SUPPLEMENTARY INITIAL ENVIRONMENTAL EXAMINATION

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PAKISTAN

Provincial Road Improvement Program: Rehabilitation of Sehwan to Dadu Road (32 KM)

Prepared by the Environmental Specialist PMC for the Sindh Works and Services Department and the Asian Development Bank.

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ABBREVIATIONS / ACRONYMS

ITEM	UNITS	DEFINITION
ADB		Asian Development Bank
ADB SPS		Asian Development Bank Safeguard Policy Statement 2009
CEWP		Construction Environmental Work Plan
CO	mg/m^3	Carbon monoxide
dBA	dB	Decibels (A measure of audible noise)
EARF		Environmental Assessment and Review Framework
EIA		Environmental Impact Assessment
EMP		Environmental Management Plan
ES		Environment Specialist of Project Management Unit
GRM		Grievance Redress Mechanism
GFP		Grievance Focal Person
IEE		Initial Environmental Examination
IRI		International roughness index
km		kilometres
Km/h		Kilometres per hour
m		metres
mm		millimetres (1/000 metre)
masl		metres above sea level
NEQS		National Environmental Quality Standards
NO_2	mg/cm^3	Nitrate or Nitrogen Dioxide
PEPA		Pakistan Environmental Protection Agency
PMC		Project Management Consultants
PMC-ES		Project Management Consultants Environmental Specialist
PMU		Project Management Unit
PPP		Public Private Partnership
RAP		Resettlement Action Plan
RoW		Right of Way
SNEQS		Sindh National Environmental Quality Standards
SO2		Sulphur dioxide
SPS 2009		ADB's 2009 Safeguard Policy Statement
SSEMP		Site Specific EMP
TPM	micrograms $/m^3$	Suspended particulate matter, with particles ≥ 10 microns in size, and a danger to lungs. Also referred to as PM10
S-EPA		Sindh Environment Protection Agency

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EXECUTIVE SUMMARY

Government of Sindh with assistance of Asian Development Bank prepared the project for improvement of 328 Km of inter district main roads connecting with National / Main Highways, under the Project named as Sindh Provincial Road Improvement Project (SPRIP).

Government of Sindh (GOS) has taken a loan from the Asian Development Bank (ADB) to improve or rehabilitate up to 328 kilometres (km) of deteriorated roads. The rehabilitation or improvement of 6 road sections is in progress. The project is being administered by the Project Management Unit (PMU), Works and Services Department (WSD) Government of Sindh (GOS), which is headed by the Project Director, PMU has hired the Project Management Consultant (PMC), for Design Review and construction supervision of the civil works.

Under the same ADB loan, the Government of Sindh (GOS) has proposed the rehabilitation and improvement of additional 3 packages for which the Supplementary IEE has been prepared for each additional road package. This Supplementary IEE is for Sehwan to Dadu - District Dadu

The report has been prepared pursuant to the Pakistan Environmental Protection Act 1997, the Sindh Environmental Protection Act 2014 and ADB's Safeguard Policy Statement (SPS 2009).

The improvement of provincial roads involves scarification of the asphaltic wearing course and strengthening of pavement structure by overlaying of aggregate base course and asphaltic concrete base layers. Widening of road pavement and embankment would be done where necessary to achieve desired profile and carriageway width including paved /earthen shoulders. Rehabilitation involves Asphaltic Concrete Wearing Course for better riding quality and capping of pavement structure

Under ADB's SPS 2009 screening and categorization, this road work is classified as category B project, hence an Initial Environmental Examination (IEE) is required. The proposed activities will be confined to the existing road Right-of-Way (RoW). For the purposes of this IEE, potential impacts were considered within a corridor extending some 15 meters on either side of the road center line. Improvement / rehabilitation is to be carried out on existing alignment of project road.

Most of the environmental impacts such as shorter travelling time, better access to market, fuel savings, and less dust are positive and do not require mitigation. The social and poverty impacts of the rehabilitation project are addressed in detail in a separate Resettlement Due Diligence Report. However there are some site specific adverse impacts during project preparation construction and operation which will be mitigated as defined in the report.

Preconstruction Period: Environmental assessment documentation and the Environment Management Plan (EMP) are prepared and approved during the preconstruction period and translated into the local languages for distribution to all stakeholders. The EMP's mitigation (EmiT) and monitoring (EmoT) tables (Annex -1) identify actions to be undertaken by the Sindh Works and Services Department (WSD) and the Construction Supervision Consultant, including a task to brief the selected maintenance staff of the WSD and any contractors on

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the EMP and the actions to be undertaken. PMU will provide a briefing to contractors on the contract and implementation requirements of the EMP.

Construction Period: Construction phase EMP actions focus mostly on contractor's activities, the management of worksites and contractors' equipment and people. Specifically this part of the EMP focuses in defining ways to minimize effects such as dust generation, emission from vehicles and air quality, disposal of spoil and solid waste, noise and vibration from construction machinery, quarry and borrow material transport and disposal, contamination of surface and groundwater resources and work camp management.

Many of the culverts are blocked, damaged or poorly sized. Where there are works on road, the culverts will need to be extended. To gain access to the culvert or to provide for a new culvert, it will be necessary to provide a temporary road diversion, or to close one side of the road at a time and institute traffic controls. Repair of the road once culverts are replaced will follow a specific procedure defined in the EMP It may also be necessary to provide temporary diversion for the water around the area being worked. Ideally the work will be undertaken in dry season when water flows are minimal.

Any mosques, graveyards, hospitals, schools and other sensitive sites that could potentially be affected by the work were identified earlier. In the event, about 6 mosque, one school, one shrine and 5 graveyards were identified with in 100 m of road center during the survey but none of these effected from the project except one mosque for which the carriage is reduced to 5.5 m in order to avoid any damage. However special care would be needed for construction work activities in front of these sensitive receptors. About 12 houses, 1 animal fooder shed and 2 shops impinging in the width of the project road. The impact would be avoided to reduce section width of 5.5 m of main carriageway. More detail description is given in Resettlement Due Diligence Report

There should be no damage to other cultural sites or to any archaeological sites. No trees need to be cut only small bushes and shrubs have to clear off. Appropriate mitigation protocols are defined in this IEE. A detailed inventory of the sites showing the approximate location of the structures is provided in the IEE. By applying careful highway design all other potential impacts can be avoided. However care will need to be taken during construction activity.

Operating Period - Operation period actions focus on confirming that the contractor has completed the EMP tasks required and that the operation of the improved road does not aggravate existing problems such as road safety. Speed limits will need to be monitored by traffic police.

The project has been discussed with local people, government officials and NGO as recorded in the IEE. There was general support for the project, with no serious issues raised. The main concerns expressed were to ensure that local people got employment on the project and that measures were in place to avoid excessive noise or dust during construction. There was also a concern about safety, during construction, but generally a view that improved road conditions would improve safety.

A schedule of activities associated with improvement/rehabilitation has been prepared and the potential environmental impacts of each activity assessed. For each activity, recommended mitigation and monitoring actions have been identified. These are covered in the EMP. All impacts are minor and able to be mitigated. This IEE study authors concluded that the proposed road project will not lead to significant adverse environmental and social

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impacts. Careful implementation of the EMP will ensure that environmental impacts are managed and minimized and the project proponent meets all statutory requirements. The environmental safeguard implementation will have to be monitored by concerned agencies, including the Contractor, the Environment Specialist from the provincial environmental safeguards unit, the PMU and WSD. Due diligence, with mandatory coordination among various stakeholders will further ensure mitigation of any adverse impacts.

The estimated cost for implementing the EMP is Rs 33,66,000 for the contractor for WSD including a 10% contingency.

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I. INTRODUCTION

A. The Project

1. Government of Sindh with assistance of Asian Development Bank prepared the project for improvement of 328 Km of inter district main roads connecting with National / Main Highways, under the Project named as Sindh Provincial Road Improvement Project (SPRIP).

2. Government of Sindh (GOS) has taken a loan from the Asian Development Bank (ADB) to reconstruct or rehabilitate up to 328 kilometres (km) of deteriorated roads. The rehabilitation or reconstruction of 6 road sections is in progress which is given as under-:

Table 1: Road Packages under SPRIP

S/No.	Description	No. of Package	Total Length (km)
1	Thull to Kandhkot Road	ICB-SPRIP-01	44.00
2	Sheranpur to Ratodero Road	ICB-SPRIP-02	36.00
3	Khyber to Sanghar Road	ICB-SPRIP-03	64.00
4	Sanghar to Mirpur Khas road	ICB-SPRIP-04	63.00
5	Tando Mohammad Khan to Badin	ICB-SPRIP-05	67.00
6	Digri to Naukot Road	ICB-SPRIP-06	54.00

3. The project is being administered by the Project Management Unit (PMU), Works and Services Department (WSD) Government of Sindh (GOS), which is headed by the Project Director, PMU has hired the Project Management Consultant (PMC), for design review and construction supervision of the civil works.

4. Under the same ADB loan, the Government of Sindh (GOS) has proposed the rehabilitation/improvement of additional 3 packages. The additional packages are given as under-:

1. Jahan Khan to Faizu Larro via Chak-Rustam - District Shikarpur
2. Sehwan to Dadu-Moro Road- District Dadu
3. Tando Allahyar to Chambar – Tando Allahyar

Table 2: Additional Road Packages

S/No.	Description	Total Length (km)
1	Jahan Khan to Faizu Larro via Chak-Rustam - District Shikarpur	29.1
2	Sehwan to Dadu-Moro Road- District Dadu	32.00
3	Tando Allahyar to Chambar – Tando Allahyar	19.00

5. A Supplementary IEE has been prepared for each additional road package. This Supplementary IEE is for Sehwan to Dadu - District Dadu

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B. Purpose and Scope of the IEE

6. The purpose of this Supplementary IEE is to identify potential impacts (beneficial and adverse) during all stages of the road improvement and rehabilitation project, list actions that will prevent or at least mitigate any negative effects of the work and specify in monitoring programme for implementation by the Works and Services Department (WSD), ensuring that the actions discussed in the IEE are carried out in a credible and timely manner.

7. This Supplementary IEE has been undertaken pursuant to the Pakistan Environmental Protection Act 1997, the Sindh Environmental Protection Act 2014 and ADB's Safeguard Policy Statement (SPS 2009).

C. Regulatory Framework and Environmental Classification

1. Pakistani Regulations

8. The Pakistan Environmental Protection Agency (Review of IEE/EIA) Regulations 2000 ("the PEPA regulations"), together with section 12 of the Pakistan Environmental Protection Act 1997 requires that every new development project in Pakistan is preceded by an environmental examination, leading to either no further action, an Initial Environmental Examination (IEE) or Environmental Impact Assessment (EIA) depending upon the magnitude of the project and severity of impacts anticipated during construction and once the project becomes operational. The SEPA Regulation classifies all road rehabilitation and reconstruction, including reconstruction of existing paved roads as Category C, meaning that no environmental assessment is necessary and only a short justification statement need be submitted to the Sindh Environmental Protection Agency (S-EPA).

9. Other Pakistani regulations that apply are: the National Environmental Quality Standards (NEQS) 1997 and various amendments which makes it illegal to discharge any effluent or emit air pollution or noise exceeding the National Environmental Quality Standard; the Sindh Wildlife Protection Ordinance 1972, the Wild Bird and Animal Protection Act 1992 and various other amendments which make it illegal to undertake any project activity inside a protected area (national park, wildlife sanctuary, or game reserve) or to hunt or poach wildlife without special permission; the Cutting of Trees (Prohibition) Act 1992 which makes it illegal to cut or chop down trees without the prior permission from the Forest Department; and the Antiquities Act 1975 which prohibits new construction in the proximity of a protected antiquity and empowers the GoP to prohibit excavation in any area that may contain articles of archaeological significance. These Acts must be well understood by contractors, who must ensure compliance by their workers.

2. ADB Safeguard Policy and Project Classification

10. ADB's Safeguard Policy Statement (SPS 2009) consists of three operational policies on the environment, indigenous people and involuntary resettlement. SPS

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2009 provides information on good practice approaches to implement safeguards. Overall this policy aims to avoid or mitigate adverse environmental and social impacts, including protecting the rights of those likely to be affected or marginalized by the development process.

11. An initial screening of the project roads was undertaken to assess the potential impacts and risks. It was concluded that there will be limited, generally site-specific and reversible impacts that can be readily addressed through mitigation measures. In line with SPS 2009, this project is therefore classified as environment Category B and this IEE (including its Environmental Management Plan (EMP)) has been prepared consistent with ADB requirements for a category B project.

D. Methodology

1. Baseline Physical, Environmental and Social Data

12. The first task was to assemble all existing data on the road's physical condition and the proposed maintenance and rehabilitation actions to be applied. Using this knowledge, the project's corridor of impact – generally considered to extend 15m each side of the carriageway centreline – was identified and the existing ecological and social condition recorded. These data formed the baseline against which possible changes due to construction were defined.

13. The environmental assessment team completed a number of site visits to the road corridor to collect baseline environmental (physical and ecological) and social data.

2. Literature Review/Baseline

14. Legislative and regulatory requirements pertaining to the project were reviewed along with other available data and previous IEE/EIA studies conducted in the region. Studies reviewed included the following:

- Environmental Impact Assessment Study for Sindh Cities Improvement Investment Program
- Environmental Impact Assessment for 6th Secondary Transmission and Grid (STG) project in Lower and Upper Sindh (WB Assisted)
- Environmental and Social Management Framework for Sindh Enhancing Response to Reduce Stunting Project (P & D department Govt. of Sindh)
- ADB Assisted Flood Emergency Reconstruction Project (FERP), Upper Sindh Package Loan 2742-Pak, Initial Environmental Examination (IEE) Prepared by ECIL for Sindh Works and Services Department Government of Sindh, November 2011.
- PAK: Power Sector Rehabilitation Project (Guddu Thermal Power Station) 2012, Assisted by ADB
- National Highway Development Sector Investment Program-Tranche3; Assisted by ADB; Environment Impact Assessment Study of Nasanabdal Havelian road Section E-35; Draft Report March 2012.

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- Road assessment Program India; Initial Environmental Examination report Assam; Project no 37066; Prepared by Ministry of Rural Development for ADB; June 2008.
- Asian Development Bank, Safeguard Policy Statement Guideline; June 2009.

3. Impact Identification

15. The activities to be undertaken in conjunction with or arising from the improvement or rehabilitation of the Project road were enumerated and the environmental impact of each action was assessed, taking into account the road's location and the existing environment. The measures were proposed to mitigate the negative impacts and to enhance the positive impacts.

16. The potential impacts and mitigation measures were assessed covering the following parameters:

- Environmental problems due to the Project location (i.e. location of different components of the Project)
- Environmental problems related to design
- Environmental problems associated with the construction stage
- Environmental problems resulting from Project operation

4. Mitigation Measures and Environmental Management Plan

17. For each action with potential impacts, a mitigative measure, and action to either prevent or minimize negative effects, was identified and a monitoring requirement specified. These were compiled into a comprehensive Environmental Management Plan (EMP) which also identifies where and when actions will need to be undertaken and who will be responsible.

18. The list of activities, impacts and mitigative measures is included in the EMP (Chapter 8 and Annex 1)

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II. PROJECT DESCRIPTION

A. Project Description

19. The project is to rehabilitate the provincial highway artery connecting Dadu town and Sehwan Sharif via Talti. It off takes from Indus Highway N-55 at about 4 km from Sehwan Sharif and passing through villages of goth Ali Khanan at Chainage KM04+200, Wada Manhayoon village at chainage KM 16+200 and Khushk Morr. The existing width of road is 3.65m having already available ROW of 110 ft owned by Provincial Highways Division of Works and Services Department GOS. The existing earthen shoulder width varies from 1.75 to 4.0m.

B. Existing Condition of Project Road

20. Road surface condition is continuously deteriorating and needs immediate rehabilitation and widening to facilitate comfortable driving conditions and to avoid accidents particularly in villages and bazars located on the project road.

C. Rehabilitation/Improvement to be Undertaken

1. Scope of Work

21. The scope of work consists of widening of main carriageway from 3.65 m to 7.3 m with up to 1.5 m paved shoulders on either side. In town/village areas the shoulder width will be reduced to make it compatible with the available width. The subproject will also improve/rehabilitate bridges and culverts, i/c widening of bridge at MNV drain at chainage KM 06+200.

22. This section describes the steps required for both rehabilitation and improvement, and the EMP provides for either or both actions to be taken. A full list of maintenance, rehabilitation and improvement actions, impacts and mitigations are included in the EMP

23. The proposed activities will be confined to the existing road right-of-way (RoW). For the purposes of this IEE, potential impacts were considered within a corridor extending some 15 meters on either side of the road centre line. Both rehabilitation and reconstruction within the existing carriageway are category B works.

2. Improvement of existing carriageway

24. The improvement of provincial roads involves scarification of the asphaltic wearing course and strengthening of pavement structure by overlaying of aggregate base course and asphaltic concrete base layers. Widening of road pavement and embankment would be done where necessary to achieve desired profile and carriageway width including paved /earthen shoulders. Rehabilitation involves Asphaltic Concrete Wearing Course for better riding quality and capping of

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pavement structure.

Figure 1: location of the Project road

25. The main steps involved in improvement of section of road are:

i. Clear vegetation on the existing shoulder and 40 cm beyond the base of the shoulders (widened if required) to provide clear access to the construction site.

ii. Remove and dispose of existing bituminous surfacing. Unsuitable or contaminated base and sub base material is also to be removed and transported to an approved disposal site.

iii. Use borrow materials to repair the existing earthen shoulder. The shoulders shall be graded, watered and compacted to a specific density.

iv. Use recycled or new crushed aggregate to provide a compacted aggregate base course over the width of the pavement (depth may vary as per profile)

v. Lay an asphaltic concrete base course (depth may vary as per profile)

vi. Lay a 50 mm asphaltic concrete wearing course

vii. Place 150mm aggregate base course on the earthen shoulders and grade and compact to level with the top of the wearing course.

viii. Apply road markings and install signage and safety barriers as applicable

ix. Undertake any planting as appropriate

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3. Rehabilitation (Overlay)

26. Rehabilitation involves scarifying the current riding asphalt layers and providing an overlay of new asphalt base and riding courses. The key steps are:

i. Clear vegetation on and up to 40cm from the base of the shoulders to provide clear access to the construction site

ii. Use borrow materials to repair the existing earthen shoulder. The repaired shoulders shall be graded, watered and compacted to a specific density.

iii. Any localized potholed cracked, distressed stretches / areas the patch work in full depth of existing bituminous layer(s) will be carried out before laying of new asphalt concrete layer.

iv. Scarify existing bituminous surfacing. Material removed is to be transported to an approved disposal site.

v. Lay an asphaltic concrete base course (depth may vary as per profile)

vi. Lay a 50 mm asphaltic concrete wearing course

vii. Place 150mm aggregate base course on the earthen shoulders and grade and compact to level with the top of the wearing course.

viii. Apply road markings and install signage and safety barriers as applicable

ix. Undertake any planting as appropriate

4. Rectification of Bridges

27. The project road crosses MNV drain and Dadu Canal bridge and involves the reconstruction of MNV drain bridge and rehabilitation of Dadu Canal bridges.

5. Reconstruction and Rehabilitation of Culverts

28. Many of the culverts are blocked, damaged or are inadequate. To gain access to the culvert or to provide for a new culvert, it will be necessary to provide a temporary diversion or to close one side of the road at a time and institute traffic controls. It may also be necessary to provide a temporary diversion for the water channel. Ideally the work will be done in dry season when water flows are minimal.

29. The steps for repairing or replacing culverts is as follows:

- All vegetation shall be removed from culvert inlet and outlet up to 5m, from either side.
- Where water channels have to be diverted or construction, this will be done during the dry season and new culverts will be placed on a 30 cm thick sand cushion.
- Where culverts needs extension, provide a 300 mmm sand cushion and place lean concrete as a base,
- New reinforced concrete slab culvert to be provided as per the drawings, Re decking of culverts as and where applicable

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- The masonry side walls shall be deep pointed including replacement of parts of masonry which has deteriorated and re-laid with good quality bricks and mortar.
- In the base slab all pitting shall be rectified by providing bonding agent and a 75mm thick concrete cover with 10mm diameter bars placed at 250mm centres. Anchor bars shall be drilled into the base slab. The anchor bars shall be 13 mm diameter placed 600 mm centres and drilled 150mm into the base slab.
- The top slab shall be examined for any cracks which shall be repaired with epoxy injection.
- Where the concrete cover has broken and steel reinforcing is exposed, the area shall be marked and all rusted reinforcement shall be removed and replaced by better quality new steel of the same size and area and nailed to the concrete surface. In such areas, concrete shall be chipped to at least 75mm in thickness, a bonding agent shall be applied and concrete shall be applied in the form of plaster. Steel rods 15mm in diameter shall be drilled into the old concrete at 450mm centres and grouted.
- After rectification work is carried out all the areas shall be coated with a polymer reinforced cementitious waterproofing compound.
- The roadway and shoulders shall be restored following section II.C.2 above.

D. Construction Materials

30. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank.[1]

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III. DESCRIPTION OF ENVIRONMENT

31. The description of the environment of the project roads requires baseline data on the following:

- Physical Environment
- Ecological Resources
- Socioeconomic Environment

A. Physical Environment

1. Topography Geology and Soil

32. Geologically, Sindh can be divided into four distinct parts with the dry and barren Kirthar Range in the west, a central alluvial plain bisected by the Indus River, a desert belt in the east, and the Indus delta in the south. The entire project area is located in the central alluvial plain on eastern side of the Indus River.

33. Topography of the project area is predominantly flat with mild slope towards the south.

34. The soil contains varying proportions of clay and sand. New deposition is almost pure sand, which becomes stable through continuous deposition of silt and then becomes able to sustain agriculture and trees.

2. Climate

35. Dadu has a hot desert climate with extremely hot summers and mild winters. From April onwards, the summer season continuous usually up to the middle of October after which it becomes cool and the day temperature also begins to recede. May, June and July are the hottest months. The months of August and September are stuffy and suffocating due to higher humidity levels. The winter months are December, January and February.. The temperature remains high during the months of June, July and August and sometimes reaches up to 50 °C.

36. The coldest month is January in which the mean maximum temperature is 25 °C and the mean minimum temperature is 14.0 °C June is the hottest month with the mean maximum temperature near 48 °C and the mean minimum temperature as 36.0 °C. The temperature records are from last 9 years i.e. 2009 -2017 taken from worldweatheronline.com (last visited on 14-03-2018)

37. The average annual rainfall during the last 09 years period from (2009-2017) works out to be 70 mm. Nearly 85% of it received in the form of high intensity showers during the monsoon (July, August, September) and the remaining in winter.

38. The wind direction in summer is towards south and southwest; whereas in winter it is towards north and northeast. The dust storms and hot winds blow continuously during the months of March and May.

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3. Water Resources

39. Shikarpur is situated in tropical and most drought affected zone. Its lands are mostly irrigated with the network of non-perennial and perennial canals. The proposed road crosses the Guddu and Sindh canal and number of small water courses. A number of water ponds also exists on either sides of the proposed road. These ponds are used to aquaculture fish and also acting as quasi wetlands at a very localized level. The mitigations will be needed in order to protect the ponds and canals by construction of temporary fences to prevent accidental damage releases to the surface water bodies.

40. Dadu is situated in tropical and most drought affected zone. Its lands are mostly irrigated with the network of non-perennial and perennial canals. The proposed road crosses the MNV drain and Dado canal. A number of small water courses run in the project area and exists on either side of the proposed road. The mitigation measures will be needed which include construction of temporary fences and isolation technique to prevent accidental damage to the both outfall drain and canal.

41. The ground water is present at the depth of 20 to 40 m below Natural Soil Level (NSL). The quality of ground water isn't been tested although in accordance with the preliminary survey, mostly the ground water is brackish, un-hygienic and unfit for human consumption.

4. Air Quality and Noise

42. The Sehwan To Dadu road is located in a rural area and human activity is primarily related to agriculture and fishing in water ponds. At present, major sources of air pollution and noise are mobile sources such as, Old vehicles, Combustion, Old Dumpers/Trucks and other sources include wood burning, agriculture burning, and open burning of municipal solid waste. Some dust is generated when vehicles overtake on unpaved shoulders. The incidence of this happening should be reduced with the Project.

43. Since WSD has not yet established its own environmental monitoring capacity, there are no air quality and traffic noise monitoring data available for existing roads in Sindh Province.

5. Seismicity

44. According to the seismic zone map of Pakistan, the Project Area lies in the zone where minor to moderate damage can occur as shown in **Figure 2.**

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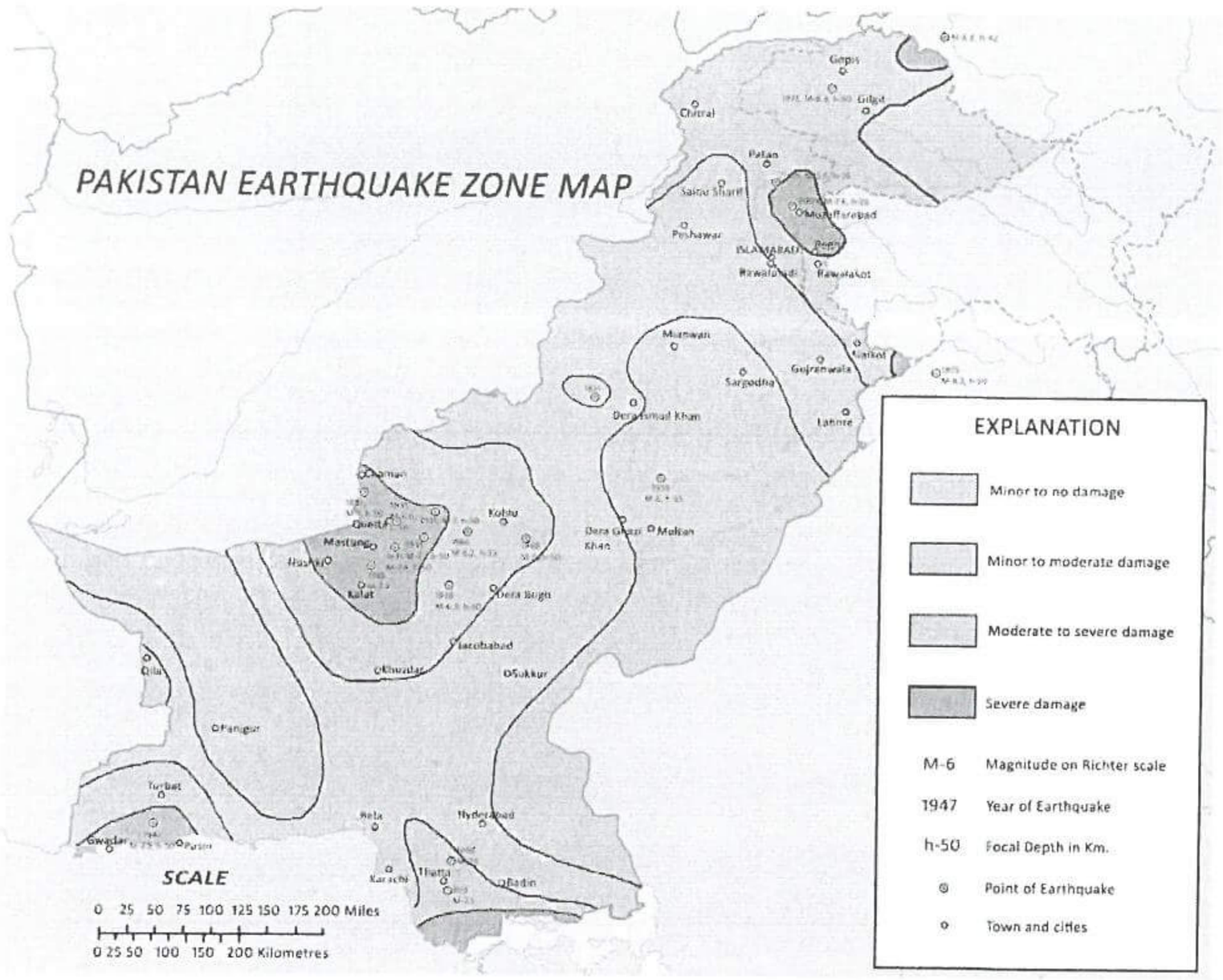

Figure 2: Pakistan Earthquake Zones

6. Archaeological and Cultural Resources

45. In order to identify potentially sensitive community structures, a survey of the Project impact area was undertaken between August 2018 and Sept 2018. Structures were identified through direct observation and by interviewing those living within the project area. Most of the structures were located near towns and urban areas.

46. Mosques, shrines and graveyards are of historical, cultural and religious importance for the people. About 6 mosque, one school, one shrine and 5 graveyards were identified with in 100 m of road center during the survey but none of these effected from the project except one mosque for which the carriage is reduced to 5.5 m in order to avoid any damage

7. Sensitive Receptors

47. About 6 mosque, one school, one shrine and 5 graveyards were identified with in 100 m of road center during the survey but none of these effected from the project. However special care needed with speed limit and noise controls during construction in front of sensitive receptors

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B. Ecological Resources

48. Due to the high intensity of human settlement, land cultivation and industry, undisturbed natural habitats are very limited. There is nevertheless still significant plant and animal diversity.

C. Flora

49. Flora of the project area falls in the scrub Dry Tropical Thorn Forest Zone. This is the natural vegetation of the Indus Basin. It has the capacity to survive and grow in areas with extremely high temperatures and low precipitation.

50. The flora consists of thorny and hard wooded species. Acacia species are the dominant one. The trees usually have short boles and low branching areas. Their usual height is 6-9 metres. The leaves are small, except in a few genera like Salvadoran and Caltrops.

51. Main trees in the Project Area are Acacia nilotica (Keekar), Eucalyptus camaldulensis (Safaida), Phoenix dactylifera (Date Palm), Dalbergia sissoo (Shisham). Azadirachta indica (Neem), Salvadora oleoides (Peelu) and Ficus religiosa (Peeple).

52. Tamarix dioica (Lai), Calotropis procera (Akk), Aerua javanica (Bui), Salsola barysma (Chota Iona), Zizyphus nummularia (Mallah) and Prosopis julflora (Mesquit) in bush form are seen in abundance along the roadside.

53. Among fruit trees Date Palm, mango and Beri can be seen on sides of the road.

D. Agriculture

54. The crop pattern during the Rabbi season is Wheat, Barley, Gram, Pulses while during the Kharif season is Rice, Sugarcane, Cotton Jowar. Among vegetables turnips, radish, potatoes, peas, spinach, carrot and lady finger are grown in the area. Onion is another major vegetable grown in the Project Area.

E. Fauna

55. At present jackal, squirrel, fox, rats and mongoose are reported to be found near the project area. Bats, especially of the genera chiropteran are also seen in the area. Important bird species found in the project area are common crow, common mayna, house sparrow and common teal. Grey and black partridges also found in the project area but their population have been significantly reduced due to excessive hunting.

56. The reptiles found in project area include snakes like cobra, rattle snakes and rat eater snakes. Small and medium sized lizards are also a common sight in the area.

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These include spiny tailed lizard (Uromatix hardwickii) and fringed toed lizard (Acanthodactyluscontoris).

57. Turtles are also present in the area especially in the vicinity of moist lands, ponds and during rainy seasons.

58. Domestic animals include goats, sheep, camel, cows and buffaloes. Presence of many water ponds in and around the project area, though problematic for agriculture, has been instrumental in improving the numbers and productivity of buffaloes. Another important domestic animal of the area is donkey, which is used for pulling carts, etc

F. Ecosystems

59. Ecosystems include protected areas such as wildlife sanctuaries, national parks and game reserves. There is no protected area such as forest, game reserve or wild life sanctuaries along the route of proposed rehabilitation road. The nearest forest reserve i.e. Kunda reserve forest is present at distance of 5 KM from Goth Gulam Sulangi at off take point of road.

60. Mancher lake is present around 5 KM Goth Gulam Sulangi at off take point of road and one of the largest fresh water body in Pakistan. The area of the lake fluctuates with the seasons from as little as 350 km² to as much as 520 km². The lake collects water from numerous small streams in the Kirthar Mountains and empties into the Indus River.

G. Socio-Economic Environment

1. Road Transport

61. Transport in the form of Vans, pickups, trolleys and buses. Most of the people do have their own transport. Access to the Project is quite easy through N-55 at Sewen and link road of Dadu from N-5.

2. Structures Affected

62. During the resettlement survey a small number of structures were found to effected in the Sehwan To Dadu road RoW. About 12 houses, 1 animal fooder shed,1 mosque and 2 shops impinging in the width of the project road. Most of these have encroached on the pavement. Details of structures affected, strategy and protection measures are provided in Resettlement Due Diligence Report. These encroachments are illegal but if people are moved or cultivated land is taken, compensation under SPS 2009 and ADB's Involuntary Resettlement Guidelines is nevertheless required. Resettlement is the subject of a separate land acquisition and resettlement plan (LARP)

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3. Drinking Water

63. During the survey it was learnt that the water supplied by municipal authorities in the project area is generally not suitable for drinking due to inadequate treatment. Most drinking water is ground water, but some communities and villages are totally dependent on surface water as well. The quality of ground water isn't been tested although in accordance with the preliminary survey, mostly the ground water is brackish, un-hygienic and unfit for human consumption.

4. Industrial and Commercial Activities

64. There is no heavy industry in the project area. There are a number of secondary industries within the district that support the agricultural economy such as rice husking, a sugar refinery, Cotton ginning and flour mills. There are also some brick kilns.

5. Employment and Income Sources in Project Area

65. Nearly all employment in the project area is in the agriculture or agriculture product processing sector and aquaculture. Most common jobs involve harvesting, picking, threshing, animal rearing transport driving and guarding. Local labourers commonly gain employment during the sugarcane harvesting season for crop harvest, loading and transport. Sugar mills in the surrounding area also employ skilled and unskilled labour. Various sugar mills and cotton gins create employment and continue to contribute significantly to the local economy.

66. Agricultural lands are owned by landlords and farmers work for a share of the crop. They live in the fields in small houses made from wet soil, cow dung and palm leaves. They graze cattle and grow vegetables for food.

67. Market places are typically located adjacent to the main roads where economic activity is highest. The grain and cattle markets are open every day except Fridays. Shops in the market places are mostly grocery shops and small hotels and are typically owned by local people. Smiths, workshops, hardware commodities and other house-hold items are available from stores in these markets.

68. Those not employed in agriculture include cobblers, carpenters, blacksmiths and barbers with lower incomes. Their daily wage is between Rs. 400 and 500, however, economic opportunities are limited and people face difficulties finding employment other than irregular temporary work. They are usually uneducated.

69. Agriculture is the most widespread source of income in the project area (65% of all income). Thirty percent of the population earn income as shopkeepers, small business, and as labourers in the cotton and rice industry and 5% are in government jobs in departments such as the agriculture department, forest department, post office, police, transport and the Pakistan army.

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6. Demography

70. District Dadu has a population of 1550266 with a growth rate of 1.79 % (1998-2017) as recorded in 2017 Census. The percentage of male are 51.4 % while female is 48.6 %. Seventy Five (75) % of population resided in rural areas and 25 % lived in urban areas. Average household size was 6.8.

71. Sindhi is mother tongue of the residents. Shalwar kameez and dothi kurta are the common dresses of males and females. Some modern young males also wear pants and shirts.

72. Tribal people include Jamali, Khoso, Bijarani, Kandrani, Domki, Jatoi, Mazari, Dahani, Malik, Lashari, Syed, Shaikh, Soomro, Jakhrani, Bhutto, Bheel.

IV. POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

A. Design and Pre-Construction Phase Impacts

1. Lack of Environmental Capacity

73. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank.

2. Lack of Integration of IEE/EMP Requirements into Construction Bid Documents

74. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank.

3. Loss of Vegetation and Trees

a) Description

75. There are various trees located on the both sides of the Sewen To Dadu Road. As per the resettlement survey, no tree will be effected due to rehabilitation/improvement of the current road. However, the bushes on road sides shoulders have to clear off .

b) Mitigation Measures

76. New plantations will be included in the design of the right of way and trees will be replaced at a ratio of three trees planted for every tree cut down ,and which is more than 10 cm Diameter Breast Height (DBH) .

4. Top Soil Erosion

77. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

5. Disturbance to Archaeological and Cultural Sites

a) Description

78. There are no archaeological sites found in the proposed Sewan to Dadu road and thus no mitigation measures are required.

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6. Material Haul Routes

79. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

7. Consultation Plan with affected roadside landowners

80. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

8. Contractor's Environmental safeguards Capacity

81. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

B. Construction Phase Impacts

1. Dust Generation: Transport of Materials

82. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

2. Dust Generation: Quarry and Batch Plant Operations

83. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

3. Topsoil Erosion

84. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

4. Emissions from Vehicles Exhaust

85. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road

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5. Disposal of Spoil and Solid Waste

86. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

6. Noise and Vibration

87. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

7. Quarry /Borrow Material

88. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

8. Contamination of Water Resources (Surface and Ground)

a) Description

89. Lubricants that enter the ground environment can render the area unusable and may pollute groundwater. Agriculture fields, aquatic systems, community owned stream channels and canals can be polluted by fuel and lubricants entering these systems.

90. Materials brought onto the site will generate a range of possible environmental pollutants for water resources. The main concerns will be from containers such as bitumen drums and plastic that may be brought on site as wrapping material if they are not properly disposed of.

91. During rehabilitation work on culverts and bridges the canals and water courses crossed the Sewan to Dadu road, could become polluted by scarified material and accidental discharge of cement and other chemicals like epoxy and paints.

92. The construction activities will increase the suspended solids and turbidity of the water bodies. Clearing and grubbing (where necessary) on certain stretches will promote soil erosion in the nearby surroundings. The eroded and unstable soil during the rainy season will increase sediments concentration in the surface water. This impact will be of temporary nature.

b) Mitigation Measures

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93. Fuel and oil storage areas should be located at least 250m away from any watercourses and be provided with a concrete platform and be bounded with interceptor traps so that any fuel leakage is retained within the site. Wash down water from machinery repair areas also needs to be directed into this system and held in retention areas for treatment. Refuelling should, wherever possible, be carried out at the fuel storage area and not be permitted within or adjacent to watercourses. When the facility is no longer required the contractor will need to remove the structures and also excavate and remove any contaminated soil for disposal at an EPA approved site. New soil should be brought in as required so that the ground surface is re-established.

94. Hazardous waste from the camps including oil, grease etc. should be transported through hauling trucks to proper disposal or transportation to a transfer station.

95. Proper solid waste management system will avoid the contamination of surface water due to solid and hazardous waste.

96. During construction stage of the Project a proper surface, ground, spring and wastewater sampling and testing should be carried out for the Study Area to verify the existing conditions of these resources.

97. Asphalt should not be applied during heavy rain so as to avoid it being washed into watercourses.

98. Water channels must be diverted properly and a protection mechanism provided.

99. Alternatively, construction should be undertaken during the dry season.

100. Water channels will be monitored for their quality against "irrigation water quality standards" of Water and Power Development Authority, WAPDA. Ground water quality will be monitored against National Drinking water quality standards

9. Damage / disturbance to Utilities Services

a) a) Description

101. Utility services within the RoW may include electrical cables, telephone lines and gas pipelines. It is possible that road rehabilitation and reconstruction will disturb/damage these.

b) Mitigation Measures

102. A relocation plan of the utilities will be developed during the preparation of the LARP or Resettlement Due Diligence Report. The Contractor will need to be aware of the location of these services so that disruptions are not caused. Placing the responsibility for any repair of the services with the Contractor will assist in avoiding damage to these services.

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10. Traffic Disturbance

a) Description

103. Construction work will require traffic to be diverted around areas, or delayed while work is being done.

b) Mitigation Measures

104. A traffic diversion plan will be developed by the contractor and approved by the Construction Supervision Consultant. Same plan will be the part of Site Specific Environmental Management Plan. Proper warning signs and flags will need to be displayed at the commencement of any road construction or diversion section so as to alert drivers to the changed road conditions. Old signage should be removed to reduce confusion, as soon as the work is done. This will be the responsibility of the Contractor.

11. Health and Safety Concerns

105. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

12. Interruption/ Contamination of Water channels

a) Description

106. There are 2 main water canals and number of watercourses crossing the project road. Repair or replacement of the crossing will often require temporary diversion of, or work within, the watercourse. This could affect the water supply to agriculture land of communities living nearby, and could lead to contamination.

107. Temporary traffic diversions disrupt and can be a danger to traffic.

b) Mitigation Measure

108. Where water crossings are being repaired. The water channel should be diverted or a protection mechanism provided to avoid contamination. Where possible, construction will be made in dry season.

109. The contractor should provide an adequate sized diversion so that there shall be no disturbance to water flows of canal /water course.

110. A traffic management plan shall be provided by the contractor. Signage and lighting may also be provided to reduce the likelihood of accidents.

111. The land used for the temporary diversion and the water course shall be restored as far as possible to its initial state once the work has been completed

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13. Burden on Local Resources

a) Description

112. A labour force that is not properly supplied with adequate rations or cooking/heating fuel will aggravate demands on local supplies of fuel wood and wildlife. The project labour force can impose a burden on community water supply and sanitation systems.

b) Mitigation Measures

113. Where possible, local labour will be hired for the project so there will be no additional impact on natural and social resources and services. At all times workers must be supplied with the required daily rations or a living allowance as per their contract and at the same time contractors will be required to inform employees in writing about the consequences of illegal hunting, including the loss of a job and possible detention by local authorities.

14. Inadequate Camp Site Good Housekeeping

a) Description

114. While the use of local labour should minimise the need for on-site worker accommodation, there will nevertheless be a need for a work camp with office accommodation, catering, ablutions, prayer area, etc

b) Mitigation Measure

115. The contractor will be responsible for the construction, management the operation of the construction work camps to minimize the impact of construction activities on land; ensure adequate provision of waste disposal and health and safety of construction workers. The contractor will carry out the following activities to manage the disposal of construction waste.

- Train work force in storage and handling of materials
- Fire fighting
- Camp sewage will be treated in soaking pit and garbage management, by provision of EPA-compliant means of disposal.

116. Contractor will prepare as part of site specific EMP following which will be approved from EA and final approval will be sought form ADB.

- Traffic management plan
- Waste management plan
- Borrow site management plan
- Camp site management plan
- Mosque relocation plan / approval

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C. Operation Phase Impacts

117. Most of the impacts at the operation stage are positive and do not require mitigation. These include:

- Improved access to markets
- Reduced travel times
- Lower vehicle operating costs
- Reduced dust

118. However there are some negative impacts and these are listed in the following sections.

1. Lack of Environmental Safeguards

119. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

2. Increased Traffic Volumes

a) Description

120. The Consultant's traffic forecast predicts an increase in traffic of up to 20% as a result of the road improvement. This brings with it increased noise and emissions, increased risks associated with the transport of materials and increased interaction with pedestrians and non-motorised transport.

b) Mitigation Measure

121. Traffic calming measures and speed limit signage will be provided to reduce the impact of the traffic through populated areas. Crossing areas will be marked and amber flashing lights installed in urban areas, when full traffic signals are not warranted.

3. Increased Risk of Accidents

a) Description

122. While the proposed road improvements will make the road safer in some respects, the increase in traffic and the potential for higher speeds may result in more road accidents especially in urban areas where there is a potentially dangerous mix of non-motorized, two, three and four-wheel traffic using the same carriageway.

123. The road design has had to balance the requirements of SPS 2009 to minimise displacement of encroachers and land acquisition against road safety

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b) Mitigation Measures

124. Improved traffic signage and road markings will be used to warn motorists of impending changes in road standards and to advise appropriate speeds

125. Properly designed traffic calming measures such as speed humps, speed signs and, possibly traffic signals will be installed within settlements.

126. Traffic police should be trained to more consistently enforce road rules.

127. One of the most effective ways of reducing deaths from road crashes is to reduce the time between the trauma occurring and hospital treatment. To this end an emergency ambulance provided by the local authorities would be the most effective. Failing that, better enforcement of the road rules and more stringent penalties should be sought.

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V. GRIEVANCE REDRESS MECHANISM

128. Reference to the Report Initial Environmental Examination Provincial Road Improvement Program: Rehabilitation of the Jacobabad to Rotadero Road Prepared by Prepared by the Engineering Consultant International Pvt. Ltd. (ECIL) for the Sindh Works and Services Department and the Asian Development Bank

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VI. PUBLIC CONSULTATION

A. Objectives of Public Consultation

129. The overall objectives of the consultation process were as follows:

- To inform all interested people on the likely positive and negative effects of the road project and encourage feedback from stakeholders on IEE findings, principally the impacts and proposed mitigation measures;
- To gain a consensus on the impacts identified, their importance and the relevance and effectiveness of the mitigation measures proposed;
- To provide confidence that all relevant issues and mitigation measures have been identified, agreement that the mitigation measures are adequate, and that nothing significant has been missed;
- To enable incorporation of stakeholder views and concerns in the IEE.

B. Consultation Process

1. Scope

130. The environmental consultants conducted meetings with local people, NGOs and government departments. During these meetings a description of the project (appropriate to the audience) was given, along with an overview of the project's likely social and environmental impact.

131. The interviews with the local people, government representatives and NGOs were based on issues such as solid waste management, wastewater, forest, wildlife and archaeological sites whereas discussions with general public concentrated on their concerns relating to the project and likely impacts during the construction and operation phases. These included both environmental and concerns.

2. Community Consultations

132. Community consultations consisted of formal and informal meetings at Shikarpur city. The meetings was conducted on dated 05.03.2018 to 07.03.2018. The consultation exercise was conducted in both Sindhi and Urdu languages. A non-technical oral description of the project was given providing an overview of all likely positive and negative impacts. Following which, an open discussion was held so that the participants could voice their concerns and opinions. All participants were encouraged to voice their concerns and opinions. Participants were also asked to suggest alternatives where they had particular concerns.

133. Feedback obtained from the stakeholders was documented, and all issues and suggestions raised were recorded in survey forms. Both social and

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environmental issues were raised. The social issues are discussed in more detail in the Resettlement Due Diligence Report

134. The people interviewed had only minor worries and generally agreed that most effects would be temporary only. Some common concerns regarding the shortage of electricity, potable and non-potable water, wastewater disposal, traffic congestion, poor roads, minimal employment opportunities, and security issues were raised. None of these issues related specifically to road improvement but were general complaints. All appreciated the project and said that it would boost the value of property, while some said that business, economic and employment situation in the area will also improve.

135. A matrix of concerns raised by community members was prepared (**Table 3**). A pictorial record of the meetings is included as Annex -2

Table 3: Summary of Concerns Raised During Stakeholder Consultations

Issues	Concerns raised by community	Remarks
Dismantling permanent structures	The dismantling of permanent structures specially mosque, shrine should be avoided	No permanent structure will be effected due to construction of proposed road.
Mobility of Locals	safe and free mobility of locals especially women and children as well as safety measures to be taken during construction activities.	Proper arrangements should be made for smooth and un–interrupted flow of traffic passing through the road during the construction of the project works. All signboard should be displayed and number of sign board should be increased in areas of settlement
Loss of Livelihood	The business of the people should not be affected due to project activities. Local skilled and unskilled labor should be employed in the project works.	Proper traffic management plan will be develop and implemented in order to avoid traffic blockage that may impact the local business Seasonal traffic has been taken into account. Skill and unskilled jobs will be given to locals people where possible. Training will be provided
Safety of Community	Speed Restrictions, Traffic police may be deployed Flagmen need to be in place for traffic control, which is thought particularly important for the towns located along the roadside.	International Safety Standards for the road safety and community safety shall be adopted and maintained.
Interaction / Conflict with local community	Immigrant workers may be of different backgrounds and culture or they may involve in the illegal activities in the area and conflict between the community and worker may occur	Immigrant workers should be well scrutinized before their deployment in the project area.
Medical Facility	Unavailability of Medical Facility	Reconstructed road will improve

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Issues	Concerns raised by community	Remarks
		access to existing facilities
Dust, loss of trees and agricultural land	Existing damaged road creates lot of dust Trees and farmlands near the RoW should be protected leftover construction material shall be collected at completion of the activity	Dust will be reduced when road has been re-constructed Disturbance to trees and farmland will be minimal
Other issues	Minimizing the construction duration Road should be rehabilitated as early as possible Traffic congestion due to damaged road Travel time is increased due to damaged road	Construction will be programmed to minimise the length of disruption at any one point These issues will be addressed once road constructed

136. As appropriate these concerns have been incorporated into the EMP items and have been related to the appropriate WSD officers. They should be taken up by the safeguard specialist when appointed.

Table 4: General Public interviewed during Public Consultation at Jahan Khan To Faizu Larro

Serial No.	Date	Location/ Venue	Contact Details	Name of Main Participants
1.	4-March, 2018	Ali Khanan	03469024548	✓ Ali Murad
2.	4-March, 2018	Ali Khanan	03338320858	✓ Muhammad Idrees
3.	4-March, 2018	Ali Khanan	03015756231	✓ Muhammad Mithal
4.	4-March, 2018	Ali Khanan	03136666337	✓ Javed Ahmad
5.	4-March, 2018	Ali Khanan	03229118556	✓ Waheed Murad
6.	4-March, 2018	Ali Khanana	03068325812	✓ Mushtaq Ahmad
7.	4-March, 2018	Ali Khanana		✓ Rab Nawaz
8.	4-March, 2018	WadyonManayo	03459655761	✓ Qaiser ✓ Allah Warayo ✓ Abdul Karim ✓ Liaqat Ali
9.	4-March, 2018	WadyonManayo	03459655761	
10.	4-March, 2018	WadyonManayo	03078460816	
11.	4-March, 2018	WadyonManayo	03136454531	
12.	4-March, 2018	Vehar Sharif		✓ Mubarak
13.	4-March, 2018	Vehar Sharif		✓ Sher Muhammad
14.	4-March, 2018	Vehar Sharif		✓ Haji Kamal Din
15.	4-March, 2018	Vehar Sharif		✓ Rehmat Ali

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VII. ENVIRONMENTAL MANAGEMENT PLAN

A. Objectives of Environmental Management Plan

137. The purpose of the environmental management plan (EMP) is to provide a summary of the predicted impacts associated mitigative measures and monitoring actions so as to minimize potential negative impacts and enhance positive impacts from the Project. The EMP will provide a guide (almost checklist) for the main stakeholders, namely the owner, contractor and operator of the road, on what mitigative actions need to be taken and where and when they are needed. It will thus help to improve the likelihood that adverse impacts are mitigated, project benefits are showcased, and an environmentally beneficial standards of best practice is provided to all those involved. In particular, the EMP:

- Defines roles and responsibilities for those involved in the implementation of the EMP and identifies areas where these roles and responsibilities can be shared with other stakeholders
- Provides concise instructions to project personnel and contractors regarding procedures for protecting the environment and minimizing environmental impact, making these legally binding through their inclusion in contract specifications
- Defines the requirements for communication, documentation, training, management and implementation of the mitigative measures; and,
- Specifies actions required to assess compliance with and effectiveness of the mitigation measures through a compliance and effects-monitoring mechanism, defined in the EMP's two action tables.

B. Environmental Management Plan for Jahan Khan To Faizu Larro

138. The EMP, mitigation and monitoring tables for the Sewan to Dadu road is included as Annex 1 to this report. It will be included in the contract documents in its entirety as an environmental clause, referenced as a mandatory exercise or integrated into the contract specifications as specific clauses. The estimated costs the BOQ items by the contractor.

139. The EMP will be revised if project design and construction parameters are changed significantly, then updated during the pre-construction stage of the project.

1. Preconstruction Phase

140. The pre-construction period is the time when road planners can influence the road design and work, thereby avoiding or reducing to an acceptable level any potential negative impacts. The value of the environmental assessment process can be undermined if this IEE and its EMP are not shared with or adopted by relevant parties during the design and bidding stages. A number of common issues and solutions are described in the EMP.

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141. In line with ADB SPS (2009), impacts and risks have been identified in the context of the project's corridor of impact. For rehabilitation projects, this impact corridor is the road RoW (20m-25m), any haul routes established for the work, and any temporary storage areas, usually located within the RoW. All construction materials will be purchased from fully licensed suppliers, who are assumed to be operating in an environmentally acceptable manner as defined by the national and provincial EPAs.

142. The EMP's mitigation (EmiT) and monitoring (EmoT) tables (Annex 1) identify eight important actions to be undertaken by the Sindh Works Department and the Construction Supervision Consultant, including a task to brief the selected maintenance staff of the WDS and any contractors on the EMP and the actions to be undertaken.

143. All environmental assessment documentation shall be prepared and approved during the preconstruction period, translated into the local language and distributed to all stakeholders, namely the local works department, the contractor(s), any monitoring agency and local government managers, for use in implementation of the environmental management actions.. By knowing where and what environmentally sensitive receptors exist, and what issues are likely to arise in the future, Sindh Works and Services Department will be able to avoid serious impacts by modifying designs, adjusting alignments or switching to more sustainable methods and/or materials.

144. A Site specific EMP (SSEMP) is to be prepared by the contractor, based on the generic EMP provided in the IEE. The SSEPM will perform a risk assessment of all mitigation options and will propose site specific mitigation options that would be appropriate and commensurate with the actual impact. The contractor will not be able to start the construction works before the approval of SSEPM from PMU and final approval from ADB.

145. Sindh WSD will provide a briefing to contractors on the contract and implementation requirements of the EMP.

2. Construction Phase

146. A major factor that can lead to the failure to implement an EMP is lack of qualified environmental experts with the contractors, and therefore (often total) lack of understanding of the EMP and good environmental management practice. An extensive training plan for the Contractor and PWD is being incorporated which need to be implemented. This should help to address this problem. Using the EMP, the contractor will prepare an Environmental Management Work Schedule (EMWS) placing all measures defined in the general EMP in a time bound schedule. It will identify mitigation and monitoring actions required in relation to particular construction activities. The contractor, with advice from the Environment and Social Unit (ESU) (a section within the PMU) will be mainly responsible for implementing the EMP.

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147. There are fourteen Construction phase EMP actions focusing mostly on contractor activities, the management of worksites and contractors' equipment and people. Specifically this part of the EMP focuses in defining ways to minimize effects such as dust generation, emission from vehicles and air quality, disposal of spoil and solid waste, noise and vibration from construction machinery, quarry and borrow material transport and disposal, contamination of surface and groundwater resources and work camp management.

3. Operating Phase

148. Operation period actions focus on confirming that the contractor completed the EMP tasks required and that the operation of the improved road does not aggravate existing problems such as roadside safety. All the work proposed is on existing roads and confined to the existing RoW. There will be some increase in the speed and volume of traffic, raising potential road safety issues (e.g. Q1 and 2). Speed limits will be monitored through traffic police as discussed earlier.

149. Most of the impacts are positive due to better road conditions which do not require any mitigation measures such as:

- Less travelling time
- Quicker access to Market
- Fuel efficiency
- Less dust generation
- Safer journeys

C. Cost Estimates

150. The cost of implementation of the environmental safeguards includes both the direct cost of the mitigation measures and the costs of monitoring the execution of the EMP such as laboratory costs and monitoring visits, training costs, etc. **Error! Reference source not found.** shows the cost to be included in the BOQ items by the contractor.

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Table 5: EMP Implementation and monitoring estimated cost for Contractor

S. No.	Item	Unit Cost	No. Of Unit	Frequency Per Anum	Total (Rs)
1	Construction Noise Monitoring	500	10	12	60,000
2	Drinking water quality monitoring (During construction)	30,000	1	02	60,000
3	Personal protective Equipment	8000	60	1	480,000
4	Fire Fighting Equipment's Purchase and refilling	10,000	8		800,000
5	Health and Hygiene				-
5.1	First Aid box complete	10,000	4		40,000
5.2	Water filter with extra filters	30,000	4		120,000
5.3	Air monitoring & Testing				-
5.3.1	Air emission testing including vehicles, gensets and Ambient Air on construction sites	75,000	1	04	300,000
6	HSE specialist and officer	100,000	1	12	1200,000
7	Contingency /Misc. / other (Afforestiation, Plantation of trees, Landscaping and others)	10 %			
	Total				**33,66,000**

D. INSTITUTIONAL CAPACITY NEEDS, PROPOSED STRENGTHENING AND IMPLEMENTATION ARRANGEMENTS

1. Technical Capacity Building

151. The Sindh provincial road improvement project will be coordinated by the Works and Services Department as an executing agency (EA) with a project management unit (PMU) established within WSD as Implementation Agency. The PMU will be self-sufficient to monitor the environment related issues.

152. A dedicated Environment and Social unit (ESU) will be established within the PMU. Unit will be headed by the PMU Project Director and will have one qualified environmental specialists who will look for both upper and lower Sindh region roads. The environmental specialist will monitor the environment related issues and monitor the Contractor and consultant progress and report the Project Director WSD and ADB.

2. Implementation Arrangements

153. The project is being administered by the Project Management Unit (PMU), Works and Services Department (WSD) Government of Sindh (GOS), which is headed by

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the Project Director, PMU has hired the Project Management Consultant (PMC), for design review and construction supervision of the civil works.

154. The PMC with assistance of environmental specialist:

- Prepare environmental screening checklists;
- Ensure that the EMPs, including all proposed mitigation measures and monitoring programs are properly implemented by the contractor.
- Ensure the health and safety of workers, and community guidelines are being followed by the contractor.
- Share information and disclosure of environmental safeguard documents (including any Corrective Action Plans prepared in cases of change to original project design) as required.
- Carry out visits to construction sites, work camps, quarries and borrow pits to review the environmental performance of the contractors;
- Ensure that the required environmental training is provided to the staff concerned;

155. Contractor will hire one full time persons to address the environmental safeguards; Environmental Engineer's responsibilities will include;

- Prepare Site specific EMP as per generic EMP of this road.
- Monitor the work and undertaken the monthly reporting.
- Carryout site visits of construction camp, construction site(s), quarries and borrow pits to review environmental status and rectify the non-compliances.
- Supervise the environmental monitoring is being carried out as pre-defined frequencies mentioned in EMP
- Coordinate with PMC Environment specialist to conduct site visits.
- Impart trainings as per schedule.
- Prepare monthly environmental monitoring report

156. Environment inspector responsibilities will include;

- Conduct day to day Site inspection activities for any non-compliance
- Conduct environmental monitoring activities through certified environmental laboratory.

157. ADB's responsibility will be to review IEEs as a basis for the approval of the subproject.

3. Monitoring and Reporting

158. Following section describes monitoring and reporting frequencies and responsibilities;

a) Implementing Agency

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- The IA's Environmental Safeguards Unit will prepare a compliance monitoring checklist, based on the EMP and brief Environment Engineer of the Contractor on its use and implementation schedule. The checklist will be completed monthly.
- Carry out field visits for HSE compliance monitoring on quarterly basis
- The Implementing agency will use the compliance checklist reports, plus a semi-annual audit of the work as the bulk of the content of the semi-annual construction monitoring report to ADB.

b) Project Management Consultants

- Ensure the compliance monitoring is being carried out monthly, quarterly and semi annually during the construction period.
- If non compliance in recorded, conduct review meetings with Contractor to address the non-compliance.

c) Contractor

- Contractor Environment Engineer will be required to submit monthly checklists to the Implementing Agency duly reviewed by PMC, defining what mitigative actions have been undertaken and where this work was done.
- Conduct the Environmental Monitoring (Air, Drinking water Canal Water, Noise (ambient noise and equipment noise) as per frequencies and parameters mentioned in the EMP (**Table 3**)

d) ADB

- Review the biannual monitoring report and follow up all outstanding issues.
- Approve any proposed changes to the management plans or procedures

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Table 6: Monitoring and reporting frequencies

S. No	Time frame	Location	Category / Equipment	Parameters to be Monitored	Reporting Frequency	Implementer Responsibility	Supervision
1.	**Environmental monitoring plan for Canal Water Monitoring**						
a.	Pre-Construction	At Dadu Canal Random 3 Water courses	Physical Parameters	pH, Color, Turbidity, TSS, TDS, Total Hardness. COD. BOD and oil and grease	Once	Design Consultant	PMU
b.	Construction	At Dadu Canal and Random 3 Water courses	Physical Parameters	pH, Color, Turbidity, TSS, TDS, Total Hardness. COD. BOD and oil and grease	Quarterly	Contractor Environment Engineer	Supervision Consultant
2.	**Environmental monitoring plan for Drinking Water**						
a.	During Construction	Campsite	Biological Parameters	E-Coli, fecal coli form, Total Coli form	Quarterly	Contractor Environment Engineer	Supervision Consultant
b.	During Construction	Campsite	Physical Parameters	pH, Color, Turbidity, TDs, Total Hardness	Quarterly	Contractor Environment Engineer	Supervision Consultant
c.	During Construction	Campsite	Chemical Parameters	Chloride, Fluoride, Nitrate, Nitrite, Pb, Zn.	Quarterly	Contractor Environment Engineer	Supervision Consultant
3.	**Environmental monitoring plan for Ambient Noise**						
a.	Pre-Construction	3 sensitive locations (School Hospital	Ambient Noise	dBA	Once	Design Consultant	PMU

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S. No	Time frame	Location	Category / Equipment	Parameters to be Monitored	Reporting Frequency	Implementer Responsibility	Supervision
		Residential Areas)					
b.	During Construction	3 sensitive locations (School Hospital Residential Areas)	Ambient Noise	dBA	Quarterly	Contractor Environment Engineer	Supervision Consultant
4.	**Environmental monitoring plan for Air Emission**						
a	During Construction	Campsite	Construction Machinery & Generators	CO/CO2, SO2, NOx, PM 10	Quarterly	Contractor Environment Engineer	Supervision Consultant
5.	**Environmental monitoring plan for Ambient Air**						
a	Pre-Construction	Random 3 towns along road and One at Campsite	Ambient air	SOx, NO, NOx, CO, PM10	Once	Design Consultant	PMU
b	Construction	Random Three towns along road and One at Campsite	Ambient air	SOx, NO, NOx, CO, PM10	Quarterly	Contractor Environment Engineer	Supervision Consultant

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VIII. CONCLUSIONS AND RECOMMENDATIONS

A. Principal Findings

159. This Supplementary IEE is one of the additional packages prepared for the Provincial Road Improvement Project of Government of Sindh Works and Services department. This IEE is in respect of the Sehwan to Dadu road section

160. The proposed rehabilitation/improvement of the Sehwan to Dadu road will have very little environmental impact. The work will be constrained within the current right of way and thus there will be no significant impact on adjoining lands, cultural sites or on fauna or flora. The environmental category of project is 'B' in accordance with ADB SPS 2009 and therefore IEE has been conducted.

161. The following are the main issues identified and concerns raised during the study:

- The project is in predominantly bad condition and travelling time is around double the time that would be expected for a road in good condition;
- The road embankment is eroded in some places;
- There are 12 houses, 1 animal fooder shed,1 mosque and 2 shops impinging in the width of the project road. The impact would be avoided to reduce the section width designed at 5.5 m main carriageway. The detail is given in Resettlement Due Diligence Report
- There are two major water bodies namely Guddu canal and MNV drain and number of small waterways crossing the road, requiring special care during construction works
- There is no protected forest in Sehwan to Dadu road RoW.
- There is No wetland or any ecological sensitive area found in RoW; these are at considerable distance and will not be affected due to the project activities.

B. Conclusion

162. The improvement of the Sehwan to Dadu road Section is the part of the Provincial Road Improvement Project of the Government of Sindh, is limited to road rehabilitation within the existing right of way. It is therefore likely to have only limited impact of a temporary nature and short duration. The impacts can be mitigated with the measures proposed in the Environmental Management Plan.

163. Provided the EMP is followed, there should be no damage to cultural and archaeological sites and other permanent structures. Trees located on the embankments will not be disturbed. The environmental safeguards will have to be monitored by concerned agencies, including Contractor, Environment Specialist ES (PMC) and PMU-W&S Department. Due diligence, with mandatory coordination among various stakeholders, will further ensure mitigation of any adverse impacts.

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164. This IEE study concludes that the proposed pilot road project will not lead to significant adverse environmental and social impacts of such nature or magnitude that would require a more detailed report in the form of an EIA. Additionally careful implementation of the EMP will ensure that environmental impacts are managed and minimized and the project proponent meets all statutory requirements.

165. The project has been discussed with local people, government officials and NGO. The consultations elicited general support for the project. There were no serious environmental issues raised or matters that the Consultant had overlooked. The main concerns expressed were to ensure that local people got employment on the project and that measures were in place to avoid excessive noise or dust. There was also a concern about safety, especially during construction, but generally a view that improved road conditions would improve safety.

C. Recommendations

166. A schedule of activities associated with reconstruction has been prepared and the potential environmental impacts of each activity assessed. For each activity, recommended mitigation and monitoring actions have been identified. These are covered in the Environmental Management Plan. All impacts are minor and able to be mitigated.

167. The following recommendations are carried over from the text:

- Environmental monitoring shall be carried out by the IA and contractor in compliance with the EMP to minimise damages to the environment, workers or the community. This will be enforced through contract specifications and an environmental BoQ section.
- The contractor will ensure that borrow material /earth-fill will be obtained from the approved sites.
- Trees located on the embankments will not be disturbed.
- Asphalt plant shall be located at least two kilometres from settlements and from canals
- Construction camps will be located a minimum of 1000m from existing settlements, built-up areas and at least 1000 m from canals.
- Excavation of earth fill will be limited to an appropriate depth of 20cm.
- Canals and other water resources will be closely monitored to ensure no contamination occurs due to project related activities
- A dust abatement program will be implemented that includes spraying water on roads and work areas within villages and past houses adjacent to the road.
- Health and safety plans will be prepared.
- Construction work shall not hinder local people's access to nearby facilities.

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- SSEMP will be developed by the contractor which needs to be reviewed by the PMC, approved by IA and final approval is required from ADB. Contractor will not able to start the construction till the SSEMP is not approved.
- An emergency and safety plan will be developed by the contractor/PMU for bridges and roads near canals and waterways.
- A grievance redress mechanism will be implemented by the contractor to ensure that community complains are addressed and recorded.

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ANNEXURES

ANNEXURE – 1:

TABLE 14 ENVIRONMENTAL MANAGEMENT PLAN:

ENVIRONMENTAL MITIGATION TABLE (EMIT) AND ENVIRONMENTAL MONITORING TABLE (EMOT)

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ANNEXURE - 1: TABLE 14 ENVIRONMENTAL MANAGEMENT PLAN: ENVIRONMENTAL MITIGATION TABLE (EMIT) AND ENVIRONMENTAL MONITORING TABLE (EMOT)

Environmental Issue	Mitigation Measure	Time frame	Location	Implementer	Supervisor
1. Pre-Construction Period Impacts					
1.1. Lack of environmental technical capacity within WSD and its PMU in environmental assessment and design, management, supervision and reporting.	PMU will establish a safeguard unit within PMU to manage environmental social and safety aspects of subprojects. The Safe Guard Unit (SU) would include qualified environmental specialist who will ensure that environmental safeguard measures associated with this and other projects are credibly implemented including provision of necessary trainings.	A PMU will be established prior to loan effective-ness, with training completed during detailed design. Contractor training, and environmental briefing will be conducted prior to mobilization.	Head office WSD	Design Consultant	PMU
1.2 Consideration of IEE/EMP in preparation of the detailed design and bid documents.	PMU will check that design and bid documents are responsive to key environmental, social and safety considerations, and that the proposed method of work reflects the boundaries defined in the EMP.	Before the tendering	NA	Design Consultant	PMU
1.3 Loss of Vegetation and trees	No mature trees to be cut except only bushes and shrubs.	Design and implementation planning for Sehwan to Dadu road	At any location	Design Consultant	PMU
1.4 Top Soil Erosion	Sindh WSD will prepare an earthworks checklist that defines for the contractor, limits to the excavation during the road rehabilitation. Instructions for topsoil	During Planning phase, in parallel with the preparation of bid	At any locations where borrow pits, quarries will be operated.	Design Consultant	PMU

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Environmental Issue	Mitigation Measure	Time frame	Location	Implementer	Supervisor
	management will also be defined, including the removal and storage of all topsoil to be used in landscaping, once the road work is completed. Use of soil from private land will be minimized and only after consultation with and compensation of landowners.	documents			
1.5 Disturbance to Permanent Structure	12 houses, 1 animal fooder shed,1 mosque and 2 shops will be avoided by reduce the section width designed at 5.5 m main carriageway.	During Implementation Phase	4+200 Houses (04) 9+700 (Mosque) 10+600 Houses (03) 16+440 Shops (02) 16+873 House 16+920 House 16+940 Animal Fodder Shed 16+980 House 16+990 House 17+ 000 House	Design Consultant	PMU
1.6 Materials Haul Routes	Construction vehicles hauling materials along urban roads and anywhere where there are roadside residence will be limited and the WSD will establish a route plan to minimize this disruption	Prior to contractor mobilization	NA	Design Consultant	PMU
1.7 Consultation Plan with affected roadside landowners	Rehabilitation work will result in access from a business and residence to the road being cut off or limited at times. To prepare for this inconvenience, WSD will define a road work information exchange procedure requiring the contractor to contact roadside landowners of the work, the period of access restriction and	Completed prior to contractor mobilization and provided the contractor as part of the contract documentation	NA	Design Consultant	PMU

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Environmental Issue	Mitigation Measure	Time frame	Location	Implementer	Supervisor
	the measures taken to allow movement around the construction work.				
1.8. Contractor's Environmental Safeguards Capacity	Unfortunately contractors have a very poor record with complying with workplace and environmental safety regulations. To address this WSD will require the contractor to define a Occupational and Environmental Health and Safety procedure for all work, including work camp operation, management of cement dust, and use of Personal Safety Equipment	Plan to be provided the Consulting Engineer and PMU prior to start of work	WSD	Design Consultant	PMU
2. Construction Period Impacts					
2.1 Dust Generation Transportation of Material					
A small increase in particulate matter (dust) is expected within the ambient air of the construction area and from vehicles hauling construction materials to the work sites.	i. The Contractor will be required spray water on unsealed roads and work areas within villages and past houses located close to the road and giving priority to sealing in urban areas. ii. Dust control at the construction site will be controlled by watering, setting strict speed limits of no more than 30kph in or near settled areas.	Throughout the construction period	Anywhere where there is material moved, earthworks cutting and filling.	Contractor	PMC (Supervision Consultant)
2.2 Dust Generation: Quarry and Batchling Plant Operation	i. Dust from the cement work will be avoided by using bulk cement brought to the plants in large tanker trucks and transferred to the plant hoppers via a closed system. ii. Batch plants will need to be equipped with dust suppression equipment, now	Throughout the construction period	Anywhere where there is material moved, earthworks cutting and filling.	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigation Measure	Time frame	Location	Implementer	Supervisor
	standard on most such facilities, or which can be easily retrofitted				
2.3 Top Soil Erosion	i. Excavation of earth fill will be limited to an appropriate depth of 20cm. ii. Where use of agricultural land is unavoidable, the top 15cm of topsoil will be stripped and stored and then replaced after removal of borrow material. iii. Where deep ditching is carried out, the top half metre layer will be stripped and stockpiled. iv. The ditch will be filled initially with debris/scrap material from old construction and levelled with stockpiled topsoil later. v. Where ditches and borrow pits cannot be fully rehabilitated, land owners will be compensated as provided in agreements between the land owner and contractor	During Construction	At any locations where borrow pits, quarries will be operated.	Contractor	PMC (Supervision Consultant)
2.4. Increase in air pollution from vehicular and machinery exhaust	Emissions will be minimised by: i. ensuring that the contractor's fleet of vehicles are properly maintained according to manufacturer's specifications; ii. use of appropriate octane fuel and haul loads within specified limits. iii. Vehicle idling time limits to no more than 2 minutes, iv. Equipment such as the diesel generator will be included in the	During Construction	Construction Site	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigation Measure	Time frame	Location	Implementer	Supervisor
	emission control program and will be and regularly tuned to prevent excessive TPM pollution.				
2.5 Disposal of Spoil and Solid Waste					
i. asphalt layers and base materials of the existing road	i. It may be re-used in the soft shoulders or as fill for other parts of the new road depending on the quality of the material. It may also be used as back-fill for borrow pits and then over-lain with top soil. Asphalt can be pulverized, spread on access roads and compacted.	During Construction	All Construction Sites	Contractor	PMC (Supervision Consultant)
ii. Unused construction material (sand, crush), empty drums, concrete waste and waste from work camps.	i. The contractor will identify dumping locations for construction debris and non-hazardous solid waste with respective TMA of Dadu ii. The contractor shall identify any hazardous waste as part of its health and safety plan and dispose of the material through Sindh EPA approved waste contractor s under section 13 of the Sindh Environment Protection Act 2014. iii. The cost of disposal of hazardous and non-hazardous waste shall be included in the Contractors BOQ.	During Construction	All Construction Sites	Contractor	PMC (Supervision Consultant)
2.6 Noise & Vibration					
i. Noise and Vibrations associated with earthworks and haul roads.	i. Enforcing a speed limit of 30 kph within 500m of any village and the use of water sprinkling for dust settling at least on road for 500m on	During Construction period	Construction areas	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigation Measure	Time frame	Location	Implementer	Supervisor
	either side of a village. ii. Restricting operating hours through roadside villages and settlements to between hours of 0700 and 1800. iii. Large and noisy machinery operations close to urban areas are restricted to daylight hours, and a schedule agreed to between contractor and local communities.				
ii. Excessive Noise at sensitive sites	At the same locations and times that surface water quality is tested, noise measurements will be completed, but with measurements taken at sensitive receptors As defined in the IEE	Throughout construction period, at least every month, using a portable sound pressure meter.	As listed in IEE: Schools, residential areas, Mosques and health care facilities along the road side, and as identified in the IEE.	Contractor	PMC (Supervision Consultant)
2.7 Quarry/Borrow Materials					
i. Overloading of trucks, may damage pavement, bridges, and culverts	i. The Contractor will ensure that loaded trucks do not exceed road, bridge and pavement specifications and are checked by weighbridges. The contractor will be required to monitor the transport of material, recording vehicle movements and weights, to be inspected.	Throughout construction period	Construction sites	Contractor	PMC (Supervision Consultant)
ii. Risk of erosion and destruction of landscape / agriculture land from side borrow operations.	ii. Any need for borrow material outside of the RoW will be subject to local environmental approvals and procedures and should also be carried out in consultation with ES of IA/PMU.	Construction Period	Along any stretches where road will be raised and fill is needed, particularly in areas with long visual distances	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigation Measure	Time frame	Location	Implementer	Supervisor
iii. Contractor extracts material from borrow areas without the permission of the Landowner.	iii. It will be ensured by PMU that borrow material will be purchased/ or taken only after the consent of the land owner has been obtained.	Construction Period			
2.8 Contamination of Water Resources (Surface& Ground)					
i. Surface water can be polluted by entering cement and other chemicals used in rehabilitation works.	i. All fuel storage sites must `be checked daily for leaks and held in an impervious site where spilled/leaking material can be collected. ii. Fuel and oil storage areas should be at least 500m away from watercourses and repair and fuelling yards to be equipped with an impervious platform, with interceptor traps so that any fuel leakage is retained within the site. iii. Wash down water from machinery repair areas to be directed into this system that retains the oil and grease. Refuelling to be carried out at the fuel storage area and not be permitted within or adjacent to watercourses. Surface water channels crossed by the road will be monitored upstream and downstream of the road before, during and after the work has been completed on that crossing. iv. Water channels have to be diverted	Throughout the construction period	Based on an analysis of soil conditions by contractor /and consultant hydrology and geotechnical expertise	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigation Measure	Time frame	Location	Implementer	Supervisor
	v. properly, protection arrangements should be provided at each culvert / water crossing				
2.9 Damage / disturbance to Utilities within RoW	i. A relocation plan of the utilities will be developed during the preparation of the LARP or Resettlement Due Diligence Report. The Contractor will need to be aware of the location of these services so that disruptions are not caused. ii. Placing the responsibility for any repair of the services with the Contractor will assist in avoiding damage to these services.	Before the start of construction work. Design phase.	Where utilities services located	Contractor	PMC (Supervision Consultant)
2.10 Traffic Disturbance					
Loss of access for roadside residents	Contractor shall provide safe and convenient passage for vehicles and pedestrians to and from side roads and properties connecting the project road/area, Work that affects the use of side roads and existing access shall not be undertaken without provision of adequate alternate routes; to the prior satisfaction of the Engineer and affected persons. Contractor shall submit the Traffic plan which needs to be approved from The Engineer.	Construction Period	Town Crossings Canal Crossings	Contractor	PMC (Supervision Consultant)
2.11 Health and Safety Concerns					
i. Protecting the workforce and maintaining a safe working environment.	i. Contractor must provide safety vests, hard hats and protective footwear for all workers handling heavy machinery,	Construction period	Construction Camps, Construction sites and Asphalt Plant	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigation Measure	Time frame	Location	Implementer	Supervisor
ii. Transmission of communicable diseases (such as STI's and HIV/AIDS) to the local community.	and working with hazardous materials such as concrete, asphalt, paints, cleaning agents, herbicides and pesticides. ii. Contractor must provide protective masks to milling machine operators, and anyone working in the area of the milling machine dust- cement hopper area, with masks of a micron size, capable of capturing dust down to 2 microns. iii. Contractor to provide high- visibility clothing for workers at sites that have active traffic. Any works at night should be adequately lit and high visibility clothing worn and contractor should provide basic training on use of protective clothing and equipment. iv. All Construction labour and staff of the contractor and consultant will be tested for the communicable disease (STD &STI).		area		
2.12 Interruption /Contamination of Water channels					
	i. Contractor should provide the adequate sized diversion, so that there shall be no disturbance to water flows of canal /water course. ii. Protection mechanisim should be provided to avoid contamination. iii. Contractor should prepare traffic management plan, duly approved by	Construction period	Culverts and bridges	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigation Measure	Time frame	Location	Implementer	Supervisor
	the Engineer. Contractor shall also provide appropriate diversions, with signages and lighting arrangements, to avoid any accidents. iv. The land used for the temporary diversion and the water course shall be restored as far as possible to its initial state once the work has been completed				
2.13 Over Used Local Resources					
Project Labor force can impose a burden on, water resource, wildlife, fuel wood, and sanitation system.	Local labour will be hired for the project so there will be no additional impact on natural and social resources and services.	Construction period	Construction Camps, Work site and Asphalt Plant area	Contractor	PMC (Supervision Consultant)
2.14 Contractor Good Housekeeping Practices not Applied					
	i. All camps shall be provided with septic sanitation facilities and potable water. ii. A solid waste collection program must be established iii. Monitoring will be required for the solid waste disposal at camp site and to ensure that the health and safety plan based on contract specifications is followed. iv. Once the site is no longer needed the contractor must fully decommission it, with special emphasis on waste removal and clean up of any spills or hazardous materials plus any	Throughout the construction period	All construction camps , work areas and contractor 'yards'	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigation Measure	Time frame	Location	Implementer	Supervisor
	necessary re- vegetation.				
3. Operating Period					
3.1 Missing environmental safeguards completion report	The contractor, will provide an mitigation and monitoring completion report listing all actions taken in compliance with this EMP items defined and with any other safeguard requirement specified in the contract and submit that to the PMU before the final payment can be released	1 month before the end of the construction period	NA	WSD & Contractor	WSD
3.2 Air Quality degraded and Noise Level Increase	Maintenance Dept. will endeavour to keep road dust free and speed limit signs will be maintained. Police will improve enforcement of limits and conduct spot checks if muffler systems on trucks. Also signed re no-horn use will be erected in urban areas.	Operation period	All nearby Towns	Traffic Police	-
3.3 Increased Risk of Accident and Injury	Appropriate traffic calming and signage will be installed for the driver, speed limits shall be monitored by the traffic police to avoid any accident and subsequent spillage. An emergency service may be provided by the local authorities.	Operation period	As per design	Contractor and Traffic police	ES/PMU /IA

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A. Compliance Monitoring

The Contractor and the Supervising Consultant shall be responsible for the implementation of the Environmental Monitoring measures specified in the Environmental Monitoring Table (EMoT). During the construction period monthly safeguard monitoring checklists and observations on air, noise and water quality will be presented in a tabular monitoring reports and submitted to the Implementation Agency ES- PMC,. Monitoring reports and notes to file shall be prepared as per the frequency mentioned in the EMoT and shall be assembled by the PMU and its construction supervision consultant into semi-annual monitoring reports, as mandatory submissions to ADB. Noise measurements will be obtained via a portable noise meter to be used by the contractor and/or the PMC Environmental Specialist

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Table 7:

Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
1. Pre-Construction Period Impacts						
1.1. Lack of environmental technical capacity within WSD and its PMU in environmental assessment and design, management, supervision and reporting.	PMU will establish a safeguard unit within PMU to manage environmental social and safety aspects of subprojects. The Safe Guard Unit (SU) would include qualified environmental specialist who will ensure that environmental safeguard measures associated with this and other projects are credibly implemented including provision of necessary trainings.	Confirm that PMU and Contractor training is carried out during the relevant timescales.	At least 1 month before construction begins Within the 1st month construction begins.	Environment person working within PMU	Design Consultant	PMU
1.2. Lack of integration of IEE/EMP requirements into construction bid documents.	PMU will check that design and bid documents are responsive to key environmental, social and safety considerations, and that the proposed method of work reflects the environmental boundaries defined in the EMP.	Confirm that bid documents, contracts and have specific environmental items or there is a specific reference to the EMP	Before the tendering and before contract finalized	Date and time that confirmation completed filed with PMU	Design Consultant	PMU
1.3. Loss of Vegetation and trees	During detailed design the supervising	Monitor to obtain copy of plan and	Prior to start of construction	Date and time that	Design Consultant	PMU

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	engineer/consultant will modify the design on order to minimize the removal of mature trees from roadsides; carriage	record compliance—for presentation in smi-annual audit report		confirmation completed recorded & filed with PMU		
1.4. Top Soil Erosion	Sindh Works will prepare an earthworks checklist that will define, for the contractor, limits to the excavation during the road rehabilitation. Instructions for topsoil management will also be defined, including the removal and storage of all topsoil to be used in landscaping, once the road work is done Encroachment on private land will be minimized and only after consultation with landowners and and compensation of losses Land owners will be compensated This will be monitored through ES-PMU	Monitor checks that topsoil management steps prepared and ready for implementation	During Planning phase, in parallel with the preparation of bid documents	Copy of topsoil protection actions	Design Consultant	PMU
1.5 Disturbance to Permanent Structure	12 houses, 1 animal fooder shed,1 mosque and 2 shops will be	Monitoring to check the compliance	Planning phase	Written and dated note indicating	Design Consultant	PMU

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	avoided by reduce the section width designed at 5.5 m main carriageway.			compliance		
1.6. Materials Haul Routes	Construction vehicles hauling materials along urban roads and anywhere where there are roadside residence will be limited and the WSD will establish a route plan to minimize this disruption.	Route plan confirmed by PMU-planners and recorded for use in audit report	Prior to contractor mobilization	Written and dated note indicating compliance & inspection	Design Consultant	PMU
1.7. Consultation Plan with affected roadside landowners	The work along this road will affect the access from a business and residence to the road . WSD will define a road work information exchange procedure requiring the contractor to inform roadside landowners of the work, the period of access restriction and the measures taken to allow movement around the construction work, as well as actions to be taken to re-establish the preconstruction access	Review of plan and confirm a) consultation action proposed b) inclusion of timetable and c) inclusion of clean up and reconnection action.	Completed prior to contractor mobilization and provided the contractor as part of the contract documentation	Written and dated note indicating compliance	Design Consultant	PMU
1.8.Contractor's Environmental Safeguards	Contractors frequently do not comply with workplace and	Review Construction contracts and	Plan to be provided the Consulting	Written and dated note indicating	Design Consultant	PMU

Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
Capacity	environmental safety regulations. To address this WSD will require the contractor to define an Occupational and Environmental Health and Safety procedure for all work, including work camp operation, management of cement dust, mandatory use of Personal Safety Equipment	specifications- to check content for OHS plan content.	Engineer and PMU prior to start of work	compliance		
2. Construction Period Impacts						
2.1 Dust Generation : Transport of Materials						
i. A small increase in TPM (dust) is expected within the ambient air of the construction area and from vehicles hauling construction materials to the work sites.	i. The Contractor will be required spray water on unsealed roads and work areas daily, within villages and past houses located close to the road and giving priority to sealing in urban areas. ii. ii. Dust control at the construction site will be controlled by watering, setting strict speed limits of no more than 30kph in or near settled areas.	Travel work areas and check for dust—and if found take immediate action with contractor	Anywhere where there is material moved, earthworks cutting and filling.	Written and dated note indicating compliance or issue and action taken	Contractor	PMC (Supervision Consultant)

Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
2.2 Dust Generation: Quarry and Batchling Plant Operation	i. Dust from the cement work will be avoided by using bulk cement brought to the plants in large tanker trucks and transferred to the plant hoppers via a closed system. ii. Batch plants will need to be equipped with dust suppression equipment, now standard on most such facilities, or which can be easily retrofitted	Travel Quarry and Batchling Plant Operation site and check for dust—and if found take immediate action with contractor. Inspect batching plant dust suppression mechanism, its maintenance log book.	Anywhere where Quarry and Batchling Plant is being operated.	Written and dated note indicating compliance or issue and action taken	Contractor	PMC (Supervision Consultant)
2.3 Top Soil Erosion	i. Excavation of earth fill will be limited to an appropriate depth of 20cm. ii. Where use of agricultural land is unavoidable, the top 15cm of topsoil will be stripped and stored and then replaced after removal of borrow material. iii. Where deep ditching is carried out, the top half metre layer will be stripped and stockpiled.	i. Check query sites for depth. ii. Ensure contractor store topsoil properly, and restore query site as much as possible at end of work. iii. Ensure Land owner get adequate compensation	At any locations where borrow pits, quarries will be operated.	. Written and dated note indicating compliance or issue and action taken	Contractor	PMC (Supervision Consultant)

PMU S Project Director RIP W&S Deptt: Hyderabad.

Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	iv. The ditch will be filled initially with debris/scrap material from old construction and levelled with stockpiled topsoil later. v. Where ditches and borrow pits cannot be fully rehabilitated, land owners will be compensated as provided in agreements between the land owner and contractor					
2.4 Increase in air pollution from vehicular and machinery exhaust	Emissions will be kept to a minimum by: i. ensuring that the contractor's fleet of vehicles are properly maintained according to manufacturer's specifications; ii. use appropriate octane fuel and haul loads within specified limits. iii. Vehicle idling time limits to no more than 2 minutes and iv. Equipment maintenance specifications will be	Record findings and conduct regular inspections in association with construction supervision	Throughout the construction period	Inspection note to file for use in contractor reporting and in semi-annual audit report	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	imposed through construction inspection and regular reporting. v. Equipment such as the diesel generator will be included in the emission control program and will be and regularly tuned to prevent excessive TPM pollution.					
2.5 Disposal of Spoil and Solid Waste						
i. Asphalt layers and base materials of the existing road	i. It may be re-used in the soft shoulders or as fill for other parts of the new road depending on the quality of the material. It may also be used as back-fill for borrow pits and then over-lain with top soil. Asphalt can be pulverized, spread on access roads and compacted.	Monitor to check waste handling and disposal procedure of contractor	Throughout construction period	Note to file, signed and dated	Contractor	PMC (Supervision Consultant)
ii. Disposal of waste sand, aggregate, empty drums, concrete waste and waste from work camps.	i. The contractor will identify dumping locations for construction debris and nonhazardous solid waste with respective TMA's of Dadu and	Monitor to check waste handling and disposal procedure of contractor	Throughout construction period	Note to file, signed and dated	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	EPA Sindh ii. The contractor shall identify any hazardous waste as part of its health and safety plan and dispose of the material through Sindh EPA approved waste contractor s under section 13 of the Sindh Environment Protection Act 2014. iii. The cost of disposal of hazardous waste and non-hazardous waste shall be included in the Contractors BOQ item.					
2.6 Noise & Vibration						
i. Noise and Vibrations associated with earthworks and haul roads.	i. Enforcing a speed limit of 30 kph within 500m of any village and the use of water sprinkling for dust settling at least on road for 500m on either side of a village, Same approach is to be taken if the other site is used. ii. Restricting operating hours through road side villages and	Using a portable noise meter, monitor checks conditions , and inspects if work conducted within permitted time period on urban zones	Throughout construction period	Inspection note, signed and dated	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	settlements to between hours of 0700 and 1800. iii. Large and noisy machinery operations close to urban areas are restricted to daylight hours, and a schedule agreed to between the contractor and the local communities.					
ii. Excessive Noise at sensitive sites, identified in IEE, i.e. schools, residential areas, mosques, health care centers	i. At the same locations and times that surface water quality is tested, noise measurements will be completed, but with measurements taken at sensitive receptors As defined in the IEE	Noise measurements at these sites recorded bv monitor and if excessing, immediate action to erect temporary barriers	Throughout the construction period	Inspection note with noise reading results	Contractor	PMC (Supervision Consultant)
2.7 Quarry/Borrow Materials						
i. Overloading of trucks, damaging pavement, bridges, culverts etc	i. The Contractor will need to ensure that loaded trucks do not exceed road, bridge and pavement specifications and are checked by weighbridges. The contractor will be required to monitor the transport of material,	Examine weighbridge records and compare to amount of material moved	Throughout construction period	Inspection note re findings, dated and signed	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	recording vehicle movements and weights, to be inspected.					
ii. Risk of erosion and destruction of landscape / agriculture land from side borrow operations.	ii. Side borrow action is discouraged. However, any need for such work will be subject to local environmental approvals and procedures and should also be carried out in consultation with ES of IA/PMU.	Inspect all side borrow activities and establish what permission given, and if none require immediate closure and restoration of the site.	Throughout construction period	Inspection note re findings, dated and signed	Contractor	PMC (Supervision Consultant)
iii. contractor extracts material from borrow areas without the permission of the Landowner.	iii. It will be ensured by PMU that borrow material will be purchased/ or taken only after the consent of the land owner has been obtained.	Inspect all borrow areas outside RoW and establish permit/ agreement to take materials	Throughout construction period.	Inspection note re findings, dated and signed		
2.8 Contamination of Water Resources (Surface& Ground)						
i. Surface water can be polluted by entering cement and other chemicals used in rehabilitation works	i. All fuel storage sites must `be checked daily for leaks and held in an impervious site where spilled/leaking material can be collected. ii. Fuel and oil storage areas should be at least	Regular inspection of work camps, contractors yard, fueling areas , fuel storage Regular monitoring of diversion for	At least monthly throughout the construction period. At least fortnightly where diversions are placed	Checklist showing check fuel and lubricant handling, waste oil management , machinery was down	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	500m away from watercourses and repair and fuelling yards to be equipped with an impervious platform, with interceptor traps so that any fuel leakage is retained within the site. iii. Wash down water from machinery repair areas to be directed into this system that retains the oil and grease. Refuelling to be carried out at the fuel storage area and not be permitted within or adjacent to watercourses. Surface water channels crossed by the road will be monitored upstream and downstream of the crossing once before, during and after the work has been completed on that crossing. iv. Temporary structures in form of wood planks will be established on	signages and lightings		water control, etc. signed and dated--filed. Checklist showing the check for lighting and signages signed and date filled		

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	water ponds and canals in order to contain the construction material v. All diversions must be checked for Signages and lightings on weekly basis,					
2.9 Damage / disturbance to Utilities within RoW	i. A relocation plan of the utilities will be developed during the preparation of the LARP. The Contractor will need to be aware of the location of these services so that disruptions are not caused. ii. Placing the responsibility for any repair of the services with the Contractor will assist in avoiding damage to these services.	Review of notifications and approvals from all utilities as per the legal requirements	Before the start of construction work. Design phase.	Inspection note re findings, dated and signed	Contractor	PMC (Supervision Consultant)
2.10 Traffic Disturbance						
i. Loss of access for roadside residents	Contractor shall provide safe and convenient passage for vehicles and pedestrians to and from side roads and properties	Inspect construction areas where access is an issue and	Throughout construction period	Inspection note re findings, dated and signed	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	connecting the project road/area, Work that affects the use of side roads and existing access shall not be undertaken without provision of adequate alternate routes; to the prior satisfaction of the Engineer and affected persons. Contractor shall submit the Traffic plan which needs to be approved from The Engineer.	establish if contractor is managing problem and if local residents are satisfied				
2.11 Health and Safety Concerns						
i. Protecting the workforce and maintaining a safe working environment.	i. Contractor must provide safety vests, hard hats and protective footwear, dust masks (good for 2.5 micron size particles) and ear plugs for all workers handling heavy machinery, and working with hazardous materials such as concrete, asphalt, paints, cleaning agents, herbicides and pesticides. ii. ii.Contractor to provide	Inspection of construction sites to ensure proper use of OHS gear and contractor enforcement	Throughout construction period	Inspection note re findings, dated and signed	Contractor	PMC (Supervision Consultant)

PMU S Project Director R/P W&S Deptt: Hyderabad.

Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
ii. Transmission of communicable diseases (such as STI's and HIV/AIDS) to the local community.	high- visibility clothing for workers at sites that have active traffic. Any works at night should be adequately lit and high visibility clothing worn. Contractor to provide basic training on use of protective clothing and equipment. iii. All Construction labour and staff of the contractor and consultant will briefed in STD's and given option to be tested (personal choice).					
2.12 Intruption /Contamination of Water Sources						

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	i. Contractor should provide the adequate sized diversion, so that there shall be no disturbance to water flows of canal /water course. ii. Protection mechanisim should be provided to avoid contamination. iii. Contractor should prepare traffic management plan, duly approved by the Engineer. Contractor shall also provide appropriate diversions, with signages and lighting arrangements, to avoid any accidents. iv. The land used for the temporary diversion and the water course shall be restored as far as possible to its initial state once the work has been completed	Inspection of diversion along the road, check signages, lighting any leakage etc at the diversion and rectify through contractor. Ensure contractor has adequately restored temporary land.	Culverts and bridges	Contractor EHS Officer	Contractor	PMC (Supervision Consultant)
2.13 Over Used Local Resources						
i. Project Labor force can impose a burden on, water resource, wildlife, fuel	i. Local labour will be hired for the project so there will be no additional	Inspection of work areas and meet with local officials	Throughout construction period—at least	Meeting note signed and dated	Contractor	PMC (Supervision Consultant)

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
wood, and sanitation system.	impact on natural and social resources and services.	to establish if excessive use of local resources is a concern	once when work is near or in a community			
2.14 Contractor Good Housekeeping Practices not Applied	i. All camps shall be provided with septic sanitation facilities and potable water. ii. A solid waste collection program must be established iii. Monitoring will be required for the solid waste disposal at camp site and to ensure that the health and safety plan based on contract specifications is followed. iv. Once the site is no longer needed the contractor must fully decommission it, with special emphasis on waste removal and clean up of any spills or hazardous materials plus any necessary re-vegetation.	Inspect all camp operations including worker housing and all waste management procedures	Throughout the construction period while work camps are in operation	Inspection note re findings, dated and signed	Contractor	PMC (Supervision Consultant)
3. Operating Period						

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
3.1 Missing environmental safeguards completion report	The contractor, will provide an mitigation and monitoring completion report listing all actions taken in compliance with this EMP items defined and with any other safeguard requirement specified in the contract document and submit that to the PMU before the final payment can be released	Obtain completion report and review for compliance	1 month before the end of the construction period	Note to file and copy of completion report	WSD	WSD
3.2 Air Quality degraded and Noise Level Increase	Maintenance Dept. will endeavour to keep road dust free and speed limit signs will be maintained. Police will improve enforcement of limits and conduct spot checks if muffler systems on trucks. Also signed re no-horn use will be erected in urban areas.	WSD to take necessary action	During the operation of the upgraded road—on a continuing basis	Note to file indicating status of this maintenance work	WSD	WSD
3.3 Increased Risk of Accident and Injury	Traffic speed limit and noise restriction signage will be installed along the road and monitored by the traffic police An emergency service may be provided by the local authorities.	WSD to take necessary action	During the operation of the upgraded road—on a continuing basis	Note to file indicating status of this maintenance work	Traffic Police and WSD	WSD

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Environmental Issue	Mitigative Measure	Monitoring Action	Timing	Monitoring Delivered By	Implemented by	Supervised by
	Traffic calming in urban areas including speed-bumps.					

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ANNEXURE – 2: PICTURES

ANNEXURE - 2: PICTURES

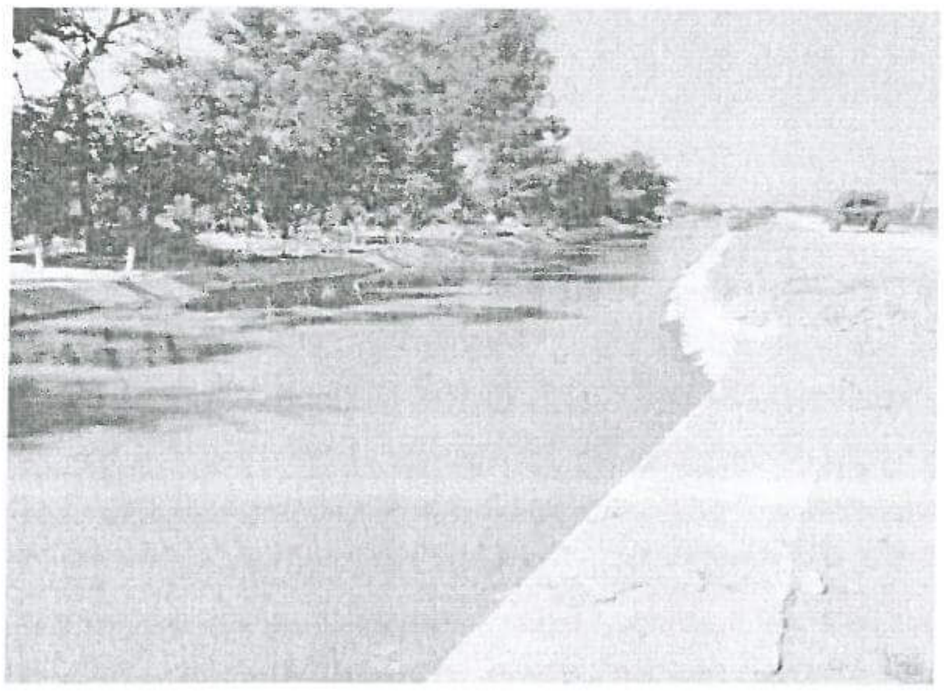

Fig: A view of Dadu Canal

Fig: Public Consultation

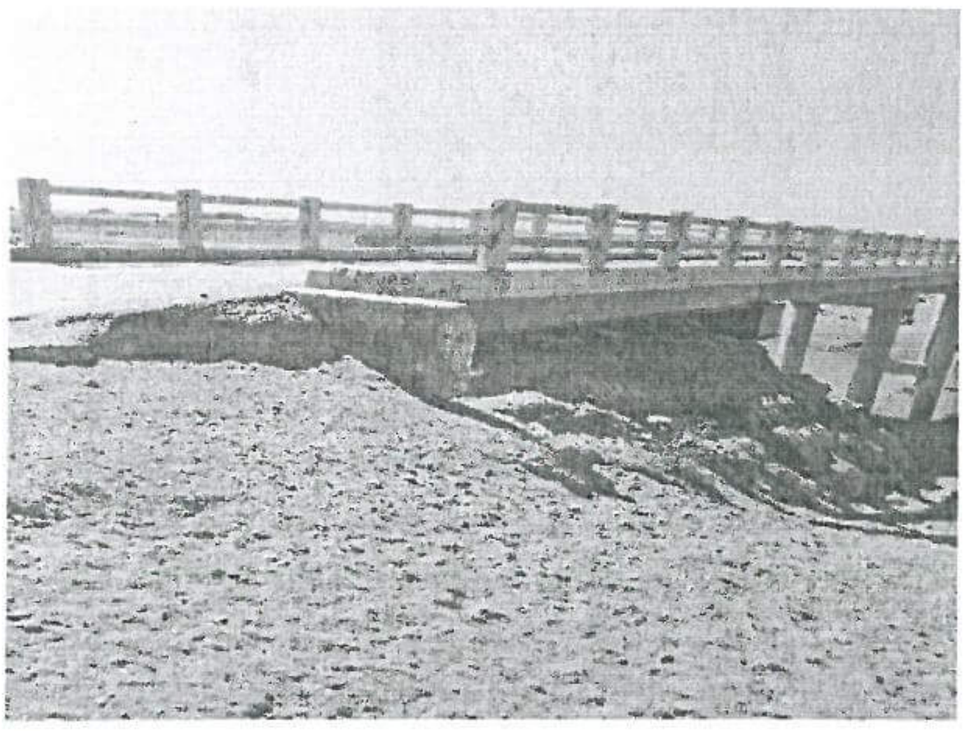

Fig: Right bank MNV drain bridge

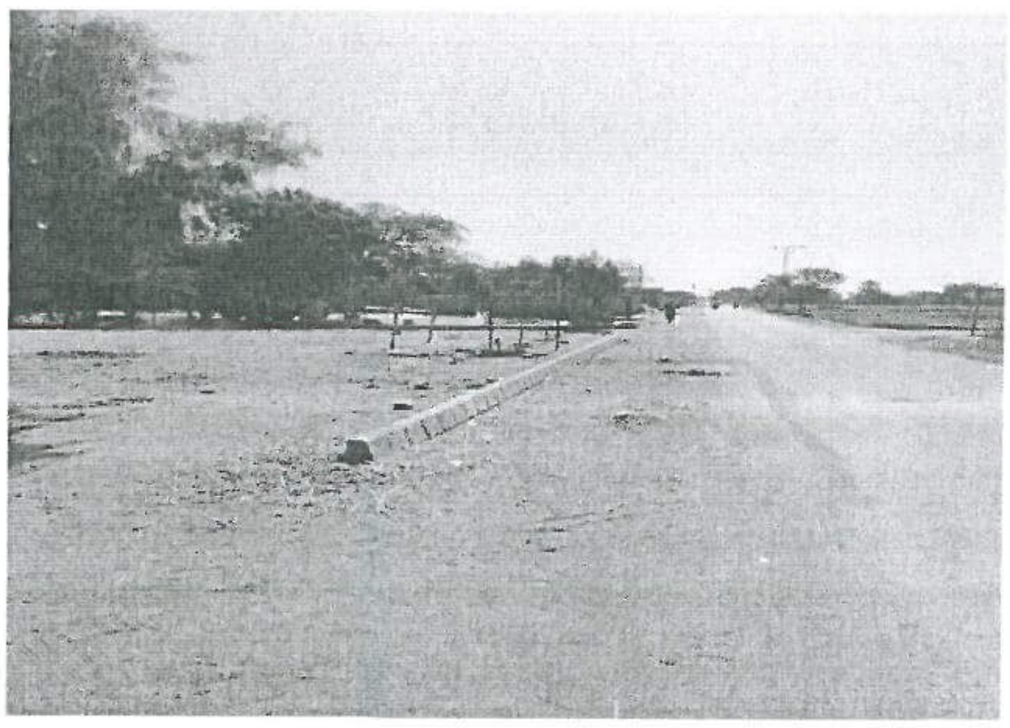

Fig: Road Condition

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Clients:

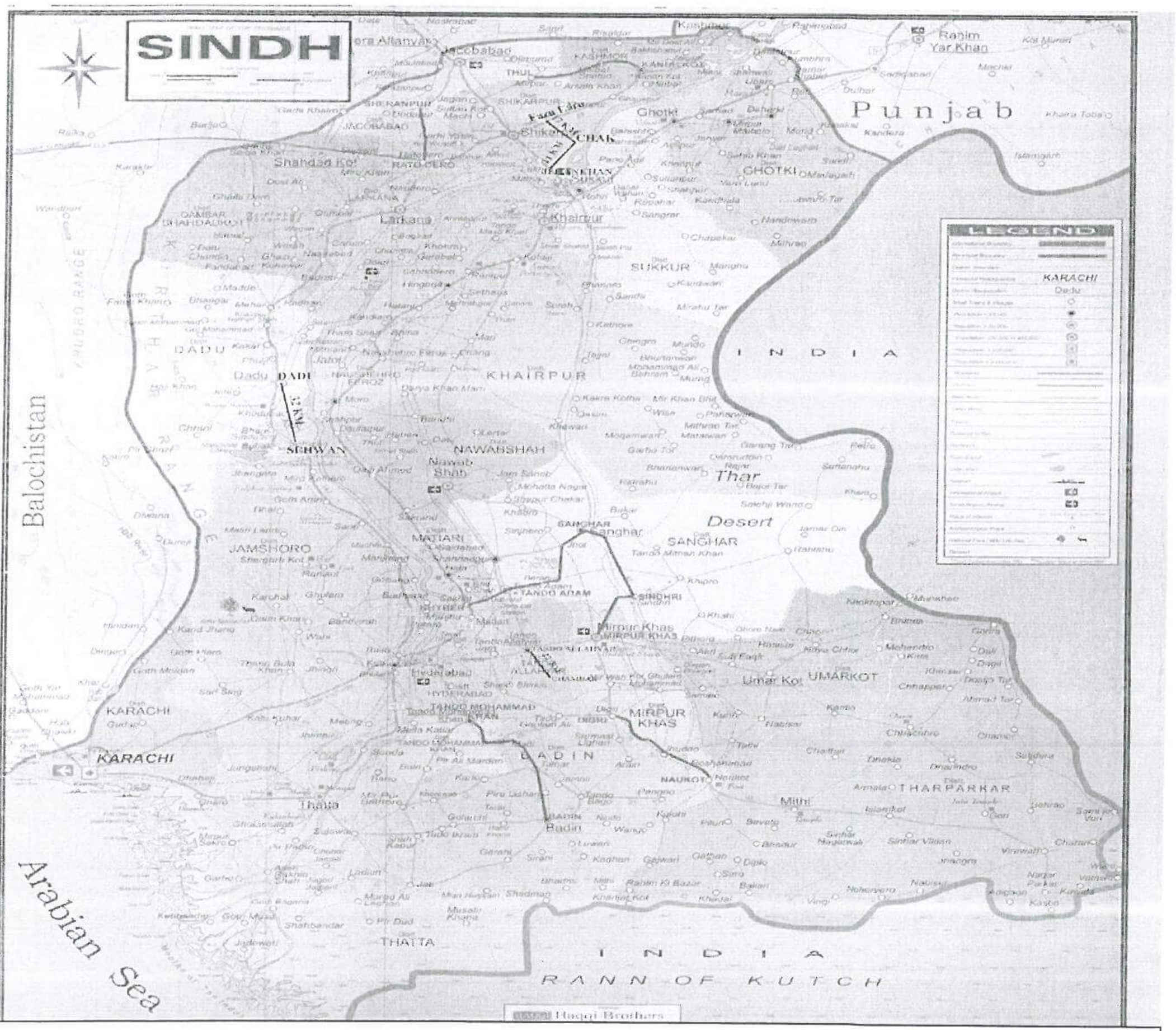
ADB Asian Development Bank

Works & Services Department Government of Sindh

SEHWAN- DADU ROAD DUE DILIGENCE REPORT

SINDH PROVINCIAL ROAD IMPROVEMENT PROJECT (SPRIP)

Loan No. 3305 – PAK/Contract No. SPRIP – CS1



This consultant's report does not necessarily reflect the view of ADB or the Government concerned and ADB and the Government cannot be held liable for its contents.

Yooshin ENGINEERING CORPORATION *in association with* UMAR MUNSHI ASSOCIATES CONSULTING ENGINEERS, ARCHITECTS & PLANNERS

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SEHWAN-DADU ROAD

DUE DILIGENCE REPORT

MARCH 2018

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TABLE OF CONTENT

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LIST OF ABBREVIATION

➢	ADB	Asian Development Bank
➢	SPRIP	Sindh Provincial Road Improvement Project
➢	FGD	Focus Group Discussions
➢	WSD	Works and Services Department
➢	GoS	Government of Sindh
➢	IR	Involuntary Resettlement
➢	IP	Indigenous People
➢	MPR	Monthly Progress Report
➢	NGO	Non-Governmental Organization
➢	PIU	Project Implementation Unit
➢	RoW	Right of Way
➢	RD	Reduced Distance
➢	SPS	Safeguard Policy Statement
➢	ToR	Terms of Reference
➢	UTM	Universal Transverse Mercator

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1. Introduction

1. 1 Background

1. The Government of Sindh (GoS), with assistance from the Asian Development Bank (ADB) plans to rehabilitate the existing provincial highway network in Sindh to develop an affordable, safe, and sustainable transport system. The Government has its highest priorities which aim to improve the quality of transportation by upgrading the highways network. This will increase the economic well-being of local population and alleviate the poverty.

2. As per scope of work for this project road rehabilitation work will be limited to the existing Right of way (ROW), which is 110 feet wide. Works and Services Department (WSD), Government of Sindh owns the ROW and no land acquisition are needed for the project. The construction limit between toes of embankment on either side comprises maximum of 7.3 m (24 ft) carriageway with 2.0 m (8.20 ft.) shoulders on either side total 11.3 m (37 ft.) to avoid the resettlement impact.

3. On-going consultations through meetings, interview, focus group discussion with the stake holders has been carried out in accordance with involuntary Resettlement (IR) polices of Asian Development Bank (ADB). Safeguard policy Statement (SPS) 2009 aims to avoid land acquisition and limit the dislocation to minimize IR impacts. At construction areas where ROW has been encroached by the people, the road improvement works were confined to the available space instead of taking full width of ROW. It was to be ensured that required minimum space (7.3) is available at the construction area to make the road improvements as per design.

1.2 Description of Project Road

4. The project involves the rehabilitation of 06 major provincial roads in Sindh covering about 328 Km of the provincial highway network and 03 more additional roads from the saving of the loan agreement. These roads include (i) Sehwan – Dadu via Talti (ii) Jehan Khan (N-65) to Faizu Laro (N-55) via Chak (iii) Tando Allahyar to Chamber.

This report relates to Sehwan – Dadu Road which is one of the alignments taken up for rehabilitation & improvement in Sindh Provincial Road Improvement Project (SPRIP) through Asian Development Bank (ADB) Loan. This Project road is very important artery of Indus Highway (N-55) which connects Sehwan with Dadu via Talti and stretches to length of 32Km, has existing 110 ft. ROW. The scope of work consists of widening of road from 3.65 m to 7.3 m, however, there are no resettlement impacts observed.

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2.0. Field survey

Resettlement specialist conducted field survey from 3rd March to 4th March 2018. The observations and preliminary impact assessment findings are summarised below in Table-1 indigate that there will be no resettlement impacts.

Table-1: Preliminary Impact Assessment

CHAINAGE	ENCROACHMENT/LAND USE	OBSERVATIONS
06+200	A hair dresser shop located 10.5 feet (3.20 m) from center line (on left side) of the road will be partially affected	On right side sufficient space is available for construction of the road. No Resettlement required
09+100	A Mosque located 10 feet (3.05 m) from center line (on left side)will be partially affected	On right side sufficient space is available for construction of the road. No Resettlement required
11+100	A Mosque , 2 semi-pucca residential structures and graveyard are located within proposed construction limits.	Present road width at this site is 9.0 feet (2.74 m). Instead of road widening, existing road alignment of about 0.50 Km may be rehabilitated to save graveyard.
22+00 and 22+200	Few graves of the graveyard are located 10.5 feet (3.20 m) from center line (on Right side)will be affected	On left side sufficient space is available for construction of the road. No Resettlement required

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Pictures of Structures described in Table 1

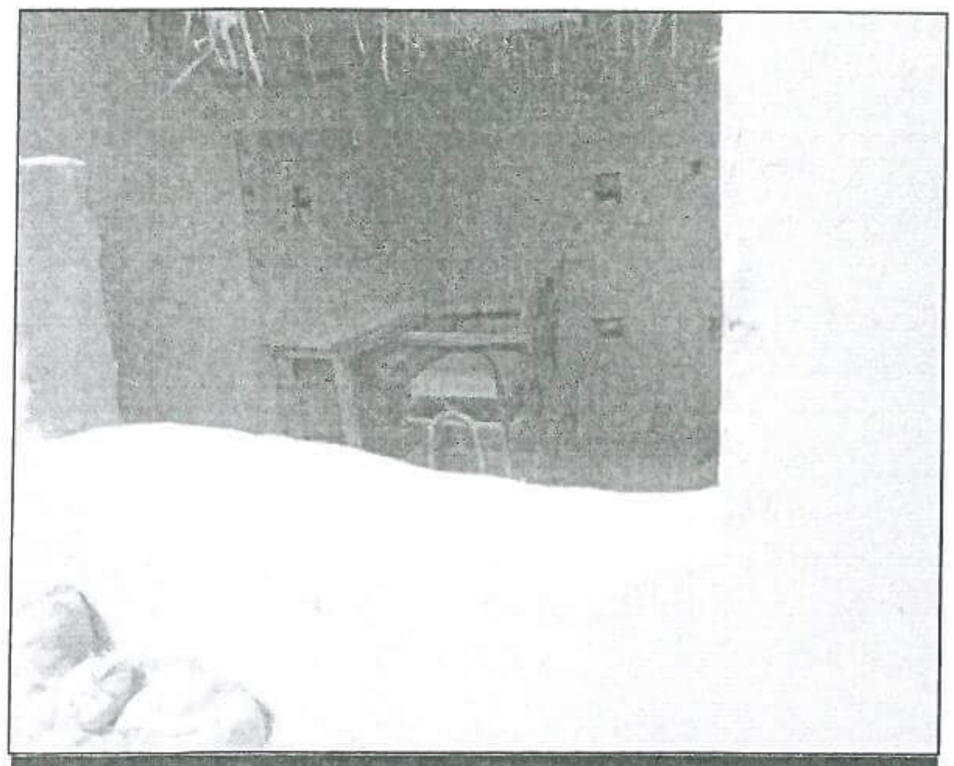

Figure 1 Hair dresser shop at chain age 06+200

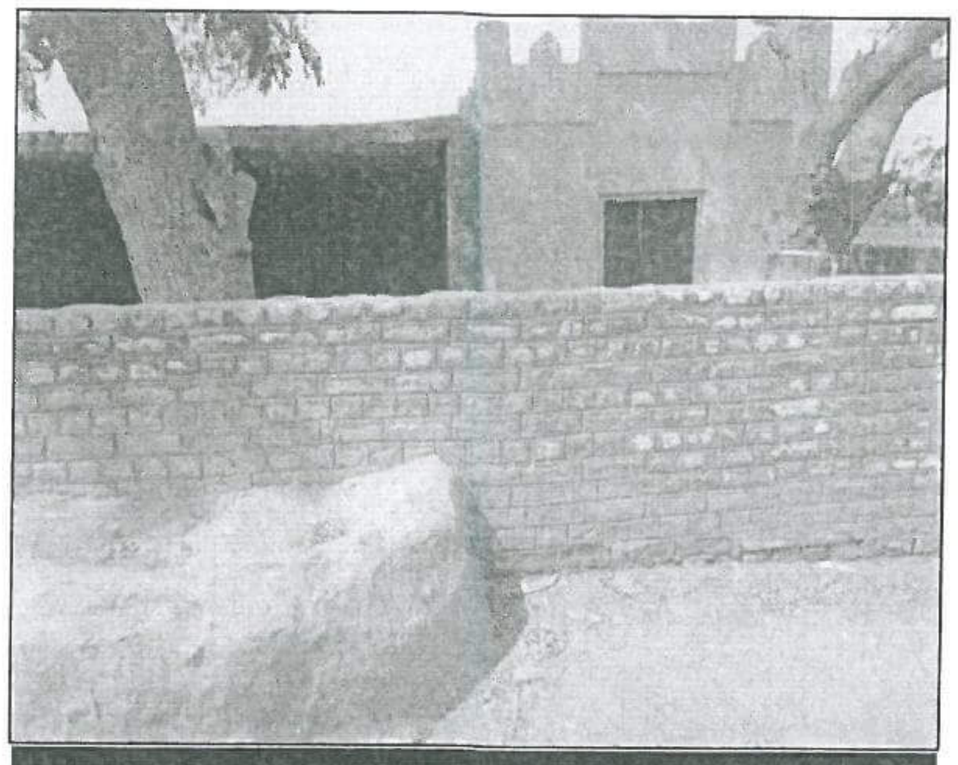

Figure 2 Mosque located at chainage 09+100

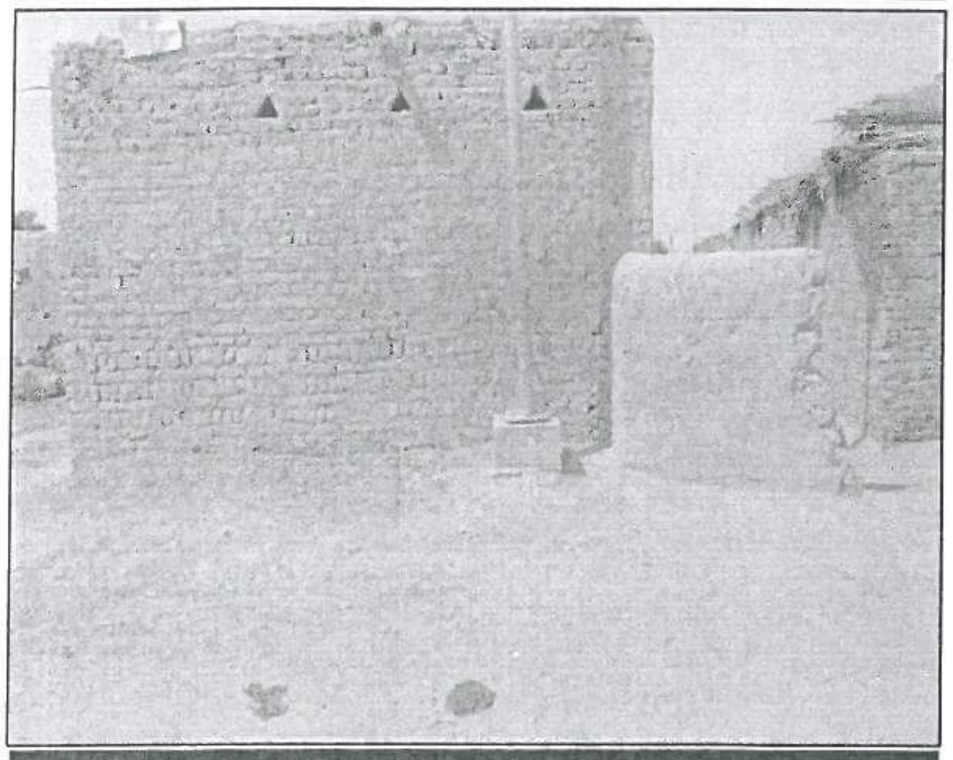

Figure 3 residential structure located at chainage-11+00

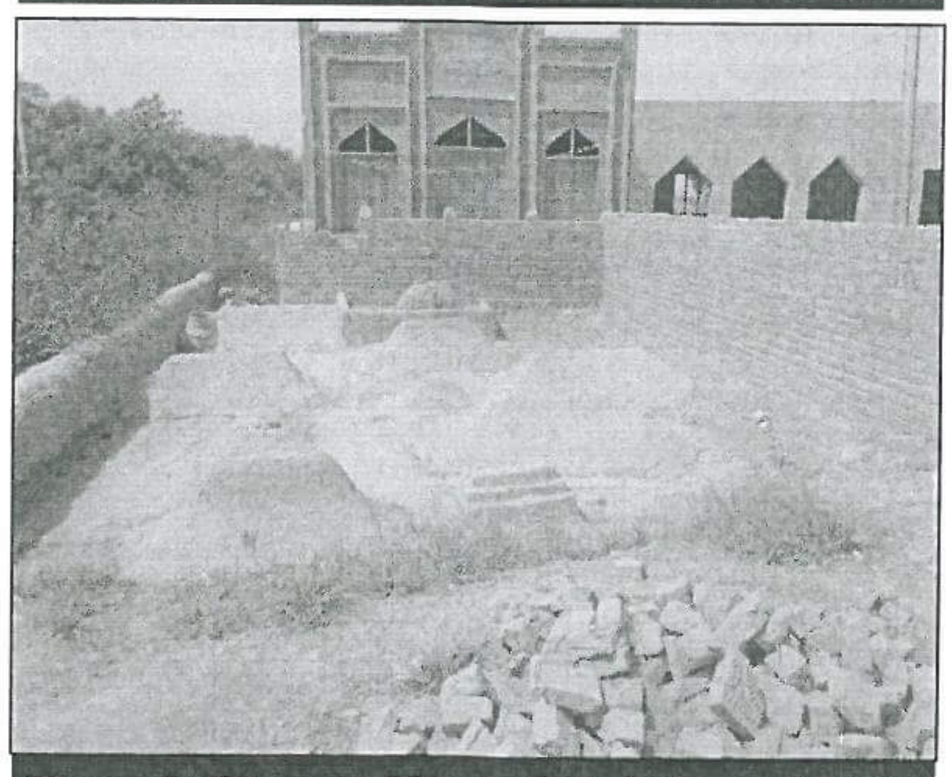

Figure 4 Gravevard located at chainage-11+00

Figure 5 Gravevard located at chainage-22+200

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3.0 Categorization Criteria

3. With regard to significance of resettlement impacts, ADB supported projects are classified into the following four categories:

- Category A. When a proposed project is likely to have significant involuntary resettlement impacts, a resettlement plan, which includes assessment of social impacts, is required.

- Category B. If a proposed project includes involuntary resettlement impacts that are not deemed significant, a resettlement plan, which includes assessment of social impacts, is required.

- Category C. When a proposed project has no involuntary resettlement impacts, further action with regard to resettlement planning is not required.

- Category FI. If a proposed project involves the investment of ADB funds to or through a financial intermediary, the financial intermediary must apply and maintain an environmental and social management system, unless all of the financial intermediary's business activities are unlikely to generate involuntary impacts.

4. In the Sehwan-Dadu road section rehabilitation project the completed Resettlement Screening Checklist classifies the Project as category C which does not require the preparation of a Resettlement Plan. The completed checklist is presented as Table -2 below.

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TABLE 2
Resettlement Screening Checklist

Investment Component: Sehwan-Dadu Road project

Potential for Involuntary Resettlement Effects*	Not Known	Yes	No	If yes, consider potential scope of resettlement effects
Will the project include any new physical construction work?		x		However, no private Land acquisition is required.
Does the project include widening of Highway		x		However, No Resettlemeny Impact
Are any environmental effects likely which may lead to loss of housing, other assets, resource use or incomes?		x		A graveyard and other structures as mentioned in Table-1 located at chainage 11+00.Therefore, existing alignment of the road may be rehabilitatd to avoid any resettlement issue at this site.
Is land acquisition likely to be necessary?			x	Involves WSD Land (ROW)
Is the site for land acquisition known?		NA		
Is the ownership status and current usage of the land known?		NA		Land belongs to WSD
Are non-titled people present on the site/within the corridor of Impact?			x	
Will there be loss of housing?			x	
Will there be loss of crops, trees, and other fixed assets through land use related changes?			x	Existing road is clear and no loss of any fixied assests is likley.
Will there be loss of incomes and livelihoods?			x	
Will people lose access to facilities, services, or natural resources through land use-related changes?			x	Project will facilitate smooth flow of traffic through urban area
Will any social or economic activities be affected through land use-related changes?			x	
Affected Persons and Severity of Impacts				
Any estimate of the likely number of those affected by the project? No () Yes () Not Applicable				
If yes, approximately how many? No land owners will be affected				
Any estimate of the severity of impact at the household level? None				
If yes, what?				
Any of these people poor, indigenous, or vulnerable to poverty risks? No (x) Yes ( )				
If yes, how?				

Date: **MARCH 2018**

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3.1 Decision on Categorization

Because the project falls in category "C", therefore no Resettlement Plan is required to be prepared.

3.2 Indigenous Persons

5. Impacts of ADB assisted projects on indigenous peoples is determined by assessing the magnitude of impact in relation to customary rights of use and access to land and natural resources; socioeconomic status; cultural and communal integrity; health, education, livelihood, and social security status; and the recognition of indigenous knowledge; and the level of vulnerability of the affected Indigenous Peoples community.

6. In considering impacts on indigenous peoples ADB supported projects are classified into the following four categories:

- Category A. A proposed project is likely to have significant impacts on indigenous peoples. An indigenous people plan (IPP), including assessment of social impacts, is required.
- Category B. A proposed project is likely to have limited impacts on indigenous peoples. An IPP, including assessment of social impacts, is required.
- Category C. A proposed project is not expected to have impacts on indigenous peoples. No further action is required.
- Category FI. A proposed project involves the investment of ADB funds to or through a financial intermediary. The financial intermediary must apply and maintain an environmental and social management system, unless all of the financial intermediary's business activities unlikely to have impacts on indigenous peoples.

7. In order to assess if the road improvement activities in Sehwan-Dadu section would have any potential impacts on indigenous peoples, an Indigenous Peoples Checklist, too, was completed during the field survey. The completed checklist assigns the Sehwan-Dadu road section improvement project into Category C where no further action is required with regard to impacts on Indigenous Peoples. The completed Indigenous Peoples Checklist is presented as Table -2 below

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TABLE 3: INDIGENOUS PERSONS SCREENING CHECKLIST

KEY CONCERN	YES	NO	NOT KNOWN	REMARKS
(Please provide elaborations on the Remarks column) **A. Screening for presence/absence of Indigenous Peoples**				
1. Are there socio-cultural groups present in or use the project area who may be considered as "tribes" (hill tribes, schedules tribes, tribal peoples), minorities (ethnic or national minorities), or indigenous communities in the project area?		x		
2. Are there national or local laws or policies as well as anthropological researches/studies that consider these groups present in or using the project area as belonging to "ethnic minorities", scheduled tribes, tribal peoples, national minorities, or cultural communities?		x		
3. Do such groups self-identify as being part of a distinct social and cultural group?		x		
4. Do such groups maintain collective attachments to distinct habitats or ancestral territories and/or to the natural resources in these habitats and territories?		x		
5. Do such groups maintain cultural, economic, social, and political institutions distinct from the dominant society and culture?		x		
6. Do such groups speak a distinct language or dialect?		x		
7. Has such groups been historically, socially and economically marginalized, disempowered, excluded, and/or discriminated against?		x		
8. Are such groups represented as "Indigenous Peoples" or as "ethnic minorities" or "scheduled tribes" or "tribal populations" in any formal decision- making bodies at the national or local levels?		x		
Overall assessment: IP present in project area **B. Identification of Potential Impacts**				
9. Will the project directly or indirectly benefit or target Indigenous Peoples?		x		
10. Will the project directly or indirectly affect Indigenous Peoples' traditional socio-cultural and belief practices? (e.g. child-rearing, health, education, arts, and governance)		x		
11. Will the project affect the livelihood systems of Indigenous Peoples? (e.g., food production system, natural resource management, crafts and trade, employment status)		x		
12. Will the project be in an area (land or territory) occupied, owned, or used by Indigenous Peoples, and/or claimed as ancestral domain?		x		
Assessment of Impact Categorization **(Please provide elaborations on the Remarks column)** **C. Identification of Special Requirements will the project activities include:**				
13. Commercial development of the cultural resources and knowledge of Indigenous Peoples?		x		
14. Physical displacement from traditional or customary lands?		x		
15. Commercial development of natural resources (such as minerals, hydrocarbons, forests, water, hunting or fishing grounds) within customary lands under use that would impact the livelihoods or the cultural, ceremonial, spiritual uses that define the identity and community of Indigenous Peoples?		x		
16. Establishing legal recognition of rights to lands and territories that are traditionally owned or customarily used, occupied or claimed by indigenous peoples?		x		
17. Acquisition of lands that are traditionally owned or customarily used occupied or claimed by indigenous peoples?		x		
Is Broad Community Consent Required		x		

Date: **MARCH 2018**

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4.0. Stakeholder Consultations

8. In compliance to the participation framework, consultations were made with the stakeholders and general public by the survey team. Consultative meeting were held to learn about the views and concerns of the public on the proposed development works. In order to enhance the project acceptability for the general public on social considerations, the main objectives of the consultation were to:-

a. Share information with stakeholders on the proposed improvement works and the expected impact on the socio-economic environment of the project corridor.

b. Understand stakeholder concerns regarding various aspects of the project, including the existing condition of the road, upgrade requirements, and the likely impact of construction–related activities and operation of the improved road.

c. Receive feedback from the stakeholders on their concerns regarding the project's input and mitigation measures suggested by them.

9. Three scoping sessions were conducted with local community during the month of March, 2018 in which Local Community was involved. A list of consultations and participants belonging to the category of representative of local community is given in below table.3

In addition to these official consultations were held with WSD officials in order to make the plan better and organized.

TABLE-4 LIST OF CONSULTATION PARTICIPANTS AND THEIR VIEWS

Serial NO.	Date	Location/ Venue	Contact Details	Name of Main Participants	Views /Concerns
1.	4-March, 2018	Ali Khanana	03469024548	✓ Ali Murad	Views of the participants were positive. They were willing for the road improvement.
2.	4-March, 2018	Ali Khanana	03338320858	✓ Muhammad Idrees	
3.	4-March, 2018	Ali Khanana	03015756231	✓ Muhammad Mithal	
4.	4-March, 2018	Ali Khanana	03136666337	✓ Javed Ahmad	
5.	4-March, 2018	Ali Khanana	03229118556	✓ Waheed Murad	
6.	4-March, 2018	Ali Khanana	03068325812	✓ Mushtaq Ahmad	
7.	4-March, 2018	Ali Khanana		✓ Rab Nawaz	
8.	4-March, 2018	Wadyon Manayo	0345-9655761	✓ Qaiser	The respondents were of the view that they need to be given proper identification of RoWs so
9.	4-March, 2018	Wadyon Manayo	0345-9655761	✓ Allah Warayo	

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Serial NO.	Date	Location/ Venue	Contact Details	Name of Main Participants	Views /Concerns
10.	4-March, 2018	Wadyon Manayo	0307-8460816	✓ Abdul Karim	as they can be able to take their property accordingly
11.	4-March, 2018	Wadyon Manayo	03136454531	✓ Liaqat Ali	The respondents offered full assistance and cooperation for rehabilitation & improvement of road.
12.	4-March, 2018	Wadyon Manayo	0314-5957100 0345-9201483 03459655761 0307-8460816 03136454531 0314-5957100 0345-9201483	✓ Ali Bux ✓ Abdul Waheed Brohi ✓ Ghulam Rasool ✓ Muhammad Sadique ✓ Abdul Jabbar ✓ Sherbaz ✓ Waris khan	
13.	4-March, 2018	Vehar Sharif		✓ Sultan Shah	The respondents mentioned that they are happy with the proposed project. They mentioned that they are facing severe problems of load shedding & gas. Above all they mentioned that they need government schools for primary level.
14.	4-March, 2018	Vehar Sharif		✓ Kashmir Bhayo	
15.	4-March, 2018	Vehar Sharif		✓ Mubarak	
16.	4-March, 2018	Vehar Sharif		✓ Sher Muhammad	
17.	4-March, 2018	Vehar Sharif		✓ Haji Kamal Din	
18.	4-March, 2018	Vehar Sharif		✓ Rehmat Ali	

5.0 GRIEVANCE REDRESSALAL PROCESS

10. It is very common that the affectees have the grievances in a development project, especially where the LAR is involved. Although, a legal mechanism is available in the form of Land Acquisition Act, 1894 to address the concerns of affectees related to land acquisition but there is no provision for resettlement and rehabilitation or livelihood restoration available for Displaced Persons (DPs) in the act. This leaves gaps in LAA and ADB policy as far as compensation and resettlement and rehabilitation aspects are concerned. In order to address these gaps and resulting concerns or grievances of DPs, a grievance redressal mechanism is required. Such mechanism is fundamental in achieving transparency in the resettlement process. It is ensured that DPs will know the procedure to approach and have full access to a Grievance Redressal Committee (GRC) that can investigate charges of irregularities/ ambiguities and complaints received from them and provide an early resolution.

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- A complaint register would be placed at camp sites of all packages for respective community so anyone can register their complaint in this register and on weekly basis; it is to be checked by the GRC.
- Before invoking formal grievance redressal system at the project level, the concerns of the aggrieved complainants will be examined at site. Assistance Engineer will, act as focal person in their respective territorial limits to get the grievances recorded, investigated and discussed.

5.1 First Level of GRM

11. If the grievance is not resolved at local level it shall be raised to formal grievance redressal mechanism which is first level of GRM. A formal complaint will be tendered with the Project Grievance Redressal Committee through the Assistant Engineer. Once the complaint is submitted with the Project GRC, it shall record it in the complaints register, without delay, and initiate the process of investigation through its technical and resettlement field teams. The complaint register is being maintained by the Assistant Engineer in project office.

5.2 Second Level of GRM

12 In case of dissatisfaction of the complainant, he/she will be referred by GRC to second level of GRM i.e. Environmental Safeguards Unit (ESU) of WSD within 07 days after communication of decision by the GRC. The ESU will acknowledge the complainant about his complaint, scrutinize the record of the GRC, investigate the remedies available and request the complainant to produce any record in favor of his claim. After thorough review and scrutiny of the available record on complaint visit the field and collect additional information if required.

13. Once the investigations are completed the ESU shall forward recommendations to the Project Director and the complainant accordingly within 15 days of receipt of the complaint. If the complainant is still dissatisfied with the decision, he can go to the local ombudsmen or follow ADB's accountability mechanism. At head quarter level, GRC will be headed by GM headquarter, Resettlement Expert, Environmentalist, Director Land and Assistant Director Land.

6.0 INSTITUTIONAL ARRANGEMENTS

13. A Safeguard Unit has been notified as per the ADB Guidelines is constituted. SU will be responsible for ensuring compliance to ADB Safeguards requirement during the implementation of the project. The unit shall oversee planning and implementation the safeguards management for both IR and Environment safeguards and shall ensure the requisite deliverables including but not limited to Due reports, final LARP &SSEMPs and periodic monitoring reports are submitted to ADB in a timely manner. The SU is composed of following PMU and PMC staff members:-

- Deputy Director (Safeguards Quality Control), PMU (Chairman)
- Assistant Engineer, SPRIP (Upper-Division SPRIP), PMU (Member of the Committee)
- Assistant Engineer, SPRIP (Lower Division SPRIP), PMU (Member of the Committee)
- Resettlement Specialist, PMC (Member of the Committee)
- Environmental Specialist, PMC (Member of the Committee)

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6.1. Functions and Responsibilities of Safeguard Unit

i) Conduct meaningful consultations with the Aps, and other stakeholders including government and non-government organizations to address issues related to environmental management and discuss the LAR issues of the project and remedial measures to offset the adverse impacts and shall maintain the record of such consultative meetings;

ii) Coordinate(on regular basis) with the grievance redressalal committee (GRC) and assist the GRC in delivery of its functions including but not limited to information dissemination and consultations with the complaints;

iii) Promptly inform ADB in case of any unanticipated environmental and /or social impacts with detailed description of the event(s), and propose a corrective action plan.

6.1.1 IR Safeguards:

i) Exercise its functions as LAR planning and implementation unit at site and with its routine functions shall formally assemble once in a month to review progress on project Land Acquisition and Resettlement issues and will prepare the social due diligence report, final LARP and periodic social monitoring reports for ADB review and clearance during implementation of project :

ii) Coordinate with the design review team and discuss concerns raised by Aps, and explore design related measures to be implemented for avoiding or minimizing the resettlement impacts to the possible extent ;

iii) Update the impact inventory and census of DPs based on the detailed design finalized after completing design review, and finalize the LARP for ADB review and clearance and maintain a LARP database;

iv) Ensure disclosure of the approved final LARP, disseminate project related information to relevant stakeholders including compensation eligibility criteria, entitlement provisions, assets valuation, compensation delivery and grievance redressal mechanisms and etc;

v) Maintain updated LARP database ,implement LAR activities, and assist PMU in review of LAR issues that may emerge during execution of civil works, prepare and implement corrective actions to ensure project implementation is consistent with SPS requirements;

vi) Track and monitor day –to-day LAR implementation progress and make adjustments in implementation schedule to achieve the targeted timelines;

vii) Consolidate the LARP implementation progress, prepare quality social monitoring reports periodically and share with ADB for review ,clearance and disclosure as required under the project.

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7.0 MANAGEMENT OF SOCIOECONOMIC IMPACTS / SOCIAL RISKS

14. The socioeconomic impacts / social risks of the Project have been determined and mitigation / enhancement measures provided. A management plan to this effect is provided as given in **Table 4**

TABLE–5 MANAGEMENT OF SOCIOECONOMIC IMPACTS / SOCIAL RISKS

Social Risk	Mitigation	Responsibility	Construction Stage
Land to be Acquired on Permanent Basis			
The project will be owned by WSD after rehabilitation & improvement. No land will be acquired on permanent basis.			
Temporary Land Acquisition			
Land required for establishing contractor's facilities including camp, workshop, plants, earth material and dumping excess spoil will be acquired directly from private landowners by the contractor. The provisions of the Land Acquisition Act, 1894 will not be invoked, as the acquisition of the land will be temporary and will be covered by short–term lease agreements between the landowners and contractors under the approval of the Resident Engineer. Rental terms will have to be negotiated to the satisfaction of the landowners concerned.	♦ The staff of the WSD and supervisory Consultants will monitor the process of restoration and ensure, through the terms of the construction contracts, that landowners are compensated according to the terms of the lease agreements, and the restoration actions agreed upon by the contractors are duly carried out. The photo–documentation of the existing land prior to temporarily acquisition should be available, which will be beneficial to resolve the restoration conflicts between the landowner and contractor. ♦ Similarly, prior to the commencement of construction activities, the Contractor will carry out base line survey for selecting the camp sites, dumping sites, public and community / private owned utilities, in conformity with the requirements of ADB Safeguard policy. The contractor will submit a development plan to the Engineer–in–charge and local government for its scrutiny and approval.	Contractor/ SC / SU Contractor / SC / SU	Construction Pre–Construction

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Social Risk	Mitigation	Responsibility	Construction Stage
	♦ Project facilities, viz., construction camp and workshop will be located at a minimum distance of 500 m from existing plantation, and settlements, etc. This limit will be 1000 m in case of batching plant.	Contractor / SC / SU	Pre–Construction
	♦ As far as possible, waste / barren land i.e. areas not under agricultural, residential or forestation use, and natural areas will be used for material (if required) and setting up project facilities.	Contractor / SC / SU	Construction
	♦ Where the use of agricultural land is unavoidable for of earth material, the top 30 cm of the plough layer will be stripped and stockpiled for redressaling the land after the required material has been removed. In case deep ditching is carried out, the top 1 m layer of the ditching will stripped and stockpiled. The ditch will initial filled with scrap material from construction then leveled with the stockpiled topsoil to make it even with the rest of the area. It shall be ensured that the scrap does not contain any material that may produce obnoxious material that would contaminate soil or water resources.	Contractor / SC / SU	Construction
	♦ Barren lands or valley side slopes will be used for dumping the excavated spoil material. Appropriate sites have to be located along the road for this activity.	Contractor / SC / SU	Construction
	♦ These facilities will be regularly monitored and cleaning activities implemented during operation phase to improve the cross drainage facilities of area.	SC / SU	Operation
Increased risk of accidents caused by partial closure of road during rehabilitation works			

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Social Risk	Mitigation	Responsibility	Construction Stage
♦ During construction activities, traffic flow will be disturbed. At sections passing through populated areas, there will be limited scope for providing diversion tracks for the mobility of local and thorough traffic that will increase the risk of accidents.	♦ Proper site specific measures will be carried out in consultation with supervisory consultants to ensure the safety of population residing along and around the project corridor. Site specific Traffic Management Plans (TMPs) will be prepared and implemented by the Contractor with the approval of the Project Engineer..	Contractor / SC / SU	Construction
	♦ During operation stage WSD will make arrangements with some organization / contractor for proper maintenance and operation of the proposed Intervention. Periodic inspections will be made by the contracted firm to identify the problem areas and their remedial measures. For this purpose the firm should be fully equipped and there should be contingency plan in case of any emergency / natural disaster.	WSD	Operation
Problems to Health and Safety of Labor and Employees on Construction Work and Provision of Safety Equipment to Workers on Site.			
♦ Occurrence of accidents / incidents during the construction activities, particularly from excavation activities is common. The workers and general public residing along the project corridor or near the work sites will particularly be at risk.	♦ Complying with the safety precautions for construction workers as per International Labor Organization (ILO) Convention No. 62, as far as applicable to the project contract.	Contractor / SC / SU	Construction
	♦ Training of workers in construction safety procedures, social awareness, equipping all construction workers with safety boots, helmets, gloves, and protective masks, and monitoring their proper and sustained usage.	Contractor / SC / SU	Construction
♦ Contractor staff while on work may get injuries.	♦ Contractor will ensure the provision of medicines, first aid kits, vehicle, etc. at the camp site.	Contractor / SC / SU	Construction
Gender Issues			

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Social Risk	Mitigation	Responsibility	Construction Stage
♦ The rural women normally use the open field latrines and their privacy may suffer due to the project activities. Moreover, they actively participate in other outdoor socioeconomic activities such as livestock rearing, bringing of potable water, etc which may also be affected by the project activities.	♦ The Contractor will select the specific timings for the construction activities particularly near the settlements, so as to cause least disturbance to the local population particularly women.	Contractor / SC / SU	Construction
	♦ The Contractor will carry out the construction activities in such a way that the open field latrine usage timings by the local community particularly women, should not be affected. The normal timings to use the toilet facilities by the rural women are early in the morning and at late in the evening. So, the Contractor will have to take care of these timings.	Contractor / SC / SU	Construction
♦ The induction of outside labor may create social and gender issues due to the unawareness of local customs and norms. It may also cause hindrance to the mobility of local women for working in the field, herding livestock, picking fuel wood, etc.	♦ Contractor will take due care of the local community and observe sanctity of local customs and traditions by his staff. Contractor will warn the staff strictly not to involve in any un–ethical activities and to obey the local norms and cultural restrictions particularly with reference to women.	Contractor / SC / SU	Construction
	♦ During construction activities, if privacy of the nearby households is affected, the Contractor will inform the house owner to make some arrangements. Similarly, Contractor will take care as much as possible that the construction activities should not affect the privacy particularly with reference to women.	Contractor / SC / SU	Construction

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Social Risk	Mitigation	Responsibility	Construction Stage
Social Conflicts and Employment of Locals on the Project			
The presence of outside construction workers may cause some degree of social disruption and even active disputes with the local community as a result of social / cultural differences. This particularly relates to the disruption of the privacy of women working in the fields or even in the yards of their houses, should the house lying at lower elevation than the working sites. Likewise the risk of theft of the community assets by the Contractor workers and vice versa may occur.	♦ Good relations with the local communities will be promoted by encouraging Contractors to provide opportunities for skilled and unskilled employment to the locals, as well as on–the–job training in construction for young people. Contractor will restrict his permanent staff to mix with the locals to avoid any social problems. ♦ The Contractor will warn the workers not to involve in any theft activities and if anyone would involve in such type of activities, he will have to pay heavy penalty and would be handed over to police. Similarly, at the time of employing, Contractor has to take care that the workers should be of good repute. The Contractor camp will be properly fenced and main gate will be locked at night with a security guard to check the theft issues from community side.	Contractor / SC / SU	Construction
Rise in the Prices of Essential Commodities			
Due to induction of outside labour for project works, the demand for basic items will increase thereby causing an increase in the prices of essential commodities	The project will exert no negative impacts on the prices of essential commodities. It is estimated that project will employ about 120 skilled and un–skilled staff. Most of the un–skilled labour will be recruited from the local areas. As such there will be no extraordinary increase in the demand for essential or other commodities. The Contractor, will, however, be required to maintain the field camps supplies from the main market.	Contractor	Construction
Use of Local Water Supplies and Other Common Resources			
♦ Local water supplies will be required to meet campsite and construction requirements, bringing its use into competition with the use by the local communities.	♦ The contractor will explore the alternative water resource so that the existing community water resources are not impacted. No existing water source under the use of community will be exploited by the Contractor for campsite facilities as well as construction purposes.	Contractor	Construction

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Social Risk	Mitigation	Responsibility	Construction Stage
♦ Local water may be affected due to implementation of project both in quantity as well as quality.	♦ Availability of water for campsite facilities and construction purposes will be ensured by the Contractor prior to start of construction activities. As per Local Government Act, the contractor will seek approval from the local government for exploitation of the water resources.	Contractor / SC / SU / Local Govt.	
	♦ The Contractor will be required to maintain close liaison with local communities to ensure that any potential conflicts related to common resource utilization for project purposes are resolved quickly.	Contractor	
	♦ The contractor will prepare guidelines for the workers for minimizing the wastage of water during construction activities and at campsites.	Contractor	
Possibility of Spread of HIV / AIDS Amongst the Project labor and Adjoining Population	♦ Contractor to arrange HIV / AIDS awareness programs in the field camps on regular basis by a qualified expert / doctor.	Contractor	
	♦ Contractor will provide recreational facilities such as playing volleyball of football after the work hours.	Contractor	
	♦ Similarly, he will provide indoor recreation in terms of radio and TV at the eating place.	Contractor	
	♦ The Contractor will ensure regular medical check–up of the camp staff from a qualified doctor on fortnightly basis. If any person found affected with any of the transmittal diseases will be immediately shifted from the camp to the hospital for detailed check–up and treatment. The cost will be borne by the Contractor.	Contractor	
	♦ Contractor will restrict his permanent staff to mix with the locals to avoid any social and health problems.	Contractor	
Recreational Facilities for Public	♦ The Contractor will ensure the restoration and rehabilitation of construction and camp sites on completion of the project.	Contractor	Post Construction

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Social Risk	Mitigation	Responsibility	Construction Stage
	♦ WSD will develop parks particularly for children and ladies at appropriate sites along the road to provide them better recreational opportunities. This will also attract the outside tourists as well, thus increasing the incomes of the local people through increased socio–economic activities.	WSD	Post Construction
	♦ WSD should carry out tree plantation along the road.	WSD	Post Construction
Restricted Mobility			
♦ During the construction phase the general mobility of the local residents and their livestock in and around the project area is likely to be hindered. Likewise access to the natural resource may be affected. This particularly implies to the women and children.	♦ The contractor will ensure that the mobility of the local communities and their livestock is not hindered by the construction activities. The contractor will provide crossing points at the road at appropriate places to facilitate the people for going across the road for their daily works and having free access to the natural resources.	Contractor / SC / SU	Construction
♦ Construction activities, particularly excavation and movement of haul truck and machinery may disrupt the existing tracks leading from the main road to settlements. This will limit the accessibility of the local population to the main road.	♦ Generally the contractor will avoid using the village tracks for hauling the construction material. However, if it is unavoidable, the existing ones will be widened, overlaid with shingle or surface treated to accommodate local as well as contractors traffic under the approval of the Project Engineer.	Contractor / SC / SU	Construction

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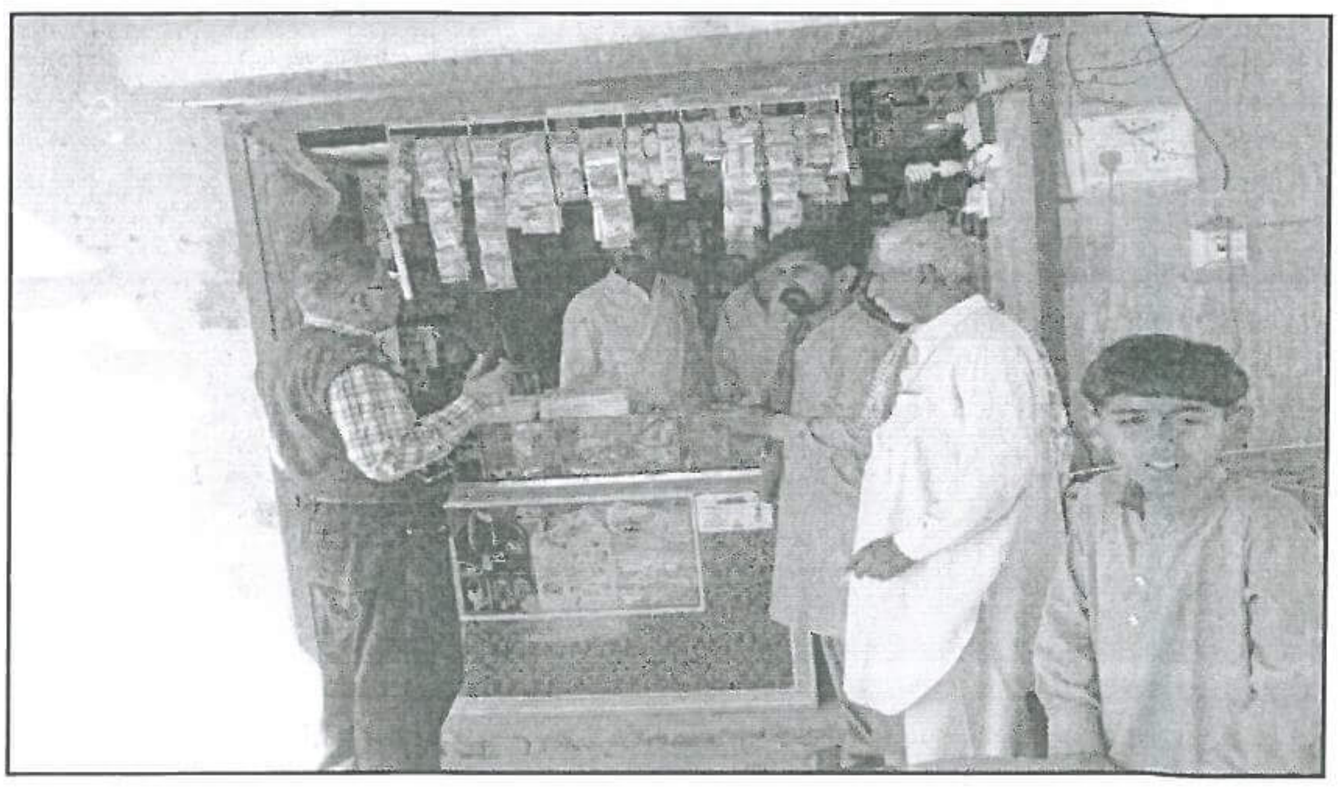
Pictorial Presentation

Sehwan-Dadu Road



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