilities

(i) Obtain from IPIU and/or DSC the list of affected utilities and operators;
(ii) Prepare a contingency plan to include actions to be done in case of unintentional interruption of services; and
(iii) Develop and implement an Asbestos Cement Pipes Management Plan

F. Accessibility

(i) Plan transportation routes so that heavy vehicles do not use narrow local roads, except in the immediate vicinity of delivery sites;
(ii) Schedule transport and hauling activities during non-peak hours;
(iii) Locate entry and exit points in areas where there is low potential for traffic congestion;
(iv) Keep the site free from all unnecessary obstructions;
(v) Drive vehicles in a considerate manner;

(vi) Coordinate with Baran Traffic Office for temporary road diversions and for provision of traffic aids if transportation activities cannot be avoided during peak hours; and
(vii) Notify affected sensitive receptors by providing sign boards informing nature and duration of construction works and contact numbers for concerns/complaints.

G. Landscape and Aesthetics

(i) Prepare and implement Waste Management Plan;
(ii) Recover used oil and lubricants and reuse or remove from the sites; (iii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
(iv) Remove all wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and
(v) Request IPIU/DSC to report in writing that the necessary environmental restoration work has been adequately performed before acceptance of work.

H. Socio-Economic – Income

(i) Leave spaces for access between mounds of soil/construction materials for easy public movement;
(ii) Provide walkways and metal sheets where required to maintain access across trenches for people and vehicles;
(iii) Increase workforce in front of critical areas such as institutions, place of worship, business establishment, hospitals, and schools;
(iv) Consult businesses and institutions regarding operating hours and factoring this in work schedules; and
(v) Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints.

I. Socio-Economic – Employment

(i) Employ at least 50% of the labour force, or to the maximum extent, local persons within the 2-km immediate area if manpower is available; and
(ii) Procure construction materials from local market to enhance local income

J. Occupational Health and Safety

(i) Develop and implement site-specific Health and Safety (H&S) Plan which will include measures such as: (a) excluding public from the site; (b) ensuring all workers are provided with and use Personal Protective Equipment; (c) H&S Training for all site personnel; (d) documented procedures to be followed for all site activities; and (e) documentation of work-related accidents;
(ii) Ensure that qualified first-aid can be provided at all times. Equipped first-aid stations shall be easily accessible throughout the site;
(iii) Provide medical insurance coverage for workers;
(iv) Secure all installations from unauthorized intrusion and accident risks;
(v) Provide supplies of potable drinking water;
(vi) Provide clean eating areas where workers are not exposed to hazardous or noxious substances;
(vii) Provide H&S orientation training to all new workers to ensure that they are apprised of the basic site rules of work at the site, personal protective protection, and preventing injuring to fellow workers;
(viii) Provide visitor orientation if visitors to the site can gain access to areas where hazardous conditions or substances may be present. Ensure also that visitor/s do not enter hazard areas unescorted;
(ix) Ensure the visibility of workers through their use of high visibility vests when working in or walking through heavy equipment operating areas;
(x) Ensure moving equipment is outfitted with audible back-up alarms;
(xi) Mark and provide sign boards for hazardous areas such as energized electrical devices and lines, service rooms housing high voltage equipment, and areas for storage and disposal. Signage shall be

in accordance with international standards and be well known to, and easily understood by workers, visitors, and the general public as appropriate; and
(xii) Disallow worker exposure to noise level greater than 85 dBA for a duration of more than 8 hours per day without hearing protection. The use of hearing protection shall be enforced actively.

K. Asbestos Cement Pipes

(i) Train all personnel (including manual labourers) to enable them to understand the dangers of AC pipes and to be able to recognise them in situ;
(ii) Report to management immediately if AC pipes are encountered;
(iii) Develop and apply AC Management Plan.

J. Community Health and Safety.

(i) Plan routes to avoid times of peak-pedestrian activities.
(ii) Liaise with IPIU/DSC in identifying high-risk areas on route cards/maps.
(iii) Maintain regularly the vehicles and use of manufacturer-approved parts to minimize potentially serious accidents caused by equipment malfunction or premature failure.
(iv) Provide road signs and flag persons to warn of dangerous conditions.

L. Work Camps

(i) Consult with IPIU/DSC before locating project offices, sheds, and construction plants;
(ii) Minimize removal of vegetation and disallow cutting of trees;
(iii) Provide water and sanitation facilities for employees;
(iv) Prohibit employees from poaching wildlife and cutting of trees for firewood;
(v) Train employees in the storage and handling of materials which can potentially cause soil contamination;
(vi) Recover used oil and lubricants and reuse or remove from the site;
(vii) Manage solid waste according to the following preference hierarchy: reuse, recycling and disposal to designated areas;
(viii) Remove all wreckage, rubbish, or temporary structures (such as buildings, shelters, and latrines) which are no longer required; and
(ix) Request IPIU/DSC to report in writing that the camp has been vacated and restored to pre-project conditions before acceptance of work.

M. Social and Cultural Resources

(i) Strictly follow the protocol for chance finds in any excavation work;
(ii) Request IPIU/DSC or any authorized person with archaeological field training to observe excavation;
(iii) Stop work immediately to allow further investigation if any finds are suspected; and
(iv) Inform IPIU/DSC if a find is suspected, and take any action they require ensuring its removal or protection in situ.

Appendix 4

Photographs of proposed roads

Staring point of Road from Char Murti Chouraha to Pratap Chouraha

Road from Char Murti Chouraha to Pratap Chouraha

End point of Road from Char Murti Chouraha to Pratap Chouraha

Staring point of Road from NH-76 to Lanka Colony

Existing nala at Road from NH-76 to Lanka Colony

End point of Road from NH-76 to Lanka Colony

Staring point of Road from Babji Nagar to NH-27

A religious place at Road from Babji Nagar to NH-27

End point of Road from Babji Nagar to NH-27

Staring point of Road from Civil Lines to NH-27

End point of Road from Civil Lines to NH-27

Staring point of Road from ROB to Charmurti Chouraha

Appendix 5

Photographs of Public Consultations

Public consultations at Charmurti Chouraha

Public consultations at Charmurti Chouraha

Public consultations at Pratap Chouraha

Public consultations at Pratap Chouraha

Public consultations at NH-76 junction at Lanka Colony

Public consultations at NH-76 junction at Lanka Colony

Public consultations at Lanka Colony

Public consultations at Devine Public School near Babji Nagar

Public consultations at Jind Baba Ki Baori

Public consultations near Sahkar Bhavan, Civil Lines

Public consultations near Sahkar Bhavan, Civil Lines

Public consultations near ROB to Char Murti Chouraha road

Public consultations at ROB to Char Murti Chouraha road

Public consultations at ROB to Char Murti Chouraha road

Public consultations at ROB to Char Murti Chouraha road

Public consultations at ROB to Char Murti Chouraha road