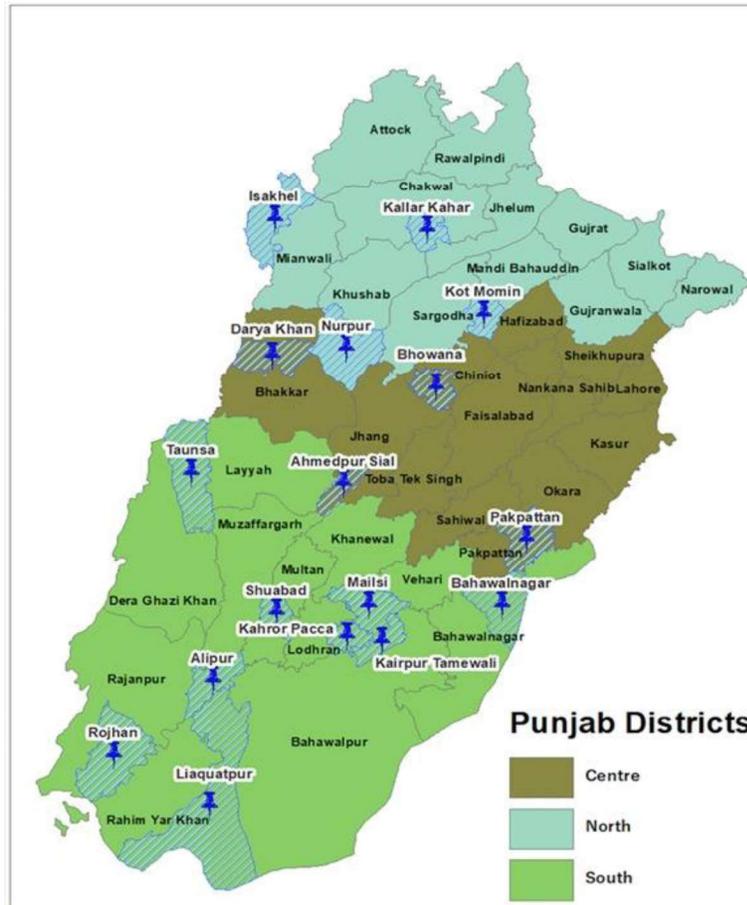




## ENVIRONMENT & SOCIAL MONITORING PLAN



## PUNJAB RURAL WATER SUPPLY AND SANITATION SYSTEM PROJECT (PRSWSS)





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## LIST OF ABBREVIATION

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ABR	Anaerobic Baffled Reactor
Aoi	Area of influence
BDL	Below detection limit
BHU	Basic Health Unit
BMPs	Best Management Practices
BOD	Biochemical Oxygen Demand
BOQs	Bills of Quantities
BPs	Bank Procedures
CBD	Convention on the Biological Diversity
CBO	Community Based Organization
CC	Construction Contractor
CFT	Cubic foot
CO	Carbon Mono Oxide
COD	Chemical Oxygen Demand
DC	Design Consultant
DC	Design Consultant
DG	Directorate General
EA	Environmental Assessment
ECO	Economic Cooperation Organization
ECO	Economic Cooperation Organization
EDCS	Engineering, Design & Supervision Consultancy Services
EE	Environmental Engineer
EHS	Environmental, Health & Safety
EIA	Environmental Impact Assessment
ENE	East-Northeast
EPA	Environmental Protection Agency
EPD	Environmental Protection Department
ERPs	Emergency Response Procedures
ESC	Environmental and Social Cell
ESMF	Environmental Social & Management Framework
ESMMP	Environment and Social Management AND Monitoring Plan
ESMP	Environment and Social Management Plan
ESS	Environmental & Social Safeguard
GAP	Gender Action Plan
GBV	Gender Based Violence
GHG	Greenhouse Gas
GIIP	Good International Industry Practice
GPD	Gallons per Day
GRC	Grievance Redressal Committee
GRM	Grievance Redress Mechanisms
HDPE	High Density Polyethylene



HHs	Households
HSE	Health, Safety & Environment
IEE	Initial Environmental Examination
LG	Local Government
LPG	Liquefied Petroleum Gas
MGD	Million Gallon per Day
MS	Medical Superintend
MSDS	Material Safety Data Sheets
NCS	National Conservation Strategy
NE	North East
NESPAK	National Engineering Services Pakistan
NGOs	Non-Governmental Organizations
NNE	North-Northeast
NNW	North-Northwest
NO	Nitrogen Oxide
NO2	Nitrogen Di Oxide
NOC	No Objection Certificate
NTU	Nephelometric Turbidity Unit
NW	North west
O&M	Operational and Maintenance
O3	Ozone
OHS	Occupational Health & Safety
OHWT	Overhead water Tank
OIC	Organization of the Islamic Conference
OP	Operational Policy
PATs	Pakistan Approaches to Total Sanitation
PCC	Public Complaints Center
PD	Project Director
PDWP	Provincial Development working party
PEPA	Punjab Environmental Protection Agency
PEQS	Punjab Environmental Quality Standards
PGA	Peak Ground Acceleration
PGA	Peak Ground Acceleration
PICs	Public Information Centers
PIMU	Project Implementation and monitoring unit
PIU	Programme implementation unit
PKR	Pakistan Rupees
PLGA	Punjab Local Government (Amendment)
PM	Particulate Matter
PPE	Personal Protective Equipment
PRMSC	Punjab Rural Municipal Services Company
PRSWSSP	Punjab Rural Sustainable Water Supply and Sanitation Project
PWA	Punjab Water Act
RCC	Reinforced Cement Concrete
ROW	Right of Way
SAARC	South Asian Association for Regional Cooperation
SBC	Seismic Building Code



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SC	Supervision Consultant
SDS	Social Development Specialist
SDU	Service Delivery Unit
SEA	Sexual Exploitation and abuse
SH	Sexual Harassment
SO2	Sulfur Di Oxide
SOP	Standard Operating Procedures
SPM	Suspended particulate Matter
STDs	Sexually Transmitted Diseases
STI	Sexually Transmitted Infections
STP	Sewage Treatment Plant
SWM	Solid Waste Management
TC	Total Coliforms
TCU	True Color Unit
TDS	Total Dissolve Solids
THQ	Tehsil Head quarter
TOR	Terms of Reference
TPV	Third Party Verification
TSS	Total Suspended Solid
UNCCD	United Nation Convention to Combat Desertification
UNESCO	United Nation Educational Scientific and Cultural Organization
UNFCCC	United Nations Framework Convention on Climate Change
UNO	United Nations Organization
WASH	Water, Sanitation and Hygiene
WB	World Bank
WBG	World Bank Guideline
WHO	World Health Organization
WNW	West-Northwest
WWTP	Wastewater Treatment Plant



## Executive Summary

### 1. Introduction

The Local Government & Community Development Department (LG&CDD), Government of Punjab, through its Punjab Rural Municipal Services Company (PRMSC), a company registered under section 42 of “The Companies Act 2017”, is implementing Punjab Rural Sustainable Water Supply and Sanitation Project with the (PRSWSSP)” in target area of 2000 villages in 16 tehsils of Punjab with the proposed assistance of the World Bank. To implement this project Punjab Rural Municipal Services Company (PRMSC) has divided the 16 tehsils into 6 zones depending of geographical location and hired the services of 6 Engineering Design and Supervisory Consultants (EDCS) for the proposed project titled “Consultancy Services for Engineering Design and Construction Supervision of Punjab Rural Sustainable Water Supply & Sanitation Project (PRSWSS).

The goal of PRSWSSP is to improve sanitation conditions, provide clean drinking water, improve living conditions through solid waste management, behavior change, and capacity building for the sustainability of the project in rural settlements of Punjab.

Through various studies, it has been proven that poor condition of Water, Sanitation and Hygiene (WASH) not only affects the health of masses, but it also adversely affects the economic growth of the region. Recently, a number of mega initiatives have been launched by the Government, and international organizations in the urban areas of all provinces of Pakistan for the improvement of water and sanitation but the rural areas still remain neglected. Rural settlements of Punjab, which hold 73% of the province’s population living in 23,000 revenue villages, are in dire need of investments to improve WASH.

Outcomes of various studies and sector assessments, have identified requirements for improving climate resilience and planned economic growth of 2,000 villages that will be part of the project. Poverty, water contamination, stunting, and sanitation condition of the areas have been taken as basic parameters for the selection of project sites/tehsils.

The Government of Punjab, with the assistance of the World Bank, will finance complete detailed engineering designs through Engineering, Design & Supervision Consultancy Services (EDCS) under the pilot phase project in the revenue villages of Geographical based Cluster named “Central-I” of selected districts. The services will assist in; (i) design documentation, including Sub-scheme/Project Document (PC-I), Bill of Quantities, for water supply and sanitation services to achieve economies of scale and desired results, and (ii) resident supervision of infrastructure development.

In a progress review meeting/ kick-off workshop convened by PRMSC dated 29.11.2022 at the office of PRMSC, it was agreed that the Consultants shall prioritize some villages in the assigned Cluster called as priority villages. The 6 EDCS consultants selected 26 villages of 8 relevant tehsils for the provision of Water Sanitation and Hygiene (WASH) facilities.

The anticipated environmental and social impacts of the selected 26 are mostly localized, site-specific and temporary; few (if any) of them are irreversible and could be easily mitigated



through appropriate measures. According to the findings of the Environmental and Social Screening study, this project falls in Category E2 and requires an ESMP.

As per Punjab Environmental Protection Agency (PEPA), review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations 2022, Schedule-II, EIA is required for 'Water Supply, Sewerage System and Treatment (Category F).

This Environmental and Social Management Plan (ESMP) has been prepared for the proposed project in line with World Bank Operational Policies (OPs) and Environmental Social & Management Framework (ESMF) for PRSWSSP. The current study covers various impacts of the design, construction, and operation of water supply, sewerage, and solid waste management facilities. It is to be noted that this ESMP remains a live document, subject to modifications as the project design and technical specifications are finalized or modified prior to the implementation stage.

## **2. Policy, Legal and Administrative Framework**

The national and provincial Government has promulgated laws/acts, regulations, and standards for the protection, conservation, rehabilitation, and improvement of the environment. The Punjab Environmental Protection Agency (PEPA) is the regulatory authority, which has provided guidelines for conducting Environmental Impact Assessment (EIA) studies and has the authority to issue regulatory clearance/ No Objection Certificates (NOCs) for various projects.

In addition to the laws of the land, World Bank Operational Policies (OPs) are also applicable to the project including Environmental Assessment (OP 4.01), Natural Habitat (OP 4.04), Physical Cultural Resources (OP 4.11), Involuntary Resettlement (OP 4.12), Gender policy (OP 4.20), and Access to information (BP 17.50).

## **3. Project Description**

The villages selected for provision of Water Sanitation and Hygiene (WASH) facilities. The subproject involves provision of water supply, sewerage, overhead tanks & Pumping stations with sewage treatment plants in all five.

The villages in the project area are facing grave issues related to water supply and sewerage.

### **Water Supply Issues:**

- No water supply network in the villages;
- Most of the Household use shallow groundwater, which is not fit for drinking;
- Polluted groundwater is causing water borne diseases.

### **Sewerage Issues:**

- There is no sewerage system in the project area;



- Existing open drains are damaged and collect sewage only from some houses;
- No proper Disposal Point in all the villages;
- Sewage collected in soakage pits and open plots seeps into ground and contaminates groundwater;
- Raw sewage ponds are a breeding ground for diseases.

The project is scheduled to be completed in 10 months. The estimated total cost for construction of proposed project is **3562.56** million PKR. This cost is tentative and will be finalized with the detailed technical design of the proposed project. Total man power required on site for proposed Project will be approximately 20-30 workers per day per village.

#### **4. Baseline Profile**

As per the environmental screening study conducted earlier, the project falls in “Category E2” which means that the impacts of the project activities are limited and within the boundary of project area. Therefore, the whole village has been considered Area of Influence (Aoi).

##### **A. Physical Environment**

The proposed project sites are rural settlements comprising residential and agriculture areas. The topography of the project area is predominantly flat except for Kallar Kahar that is hilly region. The ground elevations vary from 350 to 610 ft in flat areas where as 1920 – 2368 ft in Kallar kahar.

Punjab’s area mostly consists of an alluvial plain formed by the southward-flowing Indus River and its four major tributaries in Pakistan, the Jhelum, Chenab, Ravi, and Sutlej rivers. The general slope of the land is from northeast to southwest, but it rises in the areas between rivers. Approximately 70 percent land area of the province comprises flood plains of Indus basin. Geologically, lands in the flood plains are lightly mantled with alluvial deposits transported from the Himalaya foothills. The underlying bedrock is composed of Precambrian metamorphic and tertiary consolidated rocks. The overlying alluvium consists of Pleistocene to recent unconsolidated deposits of sand, clay and silt.

The project area has extreme climate. It has hot summer and cold winters. The summer starts from May and lasts till September. June is the hottest month. The mean maximum temperature varies from 37 – 46 °C for month of June in relevant tehsils. The winter seasons lasts from November to February. January is the coldest month. The mean minimum temperature varies from 3 °C and 7 °C in January in relevant tehsils. Maximum precipitation days are observed during June. The dominant wind speed throughout the year is ranges between 10 -16 km/hr.

Groundwater investigation study reveals that the groundwater is abundantly available in the project area at depth of 30 to 60 ft, except for the villages of Liatpur and Kallar Kahar. Liatpur is water logged. Whereas Kallar kahar is hilly area and groundwater lies at the depth of more than 300 feet and still source is not promising.



The Project Area is located in Seismic Zone 2A except for Kallar Kahar that is located in Seismic Zone 2B. The Zone 2A has Peak Ground Acceleration (PGA) in the range of 0.08 g to 0.16 g and Zone 2b has PGA in range of 0.16 g to 0.24g.

## **B. Biological Environment**

Project areas are rich in biodiversity because of its diverse landscape and geographical location. The variety of ecosystem is evident and is home to various species. The following section describes the biological environment of the project area.

Common animals found in the project area include dogs, cats, house rats and bats. Domestic livestock observed during field visits include buffaloes, cattle, goats, sheep, and donkeys that are used by the local residents for their livelihood.

Major crops ripen and cultivated are Wheat, Fodder, Rice, Sugarcane, Cotton, Maize and Barseen.

The major floral species found in the project area include Jand trees, Karir, Beri, Van, Kikar, Shisham, Aak and Kikar.

There are no endangered species of either flora or fauna in the project tehsils. Neither any wetlands nor any wildlife is present in and around the project area.

## **C. Social Environment**

Socioeconomic baseline was established using primary and secondary data. Detailed site visits were conducted by Social Experts of consultants to appraise the prevailing socioeconomic conditions and to assess the socioeconomic impacts of the proposed project. During the field surveys, interviews and consultation meetings were held with the local representatives i.e., Numberdars, residents (Males & Females), shopkeepers, land owners, agriculturists, and their laborers, etc., in 26 priority villages.

Primary data was collected through a socioeconomic survey with the help of a structured and un-structured questionnaire. Randomly sample was conducted in all twenty-six (26) priority villages of eight (08) tehsils of Center, North and South. Secondary data was collected from the Pakistan Bureau of Statistics (Census 2017), established literature, and research.

## **5. Public Consultation and Information Disclosure**

Engagement with stakeholders and disclosure is an integral part of the project's environmental and social assessment. The methods used for public consultation with project stakeholders in order to ascertain their stakes regarding project implementation were general/public meetings, rapid participatory appraisal, and on-site meetings.

Different categories of interested parties including project staff, government officials, and local communities were consulted to predict the nature and scale of risks, challenges, and



impacts of the project perceived by them. Concerns raised by the locals are as followed. In **Table ES1**.

**Table ES1: Concerns raised by locals and their response**

Sr. No	Concerns Raised	Response
1	There is no public water supply and people rely on the conventional methods of water collection i.e. Boreholes etc.	The objective of the proposed project is to provide clean drinking water to all the residents of the community at their doorsteps through a piped network.
2	There is no sewerage system and the sewage is being disposed of in open lands which create nuisance.	The sewage will be connected through a piped network and will be disposed of after adequate treatment through a wastewater treatment plant.
3	There is no collection of solid waste and the waste is dumped directly in the open plots and streets which create nuisance	A comprehensive solid waste collection system will be developed and waste containers shall be placed at appropriate locations in the villages. PRMSC will collect the solid waste through bins and will transport it to the designated disposal site.
4	The residents of the village are ready to pay the bills for the water supply services. But they have some concerns regarding the billing procedure. They want to know does billing based on household consumption, household size or lump sum amount has to be paid.	Water meters are already in the plan as part of the project and will be provided soon to the community. The water meter will be installed at the household level whereas bulk water metering is installed on each network.
5	The construction activities will cause inconvenience to local residents due to hindrance in routine activities	The contractor will ensure that construction work do not create disturbance for local people's access to the local route and their routine life activities.
6	Noise and dust will be generated from construction activities and may cause health issues.	Regular sprinkling of water will be carried out to control the dust emissions at the construction site, whereas construction activities will be avoided during night time.
7	Recreation facilities such as parks and playgrounds should be provided.	Provision of recreation facilities is not the mandate of the proposed project; however, the concern has been noted and will be reported to the higher authorities.

## 6. Anticipated Environmental Impacts and Mitigation Measures

The construction activities would cause changes in topography, soil contamination, surface & groundwater pollution, air pollution, noise & vibration, solid waste generation, disturbance to flora and fauna, overburdening of resources, construction camps issues, health & safety issues, emergency situations, traffic disruption and social issues.



Anticipated impacts during operational stage will include water pollution, air pollution, soil contamination, ecological disturbance, solid waste generation, occupational health & safety issues and emergency situations.

The positive impacts of the project include, improved water supply system, improved sewerage system, improvement in public health, hygiene and sanitation, landscape, economic development, employment generation, development of deprived villages, formation of model villages, synergetic development with cooperation of NGOs, CBOs and other organizations.

## **7. Environmental and Social Management and Monitoring Plan**

Recommended mitigation measures to control potential adverse impacts are described in the Environmental and Social and Management Monitoring Plan (ESMMP). ESMMP shall become the part of construction contract agreement and shall be strictly enforced during the implementation of the proposed project.

The proponent PIMU-PRMSC will be responsible for compliance of with environmental and social safeguard requirements of the proposed project.

The proposed project activities will be monitored and managed by the PIMU-PRMSC. The Environmental and Social Cell (ESC) staffed by qualified environmental and social specialists has already been established under PRSWSSP. The ESC will be the custodian of the ESMP. ESC will support ensuring the compliance of ESMP. ESC will submit progress reports for the implementation of the ESMP to WB and PEPA as per environmental approval/ NOC conditions for the PRSWSSP.

### **Grievance Redress Mechanism (GRM)**

The Grievance Redressal Mechanism (GRM) will be consistent with the requirements of the World Bank safeguard policies to ensure the mitigation of community concerns, risk management, and maximization of environmental and social benefits. The overall objective of the GRM is therefore to provide a robust system of procedures and processes that provides for transparent and rapid resolution of concerns and complaints identified at the village level.

The PIMU at the Local Government & Community Development Department (LG&CDD) level will serve as the Secretariat for the Grievance Redressal Committee (GRC Directorate) that will be responsible for providing oversight on the entire GRM process at a strategic level and monitoring complaints management.

The complaints may be lodged through:

- Tracking complainant(s) from subprojects sites (field and community level) to PIMU;
- Dedicated staff to update the database routinely;
- Promote transparency, publicize how complaints are being handled, and periodically evaluate the overall functioning of the mechanism;
- Processes for informing stakeholders about the status of a case; and



- Procedures to retrieve data for reporting purposes, including the periodic reports, from Village and Tehsil and document them into the monthly progress reports at PIMU.

GR (Village level) will be responsible to receive, log, and resolve complaints at the village level. The Grievance Redress Committee at the village Panchayats will review and identify actions to be taken to address the complaints at its weekly meeting. If not resolved timely then complaint would be referred to GRC-Tehsil Level (SDU-TO) within 3 days after receiving.

GRC-SDU-TO will try to resolve the complaints in a satisfactory manner anyhow, if not satisfactorily resolved by the village panchayats/councils and Tehsil level, then the grievance will be referred for consideration by GRC at the PIMU/LG&CDD level within one week.

Every effort will be made to address or resolve grievances within the following fixed timelines, which will be an indicator of the performance of the handling system. Acknowledgment of a written submission will be issued to the complainant within three working days.

If the complainant is not satisfied, the complaint will have the option to seek redress through the court of law.

### **Environmental Budget**

The total estimated cost for the implementation of ESMP is worked out to be about **PKR 88.642 million**.



## INTRODUCTION

### General

The Local Government & Community Development Department (LG&CDD), Government of Punjab, through its Punjab Rural Municipal Services Company (PRMSC), a company registered under section 42 of “The Companies Act 2017”, is implementing Punjab Rural Sustainable Water Supply and Sanitation Project with the (PRSWSSP)” in target area of 2000 villages in 16 tehsils of Punjab with the proposed assistance of the World Bank. To implement this project Punjab Rural Municipal Services Company (PRMSC) has divided the 16 tehsils into 6 zones depending of geographical location and hired the services of 6 Engineering Design and Supervisory Consultants (EDCS) for the proposed project titled “Consultancy Services for Engineering Design and Construction Supervision of Punjab Rural Sustainable Water Supply & Sanitation Project (PRSWSS) as under:

**Table 1 : Project Area Details**

Cluster	Name of Consultant	Tehsil	Pilot Villages	Priority Villages
South-I	Asian Consulting Engineers	Bahawalnagar	22	2
		Khairpur Tamewali	12	2
South-II	JERS Consultancy Pvt. Ltd.	Alipur	10	-
		Karor Pacca	11	5
		Shuja Abad	12	-
South-III	NESPAK	Liaqatpur	19	6
		Rojhan	8	-
		Taunsa	13	-
Central-I	NESPAK	Ahmad Pur Sial	10	-
		Bhawana	13	5
		Darya Khan	9	-
Central-II	Osmani & Company Pvt. Ltd.	Pakpattan	24	3
North	Techno Consult International	Isa Khel	10	-
		Kalar Kahar	8	2
		Kot Momin	10	1
		Noorpur Thal	9	-
		<b>Total</b>	<b>200</b>	<b>26</b>

The goal of PRSWSSP is to improve sanitation conditions, provide clean drinking water, improve living conditions through solid waste management, behavior change, and capacity building for the sustainability of the project in rural settlements of Punjab.

This Environmental and Social Management Plan (ESMP) has been prepared for the 26 priority villages of the proposed project in line with World Bank Operational Policies (OPs) and Environmental Social & Management Framework (ESMF) for PRSWSSP. The current study



covers various impacts of the design, construction, and operation of water supply, sewerage, and solid waste management facilities.

## **Project Background**

Punjab is the most populous province of Pakistan with 110 million inhabitants out of which 70 million population resides in rural areas<sup>1</sup>. Despite being the largest province with reference to population, the people living in rural areas of Punjab have been deprived of improved water and sanitation facilities for so long which contribute to child stunting, malnutrition and water borne diseases.

Poverty and Shared Prosperity Report, 2020<sup>2</sup> reveals that 4 out of 5 people live below the international poverty line in rural areas. Studies conducted in different periods of time have linked improved water and sanitation facilities with the alleviation of poverty and urged governments to provide high-quality water and sanitation facilities in order to uplift the people from the marshes of poverty and devastating socio-economic conditions.

Despite making significant efforts by the people at the helm of the affairs in Pakistan to improve the prevailing situation, 44% population of Punjab still does not have access to improved water and sanitation facilities as per globally established standards. Reports show that 3 in 5 households in Punjab use E-Coli contaminated water and every 25th household in Punjab lacks access to the improved sources of drinking water. Similarly, the situation of sanitation is also immensely deplorable.

Through various studies, it has been proven that poor condition of Water, Sanitation and Hygiene (WASH) not only affects the health of masses, but it also adversely affects the economic growth of the region. Recently, a number of mega initiatives have been launched by the Government, and international organizations in the urban areas of all provinces of Pakistan for the improvement of water and sanitation but the rural areas still remain neglected. Rural settlements of Punjab, which hold 73% of the province's population living in 23,000 revenue villages, are in dire need of investments to improve WASH.

Outcomes of various studies and sector assessments, have identified requirements for improving climate resilience and planned economic growth of 2,000 villages that will be part of the project. Poverty, water contamination, stunting, and sanitation condition of the areas have been taken as basic parameters for the selection of project sites/tehsils.

The Government of Punjab, with the assistance of the World Bank, will finance complete detailed engineering designs through Engineering, Design & Supervision Consultancy Services (EDCS) under the pilot phase project in the revenue villages of six (06) Geographical based Clusters of selected districts. The services will assist in; (i) design documentation, including Sub-scheme/Project Document (PC-I), Bill of Quantities, for water supply and sanitation services to achieve economies of scale and desired results, and (ii) resident supervision of infrastructure development.

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<sup>1</sup> [https://pwd.punjab.gov.pk/population\\_profile](https://pwd.punjab.gov.pk/population_profile)

<sup>2</sup> <https://www.worldbank.org/en/publication/poverty-and-shared-prosperity-2020>



In a progress review meeting/ kick-off workshop convened by PRMSC dated 29.11.2022 at the office of PRMSC, it was agreed that the Consultants shall prioritize some villages in the assigned Cluster called as priority villages as indicated in **table 2**.

**Table 2: Name of Priority Villages in Different Tehsils**

Zone	Tehsils	No of Priority Villages	Priority Villages
Canter-I	Pakpattan	02	Arifabad
			Dhaku Chishti
Center-II	Bhawana	05	Sochan
			Chak 190
			Chak 192
			Chak 199
			Chak 221
North	Kallar kahar	02	Chak 226
	Kot Momin	01	Makhyal
South-I	Bahawalnagar	02	Gahi
			Naseerpur Khurd
	Khairpur Tamewali	02	Chak M Zaman
South-II	Kahrur Pacca	05	Chak Sadiq Nagar
			Sheikh Wahan
			ISA
			Choki Rangu Khan
			Chowki Soba Khan
South-III	Liaqatpur	06	Dhora Mahar
			Gulhar
			Muhammad Pur
			Chak 5
			Chak 17
			Chak 25
			Chak 26
			Chak 29
			Chak 30

The anticipated environmental and social impacts of the selected twenty six (26) priority villages are mostly localized, site-specific and temporary; which could be easily mitigated through appropriate mitigation measures. According to the findings of the Environmental and Social Screening study, this project falls in Category E2 and requires an ESMP.

As per Punjab Environmental Protection Agency (PEPA), review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations 2022, Schedule-II, EIA is required for 'Water Supply, Sewerage System and Treatment (Category F).

### Objective of ESMP

The objective of this ESMP is the identification of possible environmental and social impacts of the proposed project on both short and long-term bases. Based on the level and nature of these observations, the ESMP delineates proper mitigation measures. As a planning tool, the ESMP aims to ensure that environmental, socio-economic, and cultural issues throughout the entire project lifecycle are anticipated and considered by the project proponent. It also serves



as a framework for establishing project controls to reduce or prevent adverse environmental or socio-economic impacts.

The specific objectives of this ESMP are:

- To assess the existing environmental and socioeconomic conditions of the project area;
- To identify potential impacts of the proposed interventions on the environmental, ecological, and social aspects of the project area, to predict and evaluate these impacts and determine their significance;
- To propose appropriate mitigation measures that should be incorporated in the design of the project to avoid or minimize (if cannot eliminate) the potentially adverse impacts;
- To assess the compliance status of the proposed activities with respect to the national and provincial environmental legislation and WB's OPs;
- To provide institutional, monitoring, reporting, and documentation measures for environmental safeguards compliance; and
- To aid decision-makers in taking informed decisions.

### **Scope of ESMP**

The ESMP identifies the potentially significant impacts of the proposed project and suggests the applicable mitigation measures to avoid, minimize or reduce the magnitude of the impacts. It will also indicate the institutional and training requirements to implement mitigation measures during the construction and operation of the proposed project.

The current ESMP presents a preliminary roadmap for the environment and social management for the construction and operation of the water supply scheme, sewerage network and sewage treatment plant (STP) in all twenty six (26) selected priority villages of 8 tehsils.

### **Contractual Requirements/ Obligations of ESMP**

The impacts and their mitigation measures, summarized in ESMP, will be part of the Bidding Documents to ensure that Contractors implement ESMP recommendations at all project stages. The ESMP requirements will be part of the Contract and the details prescribed in the ESMP will be mandatory. The ESMP will be equally applicable to Subcontractors, including nominated Subcontractors (if any).

At the stage of the bidding process, the Contractor will be instructed to carefully consider the requirements for environmental and social management contained in this ESMP when preparing the bid and pricing the items of Work. The Contractor will need to accept that the prescriptions and clauses detailed in the ESMP are an integral part of the Contract for relevant items of Work; unless separate items are included in the Bill of Quantities (BoQs). The Contractor will need to accept that separate payment will not be made in respect to compliance with the ESMP. The Contractor should, therefore, be aware that in case the Contractor or Subcontractors fail to implement the ESMP recommendations, the Engineer shall take necessary action(s) to ensure that the ESMP is properly implemented and/or to rectify the damages caused by such negligence.



## Proponent and the Consultant

	Cluster	Name of Consultant	Address
<b>Punjab Rural Municipal Services Company</b>  Head Office, 5th Floor, KD Plaza, Opposite Zoom Petrol Pump, MM Alam Road, Lahore	South-I	Asian Consulting Engineers	C-03 Jhelum Block, Green Forts-II, Jhelum Block Green Forts 2, Lahore
	South-II	JERS Consultancy Pvt. Ltd.	24 Civic Center St, Township Twp Commercial Area Lahore
	South-III	NESPAK	1-C, Block-N, Model Town Extension, Lahore
	Central-I		
	North	Techno Consult International	Office # B-2, Lower Ground Floor, Shah Tower, Plot # 3&4, E-11/2, G 6 Markaz Blue Area, Islamabad
	Central-II	Osmani & Company Pvt. Ltd.	IEP Building, Liberty Roundabout Lahore, Block D1 Gulberg III, Lahore

## Approach & Methodology to Work

### Approach

The study has been conducted in accordance World Bank Safeguards policies (OP 4.01, OP 4.04, OP 4.11, OP 4.12, OP 4.20 & BP 17.50) applicable to this project. Further, Punjab Environmental Protection Agency (PEPA) guidelines were also considered in preparation of this document. The study is based on both primary and secondary data and information. The primary data includes data collected from field i.e., information about existing conditions; environmental sampling and analyses for air, water and noise; environmental sensitive receptors, ecological survey; social survey including demographic characteristics, income dependency & quality of life, occupation, and social amenities etc. The secondary data includes a review of relevant information from literature and previous reports. Discussions were held with stakeholders including government officials, community representatives and a wide range of local communities. The main purpose of this approach was to obtain an impartial impression of the people's perceptions of the project and its environmental and social impacts.

The assessment remains subject to change with respect to the finalization of technical specifications and alignment of the proposed sewer, water supply lines & location of overhead tanks, pumping station, and STP.

### Methodology



The following methodology was adopted to develop the ESMP of the proposed Project:

#### **A. Orientation**

Meetings and discussions were held among the members of the ESMP Consulting Team. This activity is aimed at achieving a common ground of understanding various issues of the Study.

#### **B. Data Collection Planning**

Subsequent to the concept clarification and understanding obtained in the preceding step, a detailed data acquisition plan was developed for the internal use of the ESMP Consulting Team. The plan included; identification of specific data requirements and their sources; determination of time schedules and responsibilities for their collection and the indication of the logistics and other supporting needs for the execution of the data acquisition plan. Field surveys were then conducted based on the data collection plan.

#### **C. Detailed Field Survey**

Detailed site visits and technical visits for environmental monitoring and social assessment for the collection of data were conducted in December, 2022. The data collected from the field include:

- Identification of environmentally sensitive receptors including air-sensitive receivers, noise-sensitive receivers, and water bodies expected to receive pollutant load;
- Sampling and analysis for air, noise wastewater, and groundwater;
- Ecological survey;
- Socioeconomic survey including public consultation;
- Stakeholders' consultations;

#### **D. Sampling & Analysis of Physical Environmental Parameters**

EPA Certified Laboratories (i.e. Pak Green, Green Environmental Monitoring and ASIAN Laboratories) were hired for environmental monitoring. The Laboratories were mobilized from December 2022 to January 2023 for collection of water and wastewater samples as well as air and noise monitoring.

#### **E. Review of Secondary Data**

Previous environmental and social soundness assessment for 16 tehsils was collected in order to gain a complete understanding of existing environmental conditions of the area including:

- **Physical environment:** topography, geology, soils, surface and groundwater resources, and climate;
- **Biological environment:** flora and fauna (particularly rare or endangered species), critical habitats/zones, and vegetation communities within the project area;
- **Socio-economic environment:** settlements, socio-economic conditions, infrastructure, and land use.



- **Heritage aspects:** sites of cultural, archaeological, or historical significance.

#### **F. Review of Environmental and Social Laws and Institutional Requirements**

The project needs to comply with all the applicable national and provincial environmental and social policies, laws, guidelines, acts, and legislations and World Bank's Operational Policies (OPs) requirements. All these requirements and policies were reviewed.

#### **G. Area of influence (Aol)**

A team comprises of environmental and social experts, including environmental engineers, sociologists, ecologists, gender specialists & enumerators etc., of both client and consultant staff, carried out the environmental and social survey of the Aol to familiarize themselves with the local conditions and the environmental settings. During the survey, information regarding the topography, soil, rock, surface water, groundwater, flora and fauna, forested areas, and social settings along the Aol was demarcated. Considering the project interventions simultaneously in primary settlement as well as number of secondary settlements of revenue village, the whole village is demarcated as area of influence of the sub project.

#### **H. Environmental and Social Baseline Survey of the Project**

Environmental and social surveys were carried out within the Aol to establish the baseline of the project area from December 2022 to January 2023. Prior to the start of field activities, comprehensive checklists, proformas, and maps were developed to gather the following information:

##### **(i) Physical Environment**

The following information was acquired for the establishment of the physical environment baseline:

- Topography;
- Water resources (including available surface and groundwater resources and natural streams, hydrology, water supply, water contamination etc.);
- Climate data (including temperature, precipitation, humidity, wind speed, direction etc.);
- Water, surface water, ambient air quality and noise level monitoring data;
- Existing water supply and sewerage systems;
- Seismology;
- Geology
- Environmental Sensitive Receptors.

##### **(ii) Ecological Environment**

- Flora (trees, herbs, shrubs, grasses, and overall vegetation including valuable or rare trees and their loss due to implementation of the Project, etc.);
- Fauna/ Wildlife (Mammals, reptiles, amphibians, and avifauna.);
- Reserved forests, Guzara forests, Community forests/ Private forests, and wildlife sensitive or notified areas in Aol;
- Migratory birds' corridors; and



- Endangered species (both flora and fauna).

### **(iii) Socio-Economic Environment**

Analysis is carried out on the basis of secondary data within the Aol in order to develop the socio-economic baseline information of the general settled population. Several socio-economic parameters were covered in the socio-economic baseline survey of the sample population settled within the Aol in the light of primary and secondary data. These aspects include the following:

- Demographic characteristics;
- Nature of business/occupation;
- Livelihood/income;
- Living standard of the population;
- Community Institution available;
- Gender issues;
- Housing construction patterns;
- Mode of transport;
- Basic amenities of the project area;
- Health facilities/ Educational facilities.; and

#### **I. Stakeholder Consultations**

There are two categories of stakeholders in the project:

- Community stakeholder
- Institutional stakeholder

For the current study, community stakeholder consultations were carried out by the consultants through following techniques:

- Formal/ informal meetings (through village numberdars, politically influentials, Community resource persons)
- Individual interviews
- Group Discussions

The institutional stakeholder consultation session was carried out jointly by consultant and client by holding meetings at the offices of relevant government functionaries. The study teams met with the institutional stakeholders, affected persons and local communities in and around the project area. The objective of the consultation was to disseminate information on the project and its expected impact, long-term as well as short-term, among primary and secondary stakeholders and to gather information on relevant issues so that the feedback received could be used to address these issues at an early stage. Stakeholder consultation is discussed in detail in chapter 5.

#### **J. Impact Assessment and Mitigation Measures**

A logical and systematic approach was adopted for impact identification and assessment. The process began during the screening and continued through scoping which identified the key



issues and classified them into different categories. The tools were used for impact assessment, through environmental and social screening checklists for impact assessment of construction and operational phase.

Identification of potential environmental and social impacts in terms of their nature, magnitude, extent, location, timing, and duration was carried out. The impacts were correlated to the Project location, design stage, construction as well as operation stage. Based on the impacts prediction methods and as a result of public/stakeholder consultations, ESMP team screened the adverse environmental and social impacts for inclusion in the mitigation measures and environmental and social management plan.

ESMP team proposed practicable, economically feasible and socially acceptable mitigation measures for the significant adverse environmental and social impacts. Details of mitigation measures are provided in chapter 6.

### **K. Structure of ESMP**

The structure of this ESMP is listed below:

**Section 1: Introduction** briefly presents the project background, objectives, methodology and need of the study.

**Section 2: Legal and Administrative Framework** Lists national as well as provincial laws, regulations and procedures and applicable World Bank Operational Policies (OPs).

**Section 3: Project Description** provides an overall description of the project including proposed networks, design considerations and concepts, manpower requirement, waste generation, machinery and material requirements.

**Section 4: Baseline Profile** gives a description of baseline physical, biological and socio-economic conditions of the project area.

**Section 5: Public Consultation and Information Disclosure** identify the main stakeholders and their concerns raised during scoping sessions and deal with the measures to mitigate the social impacts.

**Section 6: Anticipated Environmental and Social Impacts and their Mitigations Measures** identify, predict, and evaluate the impacts of the project activities during the construction and operation stages and deal with the measures proposed to mitigate potential environmental impacts of the proposed project.

**Section 7: Environmental and Social Management & Monitoring Plan** This section outlines the organizational framework, mitigation, and monitoring plans, and training requirements, defines roles and responsibilities and estimates budget requirements for satisfactory implementation.



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## LEGAL AND ADMINISTRATION FRAMEWORK

### 2.1 General

This section deals with the current environmental policy as well as legal and administrative framework required to develop Environmental & Social Management Plan (ESMP) for the proposed interventions in selected priority villages of 16 tehsils. All relevant provisions of environmental policies laid down by the Government of Pakistan, Government of Punjab along with applicable World Bank Policies have been duly discussed and the project proponent will be required to adhere to these regulations throughout the course of the project. The institutional arrangement for compliance to these laws has been described in ESMP (Section 7).



## 2.2 Summary of Key National Strategies, Policies, Acts and Legislation

The summary of key national strategies, policies, acts and legislation from environmental perspective are briefly described in **Table 3** below:

**Table 3: Key National strategies / policies, legislation / Acts, Laws and Regulations and Their Relevance to the Project**

Sr. No.	Policy/Strategy	Brief Coverage	Relevance to project
1	Fatal Accidents Act 1855	<p>An act to provide compensation to family's loss occasioned by the death of a person caused by actionable wrong. It is enacted as follows:</p> <ul style="list-style-type: none"> <li>Suit for compensation to the family of a person for loss occasioned to it by his death by actionable wrong</li> <li>Not more than one suit to be brought</li> <li>Plaintiff shall deliver particulars etc.</li> <li>Interpretation clause</li> </ul>	The provisions of this act would be applicable if any fatal accident occurs during the execution of construction works for the proposed Project.
2	Pakistan Penal Code 1860	<p>It authorizes fines, imprisonment or both for voluntary corruption or fouling of public springs or reservoirs so as to make them less fit for ordinary use.</p>	The provisions of the Penal Code, 1860 are applicable to the project in terms of penalties for effecting human lives and public property. It also addresses the control of noise, air emissions, and effluent disposal.
3	Land Acquisition Act, 1894 (Including Later Amendments)	<p>The primary law for acquisition of land for public purposes in Pakistan is the "Land Acquisition Act, 1894". The Land Acquisition Act, 1894, is a "law for the acquisition of land needed for public purposes and for companies and for determining the amount of compensation to be paid on account of such acquisition". The exercise of the power of acquisition has been limited to public purposes.</p>	Private land if required will be acquired through VLD in this project. However, the state's land will be preferred and used for the construction of overhead tanks, pumping stations & STP.
4	Protection of Trees and Brushwood Act, 1949	<p>This Act prohibits cutting or lopping of trees and brushwood without permission of the Forest Department.</p>	This act will be applicable to the proposed project in term of Tree Cutting which lies in jurisdiction of Forest Department.
5	Pakistan Antiquities Act 1975	<p>The protection of cultural resources in Pakistan is ensured by the Antiquities Act of 1975. Antiquities have been defined in the Act as ancient products of human activity, historical sites, or sites of</p>	The provisions of this act would also be applicable, if any accidental archaeological discoveries may occur during the



Sr. No.	Policy/Strategy	Brief Coverage	Relevance to project
6	National Conservation Strategy 1992	<p>anthropological or cultural interest, national monuments etc. The act is designed to protect antiquities from destruction, theft, negligence, unlawful excavation, trade and export. The law prohibits new construction in the proximity of a protected antiquity and empowers the Government of Pakistan to prohibit excavation in any area, which may contain articles of archaeological significance. NOC would be requested from DG Archeological Department for construction within 200 feet of cultural heritage sites.</p> <p>Pakistan National Conservation Strategy (NCS), which was approved by the federal cabinet in March 1992, is the principal policy document on environmental issues in the Country. The NCS outlines the Country's primary approach towards encouraging sustainable development, conserving natural resources and improving efficiency in the use and management of resources. The NCS has 68 specific programs in 14 core areas in which policy intervention is considered crucial for the preservation of Pakistan's natural and physical environment.</p>	<p>excavation works for the construction of proposed Project.</p> <p>The core areas that are relevant in the context of the proposed project are pollution prevention during construction, conserving, biodiversity and supporting forestry and plantation.</p>
7	Guidelines for Public Consultation, 1997	<p>The Pakistan Environmental Protection Ordinance 1997 requires public participation during the review of an EIA (Section 12(3)). The "Policy and procedures for the filing, review and approval of environmental assessments" requires proponents to consult with the affected community and relevant NGO's during the preparation of an environmental report. Public involvement is a feature of environmental assessment and can lead to better and more acceptable decision-making.</p> <p>The objectives of public involvement include:</p> <ul style="list-style-type: none"> <li>• informing the stakeholders about what is proposed;</li> <li>• providing an opportunity for those otherwise unrepresented to present their views and values, therefore allowing more sensitive consideration of mitigation measures and tradeoffs</li> </ul>	<p>These guidelines are applicable for the preparation of the EIA / ESMP.</p>
8	Guidelines for Review and Preparation of	<p>These guidelines describe the format and content of IEE/EIA reports to be submitted to Provincial EPA/EPD for obtaining NOC.</p>	<p>These guidelines are applicable for the preparation of the EIA.</p>



Sr. No.	Policy/Strategy	Brief Coverage	Relevance to project
	Environmental Reports, 1997	<p>The guidelines present:</p> <ul style="list-style-type: none"> <li>• The environmental assessment report format;</li> <li>• Assessing impacts;</li> <li>• Mitigation and impact management and preparing an environmental management plan;</li> <li>• Reporting;</li> <li>• Review and decision making;</li> <li>• Monitoring and auditing; and Project Management.</li> </ul>	
9	National Sanitation Policy, 2006	<p>The National Sanitation Policy of Pakistan, 2006, stresses on the safe disposal of excreta away from the dwellings, creation of an open defecation-free environment and, promotion of health and hygienic practices in the country.</p>	<p>This policy is applicable to the project for the efficient management of solid waste or wastewater during construction or operation phase of the project.</p> <p>This project primarily focused on provision of improve sanitation services in target areas.</p>
10	Protection Against Harassment of Women at the Workplace Act, 2010	<p>The Protection Against Harassment of Women at the Workplace Act refers to sexual harassment at the workplace.</p>	<p>This Act will be applicable to the project if women are employed for the construction of the proposed Project or women living in near vicinity of the project area.</p>
11	Canal and Drainage Act 1873 and Amendment Act, 2016	<p>This Act prohibits corruption or fouling of water in canals (defined to include channels, tube wells, reservoirs and watercourses), or obstruction of drainage.</p>	<p>This act is applicable to the project for the efficient management of wastewater disposal during the construction or operation phase of the project.</p>
12	Panchayats and Neighborhood's Councils Act, 2019	<p>The Panchayats and Neighborhoods Councils Act, 2019 (PVPNCA 2019) was repealed in February 2021 through an amendment to the PLGA 2019. The result was the Punjab Local Government (Amendment) Ordinance 2021 that established a new tier of local government at the village level called Village Councils, which incorporated the main functions of village panchayats prescribed in the PVPNCA 2019 with regard to water, sanitation, and waste management.</p>	<p>This act is applicable to the proposed project, village councils is informed about the project and will remain in contact during the construction or operation phase of the project.</p>



### 2.3 Key Provincial Strategies / Policies, Legislation / Acts, Laws and Regulations

The provincial policies, strategies, acts and laws relevant for the environmental safeguard of the project activities are given below in **Table 4**.

After the 18th amendment to the constitution of Pakistan, many subjects, including environmental protection and pollution prevention, have been devolved to the provincial jurisdiction. Therefore, the apex environmental statute governing the proposed project will be the Punjab Environmental Protection Act 1997. However, detailed rules, regulations and guidelines required for the implementation of the policies and enforcement of legislation are still in various stages of formulation and discussion. The following description presents a brief overview of the relevance of various existing provincial policies, legislation and guidelines.

**Table 4: Key Provincial strategies / policies, legislation / Acts, Laws and Regulations and Their Relevance to the Project**

Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
1	Punjab Land Revenue Act, 1967	WHEREAS it is expedient to consolidate and amend the law relating to the making and maintenance of records-of-rights, the assessment and collection of land-revenue, the appointment and functions of Revenue Officers and other matters connected with the Land Revenue Administration in the Province of the Punjab, or incidental thereto	The provisions of this act would be applicable during the implementation of the proposed project.
2	Punjab Plantation and Maintenance of Trees Act, 1974	The Punjab Plantation and Maintenance of Trees Act, (1974) regulates tree plantations and enforces measures for their protection. The requirements of this act are applicable in terms of planting new trees and their maintenance by the owner of the proposed Project land who would have the physical possession.	This act would be implemented if any tree cutting activity involved during construction.
3	The Punjab Wildlife (Protection, reservation, Conservation & Management) Act, 1974	This act provides for the protection, preservation, conservation and management of wildlife in the Province of Punjab. This act defines the wildlife sanctuary, game reserves, protected areas, and national parks. It also defines the rules and responsibilities of the relevant authorities and the relevant personnel to protect ecological resources. It also describes the penalties and punishments on offenses against the sections given in the act.	This policy is to avoid any disturbance to ecological system near project area due to construction activities.
4	Punjab Land Acquisition Rules, 1983	This Law provides for the acquisition of land needed for public purposes and for Companies, and determines the amount of compensation to be made on account of such acquisition. The Collector of the District may make a preliminary investigation on any land in any locality that may be needed for any public purpose or for a Company. The Commissioner, for land acquired for a public purpose, or the Provincial Government for land acquired for a Company, when satisfied of the result of the investigation, shall publish a notification in the Official Gazette. Following this, a declaration of intended acquisition shall be published, and shall state the district or other territorial division in which the land is situate, the purpose for which it is needed, its approximate area, and, where a plan shall have been made of the land, the place where such plan may be inspected (Part II). The amount of compensation shall then be settled, and if any dispute arises the Collector may refer such dispute to the decision of the Court (Part IV and V). Part VI deals with procedures for the temporary occupation and use of any waste or	Private land if required will be acquired through VLD in this project. However, the state's land will be preferred and used for the construction of overhead tanks, pumping stations & STP.



Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
5	The Motor Vehicles Rules, 2000	<p>arable land needed for any public purpose or for a Company. The acquisition of land for companies is provided for in Part VII. Part VIII contains provisions of miscellaneous nature.</p> <p>Subject to the provisions of this Act, and the rules and regulations, no person shall operate a motor vehicle from which air pollutants or noise are being emitted in an amount, concentration or level which is in excess of the National Environmental Quality Standards, or where applicable the standards customary under clause (g) of sub-section (l) of section 6.</p>	<p>During Construction all these rules will be followed to avoid emission of air pollutant from vehicles.</p>
6	<p>Guidelines and Checklists adopted by Government of Punjab after 18<sup>th</sup> Amendment</p>	<p>Post the adoption of the 18th Constitutional Amendment in 2011, the subject of environment was devolved and the provinces have been empowered for environmental protection and conservation. The Punjab Environmental Protection Act, 1997 (as Amended upto 2022) is comprehensive legislation and provides the legislative framework for protection, conservation, rehabilitation and improvement of the environment. The „environment“ has been defined in the Act as: (a) air, water and land; (b) all layers of the atmosphere; (c) all organic and inorganic matter and living organisms; (d) the ecosystem and ecological relationships; (e) buildings, structures, roads, facilities and works; (f) all social and economic conditions affecting community life; and (g) the interrelationships between any of the factors specified in sub-clauses „a“ to „f“.</p>	<p>All projects to be implemented in Punjab must comply with PEQS during all the phases i.e., construction and operation. No Objection Certificate (NOC) shall be required from Punjab Environmental Protection Agency (PEPA) before commencement of construction.</p>
7	Punjab Drinking Water Policy 2011	<p>The overall objective of Punjab's Water Policy is to provide clear policy directions to the Government of Punjab on the sustainable management and development of water from all sources of water (surface water, groundwater and rainwater), for all sub-sectors of water use (domestic, stock water, agriculture, industry).</p>	<p>This policy is applicable and drinking water supply will be designed according to this policy guidelines.</p>
8	Punjab Environmental Tribunal Rules, 2012	<p>According to Section-31 of the Punjab Environmental Protection Act, 1997 (XXXIV of 1997), the Tribunal shall make every effort to dispose of a complaint or an appeal or other proceedings regarding environmental problems associated with the construction and development of any project within sixty days from the date of filing of the complaint, appeal or other proceedings but any decision of the Tribunal shall not be rendered invalid by reason of any delay in the disposal of complaint, appeal or other proceedings.</p>	<p>This is applicable to dispose of a complaint or an appeal or other proceedings regarding environmental problems associated with the construction and development of any project within sixty days from the date of</p>



Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
11	Punjab Antiquities Amendment Act, 2012	The Punjab Antiquities Amendment Act, 2012 is adopted from the Pakistan Antiquities Act of 1975 with a few minor changes. The law will be applicable to the proposed project mainly due to its provision that „any construction activity within 61 meter or 200 ft. of protected antiquities, are prohibited“. The provisions of this act would also be applicable, if any accidental archaeological discoveries may occur during the excavation works for the construction of proposed Project.	filing of the complaint; appeal or other proceedings. The provisions of this act would be applicable, if any accidental archaeological discoveries may occur during the excavation works for the construction of proposed Project.
12	Punjab Government Musalihat Anjuman (Constitution and Functions) Rules, 2016	The dispute may be brought to the Musalihat Anjuman. The Musalihin shall make every reasonable effort in encouraging and assisting the parties in arriving at an amicable settlement but for this purpose shall not impose, coerce or try to dictate terms for any specific resolution of the dispute.	The provisions of this rule would be applicable, if any dispute occur during the execution of proposed Project.
13	Punjab Environmental Quality Standards (PEQS), 2016	In exercise of the powers conferred under clause (c) of sub-section (1) of section 4 of the Punjab Environmental Protection Act, 1997 (XXXIV of 1997), the Environmental Protection Council has approved the Punjab Environmental Quality Standards (PEQS), 2016. They endow information on the permissible limits for discharges of municipal and industrial effluent parameters and industrial gaseous emissions in order to regulate environmental pollution. Results of environmental monitoring (ambient air, water and noise) conceded out at different locations in study area are compared with PEQS values and are conversed in later chapter of the report.	These standards are applicable in compliance with all the Punjab Environmental Quality standards of different Environmental Parameters during Construction and operational phase.
14	The Punjab Flood Plain Regulation Act, 2016	This act regulates construction in the flood plains in the Punjab. According to this act, no construction can be carried out in flood plains without prior approval in writing from canal officer.	Construction work will be carried out in underground for installing of water supply lines and sewerage lines.
15	Punjab Restriction on Employment of Children Act, 2016	According to the sub-section 11(a) of this act, an occupier who employs or permits a child (person under the age of 15 years) to work in an establishment shall be liable to punishment with imprisonment for a term which may extend to six months, but which shall not be less than seven days, and a mandatory fine between 10,000	The relevance of this act to the project will be to prohibit child employment for construction of the proposed project



Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Brief Coverage	Relevance to project
16	Punjab Protection of Women against Violence Act, 2016	This act counters gender-based discrimination, violence against women, and economic and social empowerment of women. This act will entail if gender-based violence observed in the project area during construction phase.	This Act will be applicable to the project if women are employed for the construction of the proposed Project or women living in near vicinity of the project area.
17	Punjab Tehsil / Town municipal Administration (Works) rules, 2003 (amendments, 2016)	According to Chapter VIII-A Occupational Safety & Hazard Clause 50 A Workplace Safety and clause 50 B pertains to responsibilities of the Local Government Engineer related to health and safety.	All the mentioned clauses will be applicable on construction labor/workers/ and sewer men/sanitary workers during execution of subprojects.
18	Punjab Environmental Protection Act 1997 (Amended 2022)	Post the adoption of the 18th Constitutional Amendment in 2011, the subject of environment was devolved and the provinces have been empowered for environmental protection and conservation. The Punjab Environmental Protection Act, 1997 (as Amended up to 2022) is comprehensive legislation and provides the legislative framework for protection, conservation, rehabilitation and improvement of the environment. The „environment“ has been defined in the Act as: (a) air, water and land; (b) all layers of the atmosphere; (c) all organic and inorganic matter and living organisms; (d) the ecosystem and ecological relationships; (e) buildings, structures, roads, facilities and works; (f) all social and economic conditions affecting community life; and (g) the interrelationships between any of the factors specified in sub-clauses „a“ to „f“.	All projects to be implemented in Punjab must comply with PEQS during all the phases i.e., construction and operation. No Objection Certificate (NOC) shall be required from Punjab Environmental Protection Agency (PEPA) before commencement of construction.
19	Punjab Policy on Controlling Smog, 2017	The Punjab Environmental Protection Department issued this policy on controlling smog in 2017 It imposed a complete ban on open burning of rice stubble, solid waste and other hazardous materials. It focuses the reasons behind the formation of dense smog in the Punjab, especially in Lahore and its environs, on the onset of winters each year and provide a short and medium to long term plan, including measure for protection of school going children; minimizing road accidents and creating mass awareness on precautionary measures for citizens at large.	During construction and operational phases all PEQS will be followed in accordance with to compliance and to minimize pollution load to control smog.

Sr. No.	Strategies / Policies / Legislations / Acts / Laws & Regulations	Relevance to project
20	Punjab Labor Policy, 2018  Through this Labor Policy, the Government resolves to demonstrate its commitment to work for the protection of labor and ensuring its dignity through coordinated efforts and policy integration. The Punjab Labor Policy, 2018 also intends to guide and support the Government and the stakeholders in developing strategies, plans and programs for the protection and promotion of the rights and benefits of working community without jeopardizing the genuine concerns of the employers.	The labor policy will be relevant as it will deal with the protection of labor.
21	Punjab Growth Strategy 2018  The document endorses Punjab's health sector vision and strategy, which emphasizes improvement of water, sanitation and hygiene services to prevent communicable diseases.	This strategy will be adopted in design of proposed project.
22	Punjab Occupational Safety and Health Act, 2019  This law was enacted to ensure occupational safety and health of the persons at workplace. It aims at protection of workers against risks arising out of the occupational hazards and to promote safe and healthy working environment catering to the physiological and psychological needs of the employees at workplace.	This act will be applicable to the proposed project in term of the health and safety during the construction and operational phases of the project.
23	Punjab Water Act 2019  An Act to comprehensively manage and regulate water resources in the Punjab in the interest of conservation and sustainability. It is expedient to provide for comprehensive management of all water resources in the Punjab and to regulate their use in the interest of conservation and sustainability and matters connected with and ancillary thereto.	This act will be applicable to the proposed project. The drinking water supply will be designed in light of PWA, 2019.
24	Punjab Local Government Act 2022  It is expedient to reconstitute the local governments and consolidate laws relating to powers and functions of local governments for establishing an effective elected local government system for meaningful devolution of political, administrative and financial responsibility and authority to the directly elected representatives of the local governments as envisaged under Article 140A of the Constitution to promote good governance, effective delivery of services and transparent decision making through institutionalized participation of the people at local level; and to deal with ancillary matters.	All project activities to be implemented must comply with Punjab Local Government Act during all the phases i.e., construction and operation.



## 2.4 Applicable World Bank Policies

### 2.4.1 World Bank Operational Policies

Safeguard Policies	Triggered	Explanation
Environmental Assessment (OP 4.01)	Yes	Under this OP, the World Bank requires environmental assessment (EA) of projects proposed for Bank's financing to help ensure that they are environmentally sound and sustainable and thus to improve decision making through appropriate analysis of actions and of their likely environmental impacts
Natural Habitats (OP/BP 4.04)	No	This OP is not triggered.
Physical Cultural Resource OP/4.11	No	The sub-project does not lie in any near any cultural and heritage resource therefore OP 4.11 will not be triggered. The possible discovery of archaeological sites or random findings during the excavation and earthworks may occur. In such case, this OP will trigger.
Involuntary Resettlement OP/4.12	No	OP 4.12 is not triggered as the sub-project does not require any land acquisition, therefore there will be no involuntary resettlement, livelihood impacts, or restrictions to access. Consequently, there is no need of a Resettlement Action Plan.
Forests (OP/BP 4.36)	No	The sub-project area does not fall under forest area and will not affect any forest. So, this OP is not triggered.
Access to information (BP 17.50)	Yes	The World Bank's Policy on Disclosure of Information is to be open about its activities and to welcome and seek out opportunities to explain its work to the widest possible audience. The Bank has broadened the scope of information about its activities that it makes publicly available. The Bank has established the Info-Shop at headquarters, plus regional Public Information Centers (PICs), to serve individuals seeking to obtain Bank information. In addition, Country Offices are encouraged to establish modest PIC services for their country clientele. This policy is triggered for sub-projects categorized as A and B. The developer consults project affected groups and local NGOs: a) during scoping and before TORs are prepared; b) when the draft EA is available; and c) throughout project implementation as necessary. The developer provides relevant information in a timely manner prior to consultation and in a form and language accessible to the groups being consulted.
Projects on International Waterways (OP 7.50)	Yes	This policy will be triggered. The Project has got the PAD cleared from Legal department. An exemption for notification has been approved by the SAR VP.

Although the latest Environmental and Social Framework replaces several Operational Policies (OPs) and Bank Procedures (BPs), however, OPs and BPs will be referred in the current safeguard studies for guidance. The World Bank operational policies applicable to the project and its compliance mechanism, are summarized in the description below



## **2.5 Managing the Risks of Adverse Impacts on Communities from Temporary Project Induced Labor Influx**

This guidance note provides guidance on identifying, assessing and managing the risks of adverse social and environmental impacts that are associated with the temporary influx of labor resulting from Bank supported projects. The guidance note contains guiding principles and recommendations to be considered as part of the design and implementation of projects with civil works that require labor from outside the project's area of influence.

## **2.6 Environmental, Health & Safety Guidelines**

In addition to operational policies (OP), the WBG has also established its EHS guidelines for all the interventions that are financed by the group. These EHS Guidelines are technical reference documents with general and sector-specific examples of Good International Industry Practice (GIIP). Following EHS guidelines are relevant to the proposed project during the construction and operation phase:

***EHS Guidelines for Water & Sanitation (2007):*** Issues associated water and sanitation are presented in the EHS Guidelines for Water and Sanitation (2007).

***EHS Guidelines for Construction Materials Extraction:*** Issues associated with sourcing of construction materials are presented in the EHS Guidelines for Construction Materials Extraction.

## **2.7 International Protocol/Conventions**

As Pakistan is a member of a number of international organizations such as United Nations Organization (UNO), Organization of the Islamic Conference (OIC), South Asian Association for Regional Cooperation (SAARC), Economic Cooperation Organization (ECO) etc., so it has to follow the international protocols and obligations related to the environment. The major protocols, ratification dates by Pakistan and obligations related to the proposed project are provided in the **Table 5** below.



**Table 5: International Agreements/Conventions Relevant to the Project**

Sr. No	Agreement/ Convention	Ratification	Description/Relevance
1.	UNESCO Convention on the Protection of the World's Cultural and Natural Heritage, 1972  Web Link: <a href="http://whc.unesco.org/en/%20convention%20text/">http://whc.unesco.org/en/%20convention%20text/</a>	Pakistan ratified this convention on 23 July 1976.	Convention concerning the Protection of the World Cultural and Natural Heritage - requires parties to adopt a general policy on the protection of the natural and cultural heritage, to set up services for such protection, to develop scientific and technical studies, to take appropriate legal, technical, scientific and administrative measures and to foster training and education for such protection. The proposed project design and ESS team paid due attention to archaeological sites and local norms. Both of these factors will also be considered during project implementation.
2.	Convention on Conservation of Migratory Species of Wild Animals, 1979  <a href="https://www.cms.int/">https://www.cms.int/</a>	Pakistan signed this convention in 1981 and ratified it in December 1987.	Convention on the Conservation of Migratory Species deals with the conservation and protection of the migratory species. Species covered in the Convention should be given special attention during EA and monitoring and any impacts identified should be mitigated to acceptable levels.
3.	The Rio Declaration, 1992  Web Link: <a href="http://www.unesco.org/education/pdf/RIO_E.PDF">http://www.unesco.org/education/pdf/RIO_E.PDF</a>	Pakistan signed the treaty on 13 Jun 1992 and ratified on 1 June 1994	The Rio Declaration comprises 27 principles which address important issues such as; sustainable development to integrate environmental protection into the development process; common but differentiated responsibilities to conserve, protect and restore the earth's ecosystems; public participation and information access at the national level, reduce and eliminate unsustainable patterns of production and consumption.
4.	Convention on Biological Diversity, 1994 Web Link: <a href="https://www.cbd.int/">https://www.cbd.int/</a>	Pakistan signed this treaty in 1992 and it was ratified by cabinet in 1994.	The Convention on the Biological Diversity (CBD) has three main goals: Conservation of biological diversity (or biodiversity); sustainable use of its components; and fair and equitable sharing of benefits arising from genetic resources.



## **2.8 Institution Responsible for Planning, Policies and Regulations**

The institutional setting in Punjab has traditionally comprised various agencies at federal, provincial and LG levels with separate land areas, separate legal and administrative frameworks, and engaging in little institutional coordination.

### **2.8.1 Environmental Protection Agency, Punjab**

Implementation of Punjab Environmental Protection Act 1997 (Amended 2012, 2017 & 2022) is the mandate of the Punjab-EPA. Punjab-EPA is headed by a Director General, and sections are headed by Directors, i.e., Director Technical, Director Administration and Finance, and Director Laboratory. Punjab-EPA has established District Environment Offices at district level. As the proposed Project falls in 16 different Tehsil of Punjab, therefore, Punjab-EPA will be responsible for reviewing the report, issuing environmental approval and overall monitoring of the proposed project activities.



## PROJECT DESCRIPTION

Punjab Rural Sustainable Water Supply and Sanitation Project (PRSWSSP) in target area of 2000 villages in 16 tehsils of Punjab with the proposed assistance of the World Bank. To implement this project, Executive Committee of National Economic Council (ECNEC) has authorized Punjab Rural Municipal Services Company (PRMSC) to initially implement this project in 200 villages as pilot phase (Annex-1) to understand feasibility and sustainability of the Project. PRMSC has divided the 16 tehsils into 6 zones depending of geographical location and hired the services of 6 Engineering Design and Supervisory Consultants (EDCS) for the proposed project. In order to fast track the project implementation and execution of the civil works company with the help of consultant selected 26 priority villages out of 200 pilot villages.

These twenty-six (26) priority villages have been selected by consultants from 8 different tehsils for provision of Water Sanitation and Hygiene (WASH) facilities. The subproject involves provision of water supply, sewerage, overhead tanks & Pumping stations with sewage treatment plants in all twenty-six villages.

### 3.1 Need and Purpose of Project

The villages in the project area are facing grave issues related to water supply and sewerage. The underlying issues related to water supply and sewerage in the target villages are summarized below:

#### **Water Supply Issues:**

- No water supply Network in the villages;
- Most of the Household use shallow groundwater;
- Shallow ground water is not fit for drinking;
- Polluted drinking water is causing water borne diseases.

#### **Sewerage Issues:**

- Sewerage system does not exist in priority villages;
- Existing open drains are damaged and collect sewage only from some houses;
- No proper Disposal Point in all the villages;
- Sewage collected in soakage pits and open plots seeps into ground and contaminates groundwater;
- Raw sewage ponds are a breeding ground for diseases.

#### **Solid waste Issues:**

- There is no proper solid waste management system and designated dumping sites in the project area, locals usually throw their waste into open plots or streets.
- There are heaps of waste which attract rodents, flies and disease vectors.
- Organic waste is usually burnt by the villagers, which causes health issues.
- Open drains are used as a garbage/solid waste disposal point thus resulting in decrease of water carrying capacity of these drains.



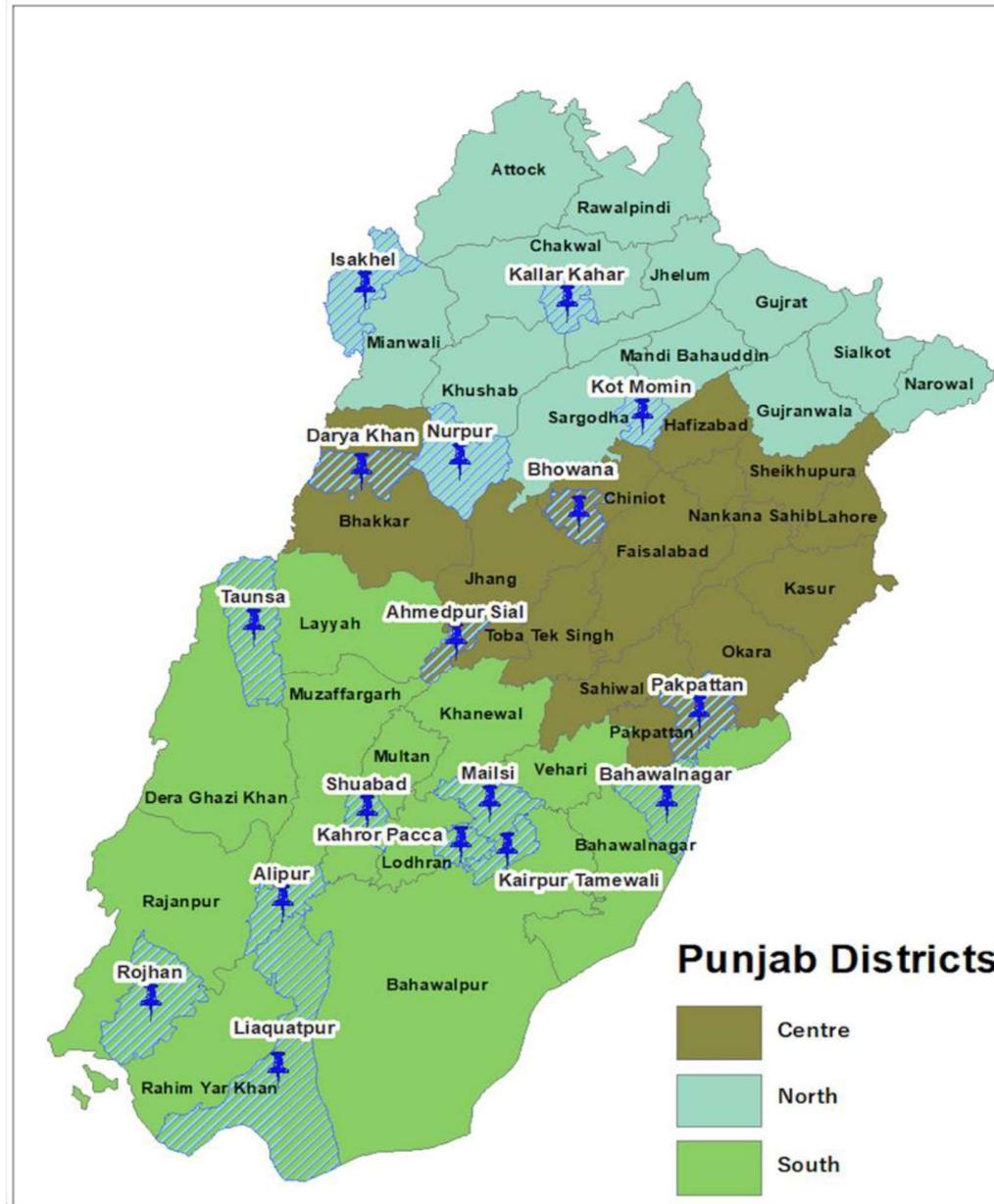
- During rain, storm water and sewage overflow from the drains and spread solid waste through the area thus causing nuisance, environmental issues and spread of diseases.

### 3.2 Project Location

**Table 6** indicating the Cluster, District and tehsils of priority villages to understand the geographical location of the project, for further assistance of project location a map of relevant tehsils is shown in the figure

**Table 6: Location and Name of Priority Villages in Different Tehsils**

Cluster	District	Tehsils	Priority Villages
Center-I	Pakpattan	Pakpattan	Arifabad
			Dhaku Chishti
			Sochan
Center-II	Chiniot	Bhawana	Chak 190
			Chak 192
			Chak 199
			Chak 221
			Chak 226
North	Chakwal	Kallar kahar	Makhyal
	Sargodha	Kot Momin	Gahi
South-I	Bahawalnagar	Bahawalnagar	Naseerpur Khurd
	Bhawalnagar	Khairpur Tamewali	Chak M Zaman
			Chak Sadiq Nagar
			Sheikh Wahan
South-II	Lodhran	Kahrora Pacca	ISA
			Choki Rangu Khan
			Chowki Soba Khan
			Dhora Mahar
			Gulhar
South-III	Rahim Yar Khan	Liaquatpur	Muhammad Pur
			Chak 5
			Chak 17
			Chak 25
			Chak 26
			Chak 29
Chak 30			



**Figure 1: Location Map of Project Area**

### 3.3 Objectives of Project

The project development objective is to provide equitable and sustainable access to safely managed water and sanitation and reduce child stunting.



### 3.4 Project Description

#### Existing System

The existing water and sewerage situation of the village is given below and Pictorial view is given in **Plate 3.1**.

#### A. Existing Water Supply System

There is no existing/functional water supply system in any of the priority villages hence no water supply network exists here. At present, domestic boreholes are the main water source for the village which is available at a depth of around 50-75 ft. Deeper tube wells at depth of around 150 ft are also bored which are used for irrigation purposes. Most of the people brings drinking water from deep borehole near the village or from nearby villages if their village have brackish groundwater (i.e Bahawalnagar, Bhawana and Liaquatpur), Where the sweet water is available people collect water from deep borehole within their villages. Whereas, according to villagers the drinking water is unhygienic which results to major waterborne diseases like hepatitis, cholera and diarrhea in the village.

#### B. Existing Sewerage System

There is no existing sewerage pipe network or disposal station in the villages. The sewerage system is totally based on open drains of varying sizes and capacities. The sewage is first collected in house collection chamber (soakage pits), which is then carried through existing open channels, drains and ultimately dispose of into nearest sewage pond and fields. Some of this sewage is also used to irrigate nearby crops/farmlands through water courses.

In villages sewage pond exists which is used as a main sewage recipient. Most of the drains dispose of into this pond and rest of the drains after collecting sewage from the adjacent areas disposed of into nearest fields haphazardly.

#### C. Existing Solid Waste

Solid waste management system and designated dumping sites are not available in the project area. The waste is usually dumped in the streets, agricultural fields or open plots. The heaps of waste cause nuisance and the situation gets worse during rainy season. The organic waste is burnt to meet the fuel demands in the kitchens. Glimpses of existing conditions are shown in **Plate 3.1**.



**Principal Settlement Chak 226**



**Pakhra Sultan Disty near Chak 190**



**View of existing drain along soling**



**Open Drain with Solid Waste Accumulation along the sides**



**Soakage Pits**



**Drain conveying water to Pond**



**Sewage Pond**



**Pumping of Wastewater for Irrigation Purposes**



**Glimpse of Solid waste issue**



**Glimpse of Solid waste issue**



**Principal Settlement of Chak 192**



**Demarcation of Existing System in Principal Settlement**



**Pictorial View of 3R Disty**



**Lined Water course for Irrigation Purposes**



**Sewage in unlined water course for Irrigation purposes**



**Drinking Water Source for Chak 192**



**Open Drain with Solid Waste Accumulation**





**Sewage Pond of Principal Settlement**



**Sewage Pond of Minor Settlement**



**Main Canal Jhang Branch near Chak No. 199**



**Nullah No.1 Disty near Chak No. 199**



**Water Course Conveying Water to Fields**



**Demarcation of Govt Land near Veterinary Hospital**



Centralized Drinking Water Source



Demarcation of Existing Drains

### Plate 1: Glimpses of Existing site Conditions

#### 3.4.1.1 Proposed System

##### A. Water Supply System

The design considerations for water supply system of this area are given below:

- Per Capita Demand = 15 gpcd
- Peak Factor = 2.25 of Average water Demand
- Terminal Pressure Head = 15 psi

After calculating the size of water storage tanks, water supply system has been designed in a loop fashion. First, the route of main loop and then secondary is finalized. Feeding/contributing areas were marked followed by water demand for each pipe is calculated based on the feeding/ serving area of the pipe, population density and per capita water demand. The water demand of the pipe is primarily based on feeding area. Afterwards, each feeding area is multiplied with respective population density resulting in the served population on that pipe. Overhead Water tanks are proposed in villages.



## **B. Sewerage System**

The sewerage system of these villages has been designed so that the final disposal of collected sewage should be in the proposed pumping station. This pumping station will pump sewage into Anaerobic Baffled Reactor (ABR). After treatment, treated effluent complying with PEQS, would be discharged into existing nearby sewerage pond or community owned water courses. The sewerage systems have been designed for design year of 2050. The sewage generation was calculated based on the projected population for design year 2050 which was then multiplied by per capita demand, the sewage is taken as 80% of that flow.

## **C. Sewage Pumping Station**

The pumping station consists of following structures:

- i) One screen chamber (Two partitions)
- ii) One Wet well (Two partitions)
- iii) One Dry well
- iv) One valve chamber

Total 3 no. pumps (2 working + 1 standby) are proposed in dry well. The sewage will be treated in ABR from where this treated effluent will be disposed into existing water course.

## **D. Sewage Treatment Plant**

The proposed STPs shall receive sewage from the proposed pumping station. The STP is designed for planning horizon of year 2050. Treated effluent from the proposed STP will be discharged into nearby water course from where it will be reused in agriculture fields. In case, at any time throughout the year, the treated effluent will not be required by the farmers, then as bypass arrangement, the treated effluent can be discharged in to existing village pond which will receive only storm water after implementation of sanitation facilities under this project.



### 3.5 Environmental & Social Considerations (E&S) in Project Design

Environmental and social (E&S) aspects have been given due considerations in the project design to make the project sustainable, environmentally friendly and socially acceptable. E&S considerations in project design are summarized below:

- The depth of sewer lines has been kept low in waterlogged villages of Liaquatpur; to avoid groundwater contamination of shallow aquifer. Same practices will be applicable for similar conditions.
- Sewers shall be laid at least 1m away from water supply lines (except for few street in each village, where the street width is less than 2 meters.
- In all cases, the sewer lines shall be laid below water pipeline (the difference between top of the sewer and bottom of water pipeline shall be at least 300 mm);
- Designed manhole covers to withstand anticipated loads & ensure that the covers can be readily replaced if broken to minimize silt/ garbage entry;
- Ensured sufficient hydraulic capacity to accommodate peak flows & adequate slope in gravity mains to ensure self-cleansing velocity in order to prevent built up of solids and hydrogen sulfide generation;
- All structural, layout and engineering designing are in strict accordance with the applicable codes and engineering standard;
- The location of overhead water tanks, pumping station and STP have been finalized in close consultation with local community and representatives of local authorities;
- Tree cutting has been avoided;
- Efficient seepage control measures have been considered in selection of pipe materials during the planning stage;
- Effluent generated during construction phase will be treated through septic tanks.
- Alignments of sewerage and water supply lines have been carefully selected to minimize disturbance to public utilities;
- Relocation of the public utilities, if any, shall be planned and approved in consultation with relevant departments/authorities/stakeholders before project commencement to avoid inconvenience to the public;

### 3.6 Project Cost

The estimated total cost for construction of proposed 26 priority villages is **3562.56** million PKR. This cost is tentative and will be finalized with the detailed technical design of the proposed project.

### 3.7 Land Acquisition

The laying of piping network for water supply and sewerage network will not require land acquisition, as the pipeline will be buried underground. However, if pipe will be laid under the private premises special permission for laying and time to time maintenance shall be sought. The land required for the construction of overhead tank, pumping station and STP will be



acquired through Voluntarily Land Donation (VLD) or state land will be acquired through process of NOC. Village wise breakup of land requirements given in **Table 7**.

As it is obvious from the table, state land is mostly available in villages called “Chak”. During British Raj, new canals were built to bring the barani areas under cultivation by introducing the irrigated areas around the core of new villages as Chak number. As these Chaks were planed during British Raj, and sufficient state land is available therefore NOC process was adopted. Where as in other villages government land is not available hence the land will be acquired through VLD procedure.

**Table 7: Land Requirement Details**

Sr. No	Tehsil	Revenue Villages	Private Land required through VLD (In Marla)	State land required through NOC (In Marla)
1	Pakpattan	Dahku Chishti	30	
			30	
		Arifabad	40	
		Sochan	30	
			40	
2	Kalar Kahar	Makhial	115	
		Gahi	74	
3	Kot Momin	Naseerpur Khurd	30	
4	Bahawalnagar	Chak Muhammad Zaman	22	
		Moza Sadiq Nagar	15	10
5	Khairpur Tamiwali	Sheikh Wahan	80	
		Moza Isa	25	
6	Kahror Pakka	Muhammad Pur	7	
		Chowki Rangu Khan	9	5
		Gulhaar	13	
		Dora Mahar	3	
		Chowki Suba Khan	10	47
7	Bhawana	Chak No. 190		130
		Chak No. 192		133
		Chak No. 199		167
		Chak No. 221		156
		Chak No. 226		160
8	Liaquatpur	Chak No. 5/A		70
		Chak No. 17/A		44
		Chak No. 25/A		248
		Chak No. 26/A		76
		Chak No. 29/A		232
		Chak No. 30/A		220
Total			511	1598



Note: The total 511 Marla land required for construction of infrastructures in Tehsils Pakpattan, Kalar Kahar, Kot Momin, Bhawalanager, Khairpur Tamilwali will be acquired through VLD process, whereas majority of 1598 Marla land will in Tehsils Bhowana, Liaqatpur and Kehror Paka will be acquired through State Land NOC process.

### 3.8 Project Administrative Jurisdiction

The proposed project falls under the jurisdiction of Deputy Commissioners of relevant tehsils of province.

### 3.9 Project Implementation Schedule

The project will take 10 months in each village from start to finish. The commencement is scheduled simultaneously in June 2023.

### 3.10 Construction Activities and Required Machinery

Construction activities involve following:

- Earth work
- Structure/ Concrete works
- Pipe laying

**Table 8** presents the list of expected machinery required for construction. The number of these machines will be finalized with the detailed design of the proposed road:

**Table 8: List of expected Machinery/Equipment**

1	Mobile Crane	15	Jack Hammer
2	Dumpers	16	Plate Compactor
3	Road/Power Roller	17	Wood Shuttering
4	Light Weight Compactor	18	Formwork
5	Ramming Machine	19	Steel Cage Shuttering Unit
6	Water Sprinkler and Water Tanker	20	Motor graders
7	Excavator	21	Generators
8	Tractor with Front Blade and Trolley	22	Welding Plant
9	Loader	23	Transit Mixer
10	Road Cutter	24	Vibrators
11	Pneumatic Tyred Roller (PTR)	25	Scaffolding
12	Tandem Roller	26	Light Transport
13	Concrete Mixer Machine	27	Mini/ Hand Roller
14	Tower Crane	28	Barricades

### 3.11 Construction Camps

Camp sites will be selected based on following considerations:



- Number of workforces deployed;
- Type and quantity of machinery mobilized;
- Availability of adequate area for establishing camp sites including parking areas for machinery, stores and workshops;
- There must be provision of material storage yards within the camps' boundary;
- Access to communication and local markets;
- Appropriate distance from sensitive areas including settlements and religious and/or cultural facilities.

Final locations will be selected by the contractor with the assistance of Supervision Consultant. It is proposed that only one construction camp should be established in tehsils where villages are geographically located in close proximity, this will result in resource efficiency and better monitoring of construction activities. Care will be taken to safeguard the existing environment of the area and location shall be selected away from settlements. The contractors may acquire land on lease basis from private landowners. The contractors will return the land on as received basis, all debris, construction materials, left over chemicals and machineries shall be removed before the handing over the premises to landowners.

### **3.12 Construction Materials**

The materials used in construction of water supply, sewerage, overhead tanks pumping station & sewage treatment plant (STP) in all villages, would include coarse aggregates (crush), bricks, fine aggregates (sand), soil, water, pipes (RCC & HDPE), cement, reinforcement, asphalt etc.

### **3.13 Workforce Requirement**

Manpower demand estimation is an essential component to facilitate deployment of manpower.

#### **Workforce during Construction Phase**

Total man power required on site for proposed Project will be approximately 15-30 workers per village per day, depending on the type of construction. They will be inside of the area of possession, under the supervision of a Contractor who will be awarded the contract.

#### **Workforce during Operation Phase**

Total man power required during operation phase for proposed Project will be approximately 5 workers per village comprising skilled and unskilled staff.

### **3.14 Solid Waste Generation**



Due to construction activities waste will be generated at construction and contractors camp site. The construction waste will include wastewater, oil spillage from machinery, domestic waste and waste construction materials. Solid waste generated during construction and camp sites will be safely disposed of in demarcated waste disposal sites.

### **Construction and Operation Phase**

The solid waste generation is estimated to be 0.28kg/capita/day during construction phase of the proposed Project.

### **3.15 Water requirement**

#### **Construction Phase**

The water consumption is estimated to be 30 liter/day/worker<sup>3</sup> during construction phase of the proposed Project.

#### **Operation Phase**

The water consumption is estimated to be 30 liter/capita/day (during operation phase of the proposed project).

### **3.16 Wastewater Generation during Construction Phase**

The wastewater generation is estimated to be 24 liter/capita/day<sup>4</sup> for during construction phase of the proposed Project. Temporary toilets with cesspit will be adequately installed and treated periodically, and after the completion of work, the ground will be restored.

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<sup>3</sup> The most basic water requirement is stipulated by the World Health Organization (WHO) and varies between 20 and 50 litres per capita per day (LPCD).

<sup>4</sup> Design Criteria of Public Health Engineering for Water Supply, Sewerage and Storm Water Drain (Domestic sewage generation = 80% of water consumed/day)



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## Baseline Profile

### 4.1 General

This chapter presents the current environment around the proposed development which has been considered with respect to physical, ecological and socio-economic resources. An environmental baseline study is intended to establish a database against which potential project impacts can be predicted and managed later. The ESMP of the proposed project covers a comprehensive description of the project area, including the resources which are expected to be affected by the project, as well as, those which are not expected to be directly affected by the construction and operation of the project. The prevailing environmental conditions around the proposed project have been considered with respect to physical, biological and socio-economic aspects.

ESMP teams conducted the reconnaissance and detailed surveys of the project area for baseline data collection during field visits from December, 2022 to January, 2023. The prime objective of the field visits was to collect the baseline data on physical, eco-biological and environmental & social aspects along with identification, assessment and categorization of the significant environmental and social impacts of the proposed Project. The secondary data was collected from published sources/reports and relevant departments, which were also verified through visual observations during reconnaissance and detailed surveys.

### 4.2 Purpose of the Baseline Study

An environmental baseline study is intended to identify and establish all the physical, biological and social environmental conditions, prevailing earlier the execution of the project, in order to use this information as a reference datum to associate future changes and judge them if the conditions have changed for better or worse. As such, it must include all resources, which can reasonably be affected by the project. The baseline description is intended to accomplish the following objectives:

- A.**
- **To deliver proponent of the project with adequate knowledge about socio-economic set-up, physical environment aspects, social aspects, ecological features, built-up structures and infrastructure of the project area; and**
  - **To allow the planners to assess the potential efficacy of the actions to alleviate the adverse impacts and improve benefits.**

### 4.3 Delineation of Study Area/ Area of Influence (Aoi)

As per the environmental screening study conducted earlier, the project falls in "Category E2" which means that the impacts of the project activities are limited and within the boundary of project area. Therefore, the whole village has been considered Area of Influence (Aoi).



As per the national and provincial regulations along with the requirements of World Bank's OP's, impacts and risks have been analyzed within the project Aol. Environmental and social impacts and risks will also be analyzed for all relevant stages of the project cycle, including pre-construction, construction and operation phases of the project.

#### 4.4 Physical Environment

The physical environment includes topography, geology, soil, climate, hydrology, drainage, seismology, surface water, groundwater and ambient air.

##### 4.4.1 Topography

The proposed project sites are rural settlements comprising residential and agriculture areas. The topography of the project area in south and center is predominantly flat. Whereas, Kallar Kahar in North cluster mainly comprises of mountains and hills. Ground elevation increases from South towards North. The ground elevations variation is given in **Table 9**:

**Table 9: Topographic Variations**

Sr. No.	Cluster	Tehsils	Elevation (ft)
1	South-I	Bahawalnagar	350 – 387
2		Bahawalpur	335 – 385
3	South-II	Karor pacca	335 – 387
4	South-III	Liaquatpur	387 – 420
5	Central-I	Bahwana	544 - 593
6	Central-II	Pakpattan	487 – 593
7	North	Kot Momin	563 – 610
8		Kallar Kahar	1920 – 2368

##### 4.4.2 Geology

Punjab's area mostly consists of an alluvial plain formed by the southward-flowing Indus River and its four major tributaries. The general slope of the land is from northeast to southwest, but it rises in the areas between rivers. Approximately 70 percent land area of the province comprises flood plains of Indus basin. Geologically, lands in the flood plains are lightly mantled with alluvial deposits transported from the Himalaya foothills. The underlying bedrock is composed of Precambrian metamorphic and tertiary consolidated rocks. The overlying alluvium consists of Pleistocene to recent unconsolidated deposits of sand, clay and silt. The formation age of the alluvium also dates from Pleistocene to recent, the latter being predominant earth river banks and the former around the central part of the plains, no major fault zone traverses the project area.

Tehsil Kallar Kahar is only hilly area of project. The Salt Range is one of the most important geological and historical landmarks of Pakistan. The geology of Kallar Kahar area is mainly richly fossiliferous stratified rocks. These rocks also provide an excellent opportunity for appreciation of tectonics in the field.



#### 4.4.3 Climate and Meteorology

##### i. Average Temperatures

The project area has hot summer and cold winters.. The summer starts from May and lasts till September. June is the hottest month. The mean maximum varies between 37- 41 °C and minimum temperature varies between 24-29 °C respectively for month of June. The winter seasons lasts from November to February. January is the coldest month. The mean maximum ranges between 16 - 21 °C and mean minimum temperature are and 3 - 7 °C in January as shown in the table below: Heat waves and heat stroke.

**Table 10: Temperature Variation in Summer and Winter Season**

Sr. No.	Cluster	Tehsils	Average Annual Rainfall (mm)	Summer Season		Winter Season	
				Mean Max °C	Mean Min °C	Mean Max °C	Mean Min °C
1	South-I	Bahawalnagar	45	41	29	20	7
2		Bahawalpur	143	41	28	20	7
3	South-II	Kahrora	81	41	29	20	7
4	South-III	Liaquatpur	101	46	29	23	5
5	Central-I	Bahwana	135	45	29	21	5
6	Central-II	Pakpattan	95	41	29	20	8
7	North	Kot Momin	188	40	27	19	6
8		Kallar Kahar	206	37	24	16	3

In project areas most of the times of year sunny days dominate. A few days per month are partly cloudy and with seldom overcast days. The maximum participation days are observed during June to August.<sup>5</sup> In project areas are classified as arid region having average annual rainfall less than 250 mm. Highest intensity of rain is recorded in month of June, July and August owing to monsoon season.

##### ii. Wind

In targeted tehsils windier part of the year is April to August. In south and center zone of the Punjab has June as windiest month. Whereas, in North April is windiest month. In South Punjab dust storms are common from June to August.

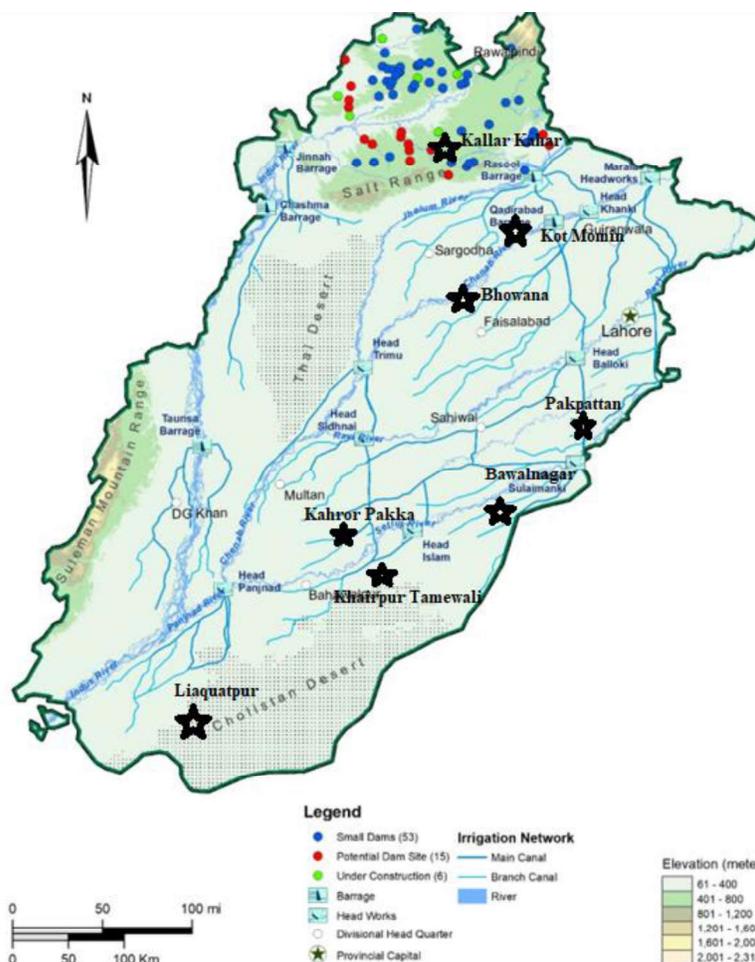
<sup>5</sup> [https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/chiniot\\_pakistan\\_1181096](https://www.meteoblue.com/en/weather/historyclimate/climatemodelled/chiniot_pakistan_1181096)

**Table 11: Average Wind Speed and Windiest Month in Tehsils**

Sr. No.	Cluster	Tehsils	Windiest Month	Avg Wind Speed
1	South-I	Bahawalnagar	June	13.6 Km/hr
2		Khairpur Tamianwali	June	15.7 Km/hr
3	South-II	Karor pacca	June	15.3 Km/hr
4	South-III	Liaquatpur	June	16.2 Km/hr
5	Central-I	Bahwana	June	10.2 Km/hr
6	Central-II	Pakpattan	June	12.4 Km/hr
7	North	Kot Momin	April	9.6 Km/hr
8		Kallar Kahar	April	9.4 Km/hr

#### 4.4.4 Water Resources

Description of surface water and groundwater of targeted villages in different tehsils is as under. Hydrology map of Punjab Province is shown in **Figure 2**.



Source: The Urban Unit on Irrigation department of Punjab Statistics.

**Figure 2: Hydrology Map of Punjab Province**



## A. Surface water

Punjab is land of Indus River and its four major tributaries in Pakistan, the Jhelum, Chenab, Ravi, and Sutlej rivers. Punjab Irrigation system is one of the world's largest irrigation systems with a command area of over 21 million acres. The system consists of 24 main canals and 12 barrages and vast network of canals, distributaries and minors spanning over 40,000 kilometers. Targeted villages in north, south and center of the Punjab are in command of this irrigation system except for villages in Kallar Kahar, there is no canal or distributary passing nearby. The detail of canal and distributaries passing within or nearby the targeted villages is shared in **table 12**:

**Table 12: Surface Water Bodies in Targeted Villages of Relevant Tehsils**

Sr. No.	Cluster	Tehsils	Surface Water Bodies of targeted villages in Tehsils			
			Main Canal	Branch Canal	Distributary	Minor Canal
1	South-I	Bahawalnagar	Fordwah	Hakara		
2		Khairpur Tamianwali	Bahawal Canal		Qayamwah, Baagh Ali	
3	South-II	Karor pacca	Chit	Lohdran	Basant, Gopal	
4	South-III	Liaquatpur		Abbasia	1R, 2R, 3R	
5	Central-I	Bahwana		Jhang Branch	Nille No.1 Mochiwala Sultan Pakhra	Arbi Minor
6	Central-II	Pakpattan	Pakpattan			Pakpattan
7	North	Kot Momin	Lower Jhelum	N/A	Kot Momin	N/A
8		Kallar Kahar	N/A	N/A	N/A	N/A

## B. Groundwater/Drinking Water Quality

The findings of the groundwater investigation indicate that the project area has a plentiful supply of groundwater available at depths ranging from 30 to 60 feet, with the exception of the villages of Liatatpur and Kallar Kahar. Liatatpur is characterized by water-logged conditions, while Kallar Kahar is a hilly area where groundwater is situated at depths exceeding 300 feet.

The groundwater analysis of the targeted villages in different tehsils revealed the following facts in **table 13**:

**Table 13: Groundwater Analysis**

Sr. No.	Cluster	Tehsils	Groundwater Detail of targeted villages in Tehsils				
			Depth	Taste	Color	Source	Remarks
1	South-I	Bahawalnagar	30-40 ft	Brackish	Clear	Seepage of Canal Water	High fluoride
2		Khairpur Tamianwali	40-50 ft	Non-Objectionable	Clear	Groundwater	
3	South-II	Karor Pacca	50-60 ft	Non-Objectionable	Clear	Groundwater	Microbial contamination
4	South-III	Liaquatpur	<5ft	Brackish	Clear	Seepage of	High TDS and



						Canal water	Hardness, Microbiological contamination
5	Central-I	Bahwana	30 – 40 ft	Non- Objectionable	Yellowish	Groundwater	High turbidity
6	Central-II	Pakpattan	50 – 60 ft	Non- Objectionable	Clear	Groundwater	-
7	North	Kot Momin	30 – 40 ft	Non- Objectionable	Clear	Groundwater	-
8		Kallar Kahar	300 – 350 ft	Non- Objectionable	Clear	Groundwater	Microbiological contamination

The data presented in the table suggests that in project areas where the groundwater is brackish, seepage from the canal water will serve as the primary source of water for the water supply system. Conversely, in areas where the groundwater is deemed acceptable in terms of taste, it will be utilized as a source of water following appropriate treatment measures.

#### 4.4.5 Environmental Monitoring, Sampling and Testing

In order to determine the ambient air, noise levels, groundwater/ drinking water quality, environmental monitoring was carried out through EPA approved environmental labs in the project area. The sampling locations for the environmental monitoring of ambient air, noise and groundwater/ drinking water and wastewater for the relevant tehsils lies within the boundary of the selected villages. To analyze the quality of groundwater and surface water, monitoring was performed for all the villages.

#### A. Ambient Air Quality

The ambient air quality monitoring period was 24 hours. The results of ambient air quality monitoring are given in **Table 14**.

**Table 14: Ambient Air Quality Results**

Sr. No	Parameters	Unit	Location								PEQS
			South-I Bawalnagar Chak M. Zaman	South-I Khaipur T. Sheikh Wahan	South-I Kahrur Pakka Gulhar	South-II Liaquatpur Chak-17	South-III Bohwana Chak 225	Central-I Bahwana	Central-II Pakpattan Daku Chisti	Central-III Kot Momin Naseerpur Khurd	
1	Carbon monoxide	mg/m <sup>3</sup> (8 Hour)	0.79	0.87	1.25	1.79	1.175	1.466	1.29	1.26	5
2	Sulphur dioxide	µg/m <sup>3</sup>	22.56	20.36	25.27	35.98	16.66	24.98	25.4	26.54	120
3	Ozone	µg/m <sup>3</sup> (1 Hour)	-	-	-	102	68.1	-	88	97	130
4	Nitric oxide	µg/m <sup>3</sup>	14.98	16.94	10.89	2.75	0.473	4.12	2.42	2.42	40
5	Nitrogen Dioxide	µg/m <sup>3</sup>	25.78	42.54	8.97	17.99	5.971	12.32	19.4	18.1	80



6	PM <sub>(2.5)</sub>	µg/m <sup>3</sup>	23.53	24.51	28.97	50.2	147.6	67.97	50.4	53.1	35
7	PM <sub>(10)</sub>	µg/m <sup>3</sup>	85.23	74.56	99.82	148.1	239.6	148.6	147.8	145.5	150
8	Suspended particulate Matter	µg/m <sup>3</sup>	130	123.6	156.8	396.2	458.6	325.8	389.5	388.2	500

The ambient air quality monitoring is carried out via mobile air quality laboratories that are stationed at the sides of roads. As a result, areas with heavy traffic may exhibit higher concentrations of particulate matter and gases emanating from vehicular exhausts. The central and northern regions of Punjab are comparatively more industrialized than the southern region, which leads to a greater prevalence of anthropogenic sources of air pollution. This disparity is also reflected in the results of the air quality monitoring, where PM<sub>2.5</sub> and PM<sub>10</sub> levels that are near the prescribed limits of the Punjab Environmental Quality Standards (PEQS) are highlighted in yellow in the table. If the levels of particulate matter exceed the prescribed limit set by PEQS, they are highlighted in red in the table

### B. Noise Level

Noise levels were monitored with the help of a portable digital sound meter at the project area for 24 (twenty-four) hours. The results of noise monitoring are given in **Table 15**.

**Table 15: Noise Monitoring Results**

Zone	Tehsils	Priority Villages	Equivalent Noise Level (Leq) dB(A)		PEQS Limit dB(A)	
			Day Time	Night Time	Day Time	Night Time
Central-I	Pakpattan	Arifabad	56.7	45.2	75	65
Central-II	Bahwana	Chak 192	60.7	52.7		
		Chak 226	61.9	51.1		
North	Kallar kahar	Makhyal	53.9	49.2		
		Gahi	54.2	50.6		
	Kot Momin	Naseerpur Khurd	54	50		
South-I	Bahawalnagar	Chak M Zaman	54.5	42.4		
		Chak Sadiq Nagar	53.1	39.0		
	Khairpur Tamewali	Sheikh Wahan	55.7	41		
		ISA	54.0	42		
South-II	Kahrro Pacca	Gulhar	61.9	51.1		
		Chak 17	54.9	50.1		
South-III	Liaquatpur	Chak 29	53.2	49.4		

The results of the noise monitoring conducted indicate that none of the readings obtained from any of the villages exceeded the prescribed noise limits as set forth by the Punjab Environmental Quality Standards

### C. Wastewater Quality

Wastewater samples were collected and was analyzed. The analysis results of wastewater samples are compared with PEQS. The detailed monitored results for wastewater quality are given in **Table 16**.



**Plate 1: Sampling of wastewater**

**Table 16: Results of Wastewater**

Sr. No	Parameters	Unit	Location								PEQS
			South-I Bawalnagar Chak Sadia	South-I KPT Sheikh Wahan	South-I Kahrar Pakka Gulhar	South-II Liaquatpur Chak-25	Central-I Bohwana Chak 190	Central-II Pakpattan Sochan	North Kot Momin Naseerpur Khurd	North Kallar Kahrar Gahi	
1	pH		7.58	7.68	7.73	7.27	8.41	7.62	7.08	7.80	6-9
2	Chemical Oxygen Demand	mg/L	157	167	168	208	144	184	208	232	150
3	Biochemical Oxygen Demand	mg/L	83	98	88	108	88	114	128	148	80
4	Total Suspended Solid (TSS)	mg/L	72	135	245	165	160	75	170	180	200
5	Oil & Grease	mg/L	0.0	2.5	0.0	7.8	0.0	0.0	0.0	0.0	10

The collected samples of wastewater are not representative, as they are spot samples taken from open drains and channels. However, the analysis of the wastewater samples indicates that the levels of biological oxygen demand (BOD), chemical oxygen demand (COD), and total suspended solids (TSS) fall within the typical range of sewerage. It should be noted that the BOD and COD levels are higher than the limits established in the Punjab Environmental Quality Standards (PEQS). To meet the PEQS requirements, a potential solution is to utilize

an Anaerobic Baffled Reactor (ABR) for wastewater treatment, which can readily ensure compliance with these standards.

#### 4.4.6 Seismology

C. All tehsils of the project area are located in a low Hazard earthquake zone (Zone 2A) except Kallar Kahar (Zone 2B). Figure 4.19 shows the seismic zoning map of Pakistan.

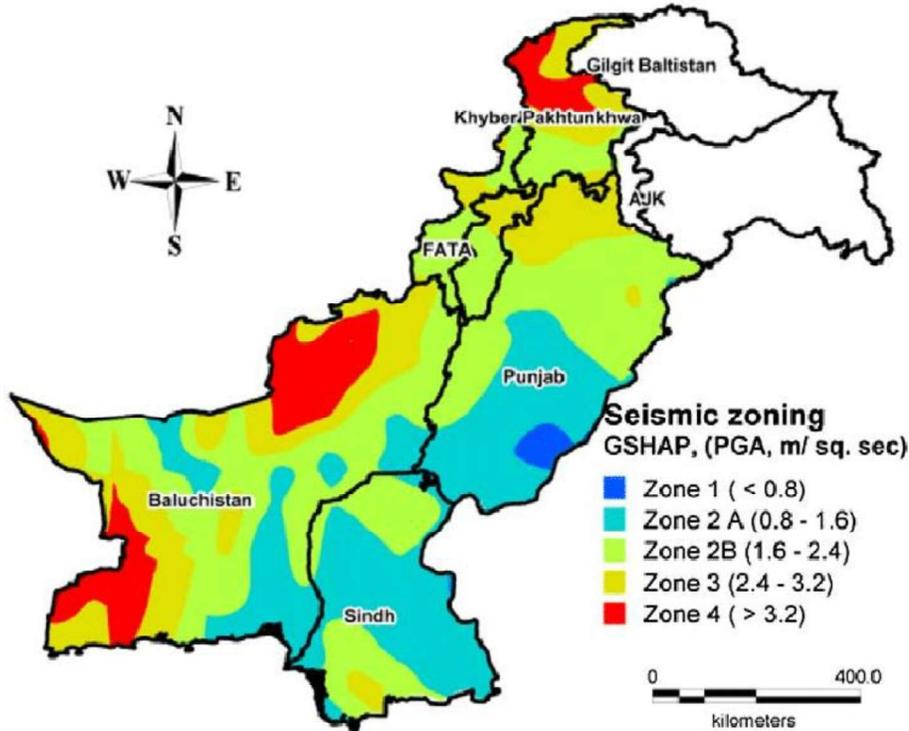


Figure 3: Seismic Zone Map of Project Area



#### 4.5 Sensitive Receptors

Village wise sensitive receptors are identified in the table 17 below:

**Table 17: Sensitive Receptors**

Zone	Tehsils	Priority Villages	Sensitive Receptors					
			Hospital/ BHU	School	Worship Places	Grave-yards/ Shrine	Others	
Center-I	Pakpattan	Arifabad	0	2	1	1		
		Dhaku Chishti	1	1	1	0		
		Sochan	0	1	1	0		
Center-II	Bhawana	Chak 190	-	2	1	-		
		Chak 192	-	2	3	-		
		Chak 199	0	2	1	-	NGO/ CBO	
		Chak 221	1	3	2	-		
		Chak 226	-	2	2	-		
		Makhyal	-	2	4	4		
North	Kallar kahar	Gahi	-	2	2	3		
		Naseerpur Khurd	-	2	1	1		
		Chak M Zaman	-	3	1	-		
South-I	Bahawalnagar	Chak Sadiq Nagar	1	5	8	2		
		Sheikh Wahan	2	6	3	3		
		ISA	-	2	1	1		
South-II	Kahrur Pacca	Choki Rangu Khan	-	2	3	-		
		Chowki Soba Khan	-	2	3	1		
		Dhora Mahar	-	-	3	-		
		Gulhar	-	2	1	1		
		Muhammad Pur	-	1	3	-		
South-III	Liaquatpur	Chak 5	-	2	2	3		
		Chak 17	1	1	1	-		
		Chak 25	-	4	3	3		
		Chak 26	-	2	1	1		
		Chak 29	-	3	7	-		
		Chak 30	-	3	2	2		
Total		26						

Note: The socially sensitive receptors listed in the table above, such as Pakpattan, Bhawana, Kallar Kahar, Kot Momin and Kehrur Pakka, are within a radius of 100 meters of the execution of work, whereas Bhawalnagar and Khairpur Tamewali sensitive receptors are discussed in relation to the area of influence (AoI) of concerned revenue village



## 4.6 Biological Environment

Project area is rich in biodiversity because of its diverse landscape and geographical location. The variety of ecosystem is evident and is home to various species. The following section describes the biological environment of the project area.

### 4.6.1 Flora

The major floral species found in the project area include the following:

Zone	Tehsils	Floral Species
Central-I	Pakpattan	Sumbal ( <i>Bombax ceiba</i> ), Shesham ( <i>Dalbergia sissoo</i> ), Eucalyptus ( <i>Eucalyptus globulus</i> ), Kikar ( <i>Acacia karoo</i> ), Peepal ( <i>Ficus religiosa</i> ), Neem ( <i>Azadirachta indica</i> ) and Poplar ( <i>Populus</i> ), Mulberries ( <i>Morus rubra</i> ), Beri ( <i>Ziziphus mauritiana</i> ), Peaches ( <i>Prunus persica</i> ) Guava ( <i>Psidium guajava</i> ), Sweet Lime ( <i>Citrus Limetta</i> ), Lime ( <i>Citrus limon</i> ), Date Palm ( <i>Phoenix dactylifera</i> ) and Jaman ( <i>Syzygium cumini</i> ), <i>Stenotaphrum</i> , <i>Cyperus rotundus</i> and <i>Phalaris Minor</i>
Central-II	Bahwana	Jand trees ( <i>Prosopis spicigera</i> ), Karir ( <i>Capparisaphylla</i> ), Beri ( <i>Zizyphus jajaba</i> ), Van ( <i>Salvadora abeoides</i> ), Kikar ( <i>Acacia arbica</i> ), Shisham ( <i>Dalbergia</i> ), Aak ( <i>Calotropis hamiltonii</i> ), Kikar ( <i>Acacia nilotica</i> ), Eucalyptus ( <i>Eucalyptus camaldulensis</i> ), Jaman ( <i>Syzygium cumini</i> ), Sirris ( <i>Albizia lebbek</i> ), Neem ( <i>Azadiraccta indica</i> ), Popular ( <i>Salicaceae</i> ), Toot/Mulbery/Pilken ( <i>Morus alba</i> ), Beeri Patta ( <i>Heterophragma adenophyllum</i> ), Willow ( <i>Salix babylonica</i> ), Frash ( <i>Tamarix aphylla</i> ), Simal ( <i>Bombax cieba</i> ) Palm/Khajoor
North	Kallar Kahar	<i>Zizyphus mauritiana</i> , <i>Morus nigra</i> <i>Eucalyptus citriodora</i> . Khabbal ( <i>Cynodon dactylon</i> ) <i>Conyza bonariensis</i> <i>Brachiaria ramosa</i> <i>Cannabis sativa</i> , <i>Parthenium hysterophorus</i> , <i>Malvastrum coromandelianum</i> , <i>Datura innoxia</i> , <i>Oxalis corniculata</i> , <i>Amaranthus viridis</i> <i>Aerva javanica</i> <i>Chrysopogon serrulatus</i> , <i>Apluda mutica</i> <i>Heteropogon contortus</i> <i>Justicia adhatoda</i> , <i>Dodonaea viscosa</i> , <i>Asparagus gracilis</i> , <i>Opuntia dillenii</i>
	Kot Momin	the van ( <i>Salvadora abeoides</i> ), Kari ( <i>Salsola foetida</i> ), jand ( <i>Prosopis spicigera</i> ) and malla ( <i>Zizyphus nummularia</i> ), Kikar ( <i>Acacia arabica</i> ) and Thali ( <i>Dalbergia sissoo</i> ), Uksh or Kash or Fareash ( <i>Tamarix articulata</i> ), Bair ( <i>Zizyphus Mauritiana</i> ), Tahli or Sheesham ( <i>Dalbergia Sissoo</i> ), Van ( <i>Salvadora Oleoides</i> )
South-I	Bahawalnagar	The Van ( <i>Salvadora oleoides</i> ), Karil ( <i>Capparis aphylla</i> ), Jand ( <i>Prosopis spicigera</i> ), Beri ( <i>Zizyphus jajaba</i> ), mallha ( <i>Zizyphus nummularia</i> ) and Shisham ( <i>Dalbergia Sissoo</i> )
	Khairpur Tamewali	Kikar ( <i>Acacia Nilotica</i> ), Frash ( <i>Tamasix Aphylla</i> ), Pillu ( <i>Salvadora Oleoides</i> ), Jand ( <i>Prosopis Spicigera</i> ), Kareer (main diet of Houbara Bustard), Phog, Khar,
South-II	Kahrora	The Van ( <i>Salvadora oleoides</i> ), Karil ( <i>Capparis aphylla</i> ), Jand ( <i>Prosopis spicigera</i> ), Beri ( <i>Zizyphus jajaba</i> ), Kikar ( <i>Acacia Nilotica</i> ), Frash ( <i>Tamasix Aphylla</i> ), Pillu ( <i>Salvadora Oleoides</i> ),
South-III	Liaquatpur	<i>Calligonum polygonoides</i> , <i>Alhagi camelorum</i> , <i>Acacia jacquemontii</i> , <i>Prosopis spicigera</i> , <i>Pennisetum dichotomum</i> , <i>Leptadenia spartium</i> , <i>Capparis decidua</i> , <i>Haloxylon polygonoides</i> , <i>Dalbergia sissoo</i> , <i>Acacia nilotica</i> , <i>Eucalyptus camaldulensis</i> , <i>Prosopis glandulosa</i> , <i>Saccharum bengalense</i> , <i>Imperata cylindrical</i> , <i>Conyza ambigua</i> , <i>Aeluropus lagopoides</i> , <i>Cymbopogon jwarancusa</i>



#### 4.6.2 Fauna

The faunal species found in the project area and its vicinity include the following:

##### A. Mammals

Common animals found in the project area include dogs, cats, house rats and bats. Domestic livestock observed during field visits include buffaloes, cattle, goats, sheep, and donkeys that are used by the local residents for their livelihood.

##### B. Amphibians

Bullfrog (*Hoplobatrachus tigernius*), Pahari tidda maindak (*Fejervarya limnocharis*) and Indus valley toad (*Bufo stomaticus*) are also present in the nearby ponds and canals during rainy season.

##### C. Birds

House sparrow (*Passer domesticus*), House crow (*Corvus splendens*) and Mynah (*Acredotheres tristis*) are the most common sight in the area. In addition, following birds are also seen in the project area.

Common Name	Scientific Name
Nightingale	<i>Pycnontus cafer</i>
Parrot	<i>Psittacula krameri</i>
Pigeon	<i>Columba livia</i>
Hoopoe	<i>Upupa epops</i>
Koel	<i>Eudynamys scolopacea</i>
Black kite	<i>Mivus migrains</i>

##### D. Reptiles

Common tree lizard (*Calotes versicolor*), Monitor lizard (*Varnus bengalensis*), fat tailed lizard (*Uromastix hardwickii*) and fringed toed lizard (*Acanthodactylus cantoris*) are observed in and around the proposed site. Indian soft-shell turtle (*Aspideretes gangeticus*) and Indian falpshell (*Lisseyms punctate andersoni*) are also reported by the local residents.

#### 4.6.3 Endangered Species

There are no endangered species of flora and fauna observed in the Study Area.



#### 4.6.4 Wetlands

There are no wetlands in the project area.

#### 4.6.5 Wildlife Sanctuaries and Game Reserves

No wildlife sanctuary or game reserve is located in the vicinity of the project area except Kallar Kahar is notified as a Game Reserve under section 18 of the Punjab Wildlife (Protection, Preservation, Conservation and Management) Act, 1974, vide Notification No. SOP (WL) 1222/2001, dated 13-02-2002, w.e.f 31-05-2006 till further orders.

### 4.7 Socioeconomic Profile

#### 4.7.1 Socio-Economic Baseline Structure

This sub-section provides a socioeconomic assessment pertaining to the demographic and socio-economic conditions of the proposed project area. Detailed site visits were conducted by Social Experts to assess the prevailing socioeconomic conditions and to assess the socioeconomic impacts of the proposed project. During the field surveys, interviews and consultation meetings were held with the local representatives i.e., Numberdars, residents (Males & Females), shopkeepers, land owners, agriculturists, and their laborers, etc., in all twenty six priority villages of project area.

#### 4.7.2 Secondary Data Results

#### A. Population Composition and Demographic Characteristics

Cluster	Tehsila	Villages	Number of H.Hold	Male	Femle	All sexes
North	kallar Kahar	Gahi	587	1690	1561	3,251
		Makhyal	544	1552	1,433	2,985
	Kot Momin	Naseerpur khrud	226	761	703	1,464
Center	Bhawana	Chak.190	229	888	819	1,707
		Chak.192	193	715	660	1,375
		Chak.199	740	2187	2,018	4,205
		Chak.221	629	1682	1,553	3,235
		Chak.226	480	1562	1,441	3,003
	Pakpattan	Arifabad	279	893	824	1,717
		Dhaku Chihшти	658	2152	1,987	4,139
		Sochan	579	2078	1,919	3,997
South	Bahawalnagar	Chak.Zaman	196	643	594	1,237
		Chak. Sadiqnagar	1567	4430	4,089	8,519



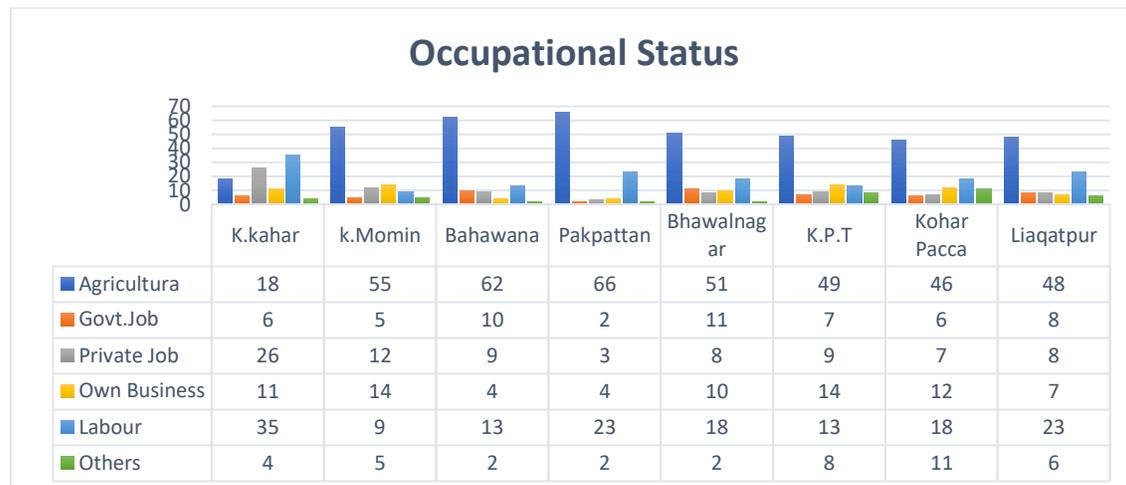
	K.P.T	Moza ISA	127	461	425	886
		Shekh Whan	1391	4769	4,402	9,171
	Kehror Pcca	Choki Rangu khan	732	2119	1,956	4,075
		Gulhar	183	661	611	1,272
		Mohammdpur	143	561	518	1,079
		Choki Sooba khan	262	855	789	1,644
		Dora Mahr	48	147	135	282
		Liaqatpur	Chak.5	235	840	775
	Chak 17	242	901	831	1,732	
	Chak 25	391	1494	1,379	2,873	
	Chak 26	282	939	866	1,805	
	Chak 29	442	1344	1,241	2,585	
	Chak 30	323	1109	1,023	2,132	

**Table 18: Secondary data results of Project Area**

### 4.7.3 Findings of Socioeconomic Survey

#### Occupational Status of the Respondents

Based on occupational data, agriculture appears to be the primary occupation in the project area. In all tehsils of the project area, the majority of individuals identified as landowners. A significant percentage worked as laborers, while the third most common occupation was owning a business. The trend of Government and private jobs was also observed in the project area. However, a small percentage of respondents identified with other professions. **Figure 4** presents percentages of the various occupations of the respondents.



**Figure 4: Occupational Status of the Respondents**



## **A. Religion**

Islam is the dominant religion in Punjab province and particularly in project area. The overall percentage of muslim community in project area is around 98.5%. However, the Christian are relatively having small percentage like 1.75% present in all tehsils of project area. Similarly in south cluster teshils of project area like Liaqatpur, Bhawalnagar and Khairpur Tamiwali have around 2% of Hinduism according to censuses of 2017. The survey area is predominantly made up of Muslim-community and there were also found other religion like Christianity was reported by the respondents.

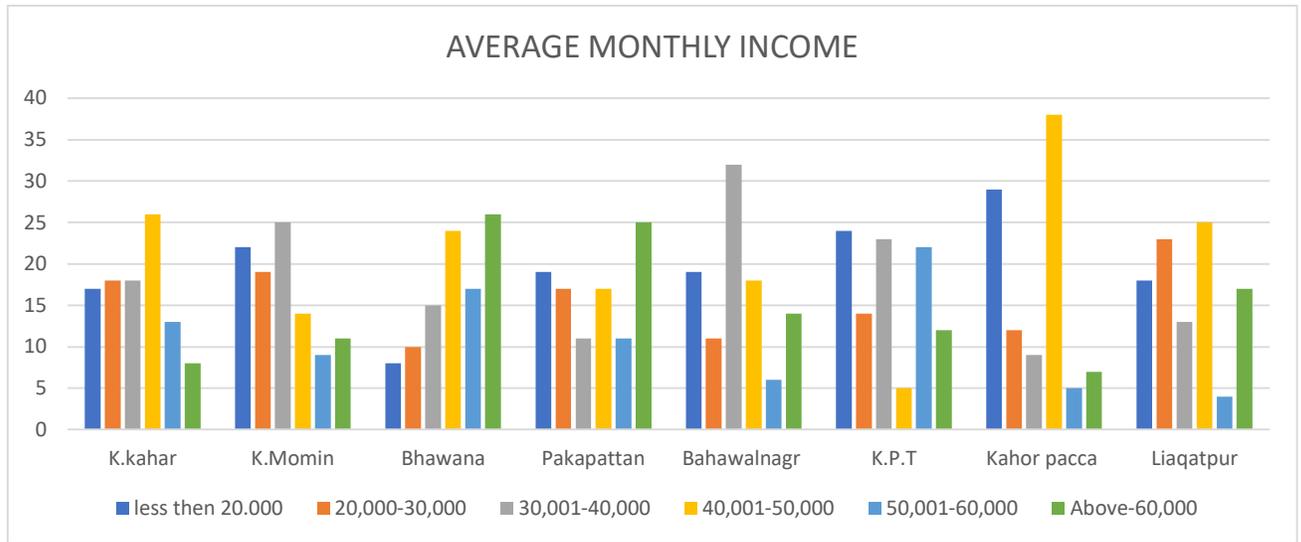
## **B. Caste System**

Several casts/clans have been reported in the project area. Rajpoot, Jutt, Pathan, Awan, Chishti, Bodla, and Arain are among the dominant castes found in the project area Tehsils Bhowana, Pakpattan, Bhawalnager, Kot Momin and Kalar Kahar. Other castes included Syed, Baloch, and Kanju found in Tehsil Liaqatpur, Kehror Pakka, and Khairpur Tamiwali. Most of the project area is spoken and understood in Punjabi, however Saraiki is the second most common language in the south tehils Liaqatpur, Khairpur Tamiwali, and Kehror Pakka of project area.

## **C. Monthly Income of the Respondents**

The monthly income earned by individuals from various sources varies widely ranging from less than Rs. 20,000 to above Rs. 60,000. Mostly individuals reported struggling to make ends meet and have hand-to-mouth existence as their income barely covers their basis household expenses.

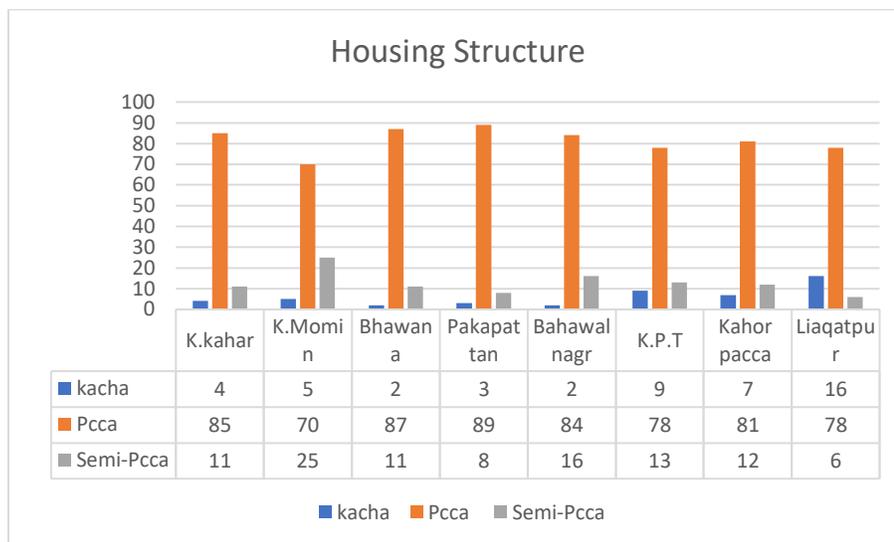
In general, the agriculturists and landlords are wealthy with incomes that often exceed Rs. 60,000 per month. However, laborers are financially vulnerable with limited income and resource to support their families. According to the consultation held in Tehsil Kalar Kahar (Gahi) and shows that 15% is living under the poverty line and earning less than 23,000/ppp. As for as South (Tehsil Kehror Pakka) is concerned more target population (28%) is living under poverty line. Percentage of the average monthly income of the respondents is shown in **Figure 5**.



**Figure 5: Monthly Income of the Respondents**

#### D. Housing Construction Pattern

Though the proposed project areas lack of basic amenities were observed during the consultations. However, with the passage of time, the people have built pacca homes i.e., RCC roof, stone walls with cement mortar, cement plastering & flooring. However, a few semi-pacca houses and kacha houses were reported in South Punjab (Kehror Pakka and Liaqatpur tehsils) nature of construction of houses is shown in **Figure 6**.



**Figure 6: Nature of Construction of House**



## **E. Mode of Transport**

Public transport facilities are not sufficiently present in the south and North area and people use their personal motorbikes, cycles, and cars, etc. for traveling. However, in Center, people also use Rickshaws. In case of emergencies, they call Rescue 1122 and get aid in 5-10 minutes of time.

## **F. Communications**

The means of communication are very limited in the project area. The telephone connections for internet services are present in project area, however, mobile phone coverage is also present and people have access to the internet as well through mobile phones. The access roads to all the project sites are in good condition though the situation of internal streets and roads is still poor. The village roads/ streets are metaled, soling as well as unpaved. Motorways are available in Tehsil Kalar Kahar and Kot Momin. In Tehsil Pakpattan, Bhowana, Kehror Pakka and Liaqatpur Railway network is also available for communication. Highways communication facilities are available in all tehsils of project area.

## **G. Health Facilities**

Poor health conditions in the project area are one of the reasons behind the initiation of the proposed project. The use of brackish water is causing several water borne disease in Tehsil Bhawalnagar. The stunt growth disease is also reported in project area.

The most common diseases in these areas are including typhoid, cholera hepatitis, diarrhea, intestinal worms and malaria.

There are better health facilities available in center (Pakpattan and Bhowana) and North (Kalar Kahar and Kot Momin) but as far as South is concerned very limited better health facilities according to the population other than Basic Health Unit (BHU) are present in south Punjab (Liaqatpur, Kehror Pakka and Khairpur Tamiwali).

## **H. Educational Facilities**

Primary, Middle and High schools are present in the proposed project areas. The list of educational facilities is already being discussed in social sensitive receptors Table-17.

## **I. Basic Civic Amenities in the Project Area**

The proposed project area has lack basic civic amenities including water supply, sewerage system, stormwater drainage, solid waste management, gas supply as well as telephone connections. The only facility available in the proposed project area is electricity which is also inadequate as people suffer long hours of load-shedding and low voltage issues.

## **J. Mechanism of Conflict Resolution**



During the field survey, discussions were held with the local communities about the types of disputes often prevailing in the communities. The mostly disputes at the community level are own the right to vote, marriage settlement, land related issues mostly legal issues and dispute may arise on water distribution. The most commonly used means of handling disputes in the project area is by having meetings (Kath in South areas) among village elders from pre-dominant caste or other respected person unanimously selected by community. It is more commonly used in North and Central Punjab where Hindu or Christian community prevails. The decisions made by the elders are often based on the principles of equity and fairness, and are meant to restore harmony in the community.

The Panchayat system prevails is another traditional mechanism of conflict resolution in central Punjab. The Panchayat system is often used to resolve disputes related to property, marriage, and other social issues.

The overall mechanism of conflict resolution in central, north and south Punjab is a complex system that involves a combination of formal and informal mechanisms. The traditional mechanisms, such as the Jirga and Panchayat systems, play a significant role in resolving conflicts, while the formal mechanisms, such as the police and court system, are available as a last resort.

During the field survey, discussions were held with the local communities about the disputes prevailing in the communities. It was observed that most of the activities are carried out under the instruction of the head of a caste. The mostly disputes at the community level are the right to vote, marriage settlement, and other small matters. The most commonly used means of handling disputes in the project area is by use of clan meetings and discussions headed by a community head. Most of the conflicts in the project area are insignificant, i.e., quarrels among youngsters, which are mutually resolved within the caste at the local level.

#### **K. Presence of NGOs/ CBOs**

There are several NGOs and CBOs present in the project area. According to stakeholder consultations and institutional stakeholder consultations, Punjab Rural Support Programme (PRSP) and National Rural Support Programme (NRSP) are working in Tehsil Liaqatpur, Kehror Pakka, Khairpur Tamiwali, and Bhawalangar areas. The scope of both NGOs is WASH, which is also within the mandate of PRMSC. Similarly, Akhoowat and Kashaf are also working in Tehsil Pakpattan, Bhowana, and Kot Momin, providing microfinance and small scale loan services. Community-Based Organizations (CBOs) were also reported in Tehsil Bhowana and Liaqatpur, working to support marriages, funeral prayers, and other financial needs of the community. CBOs can play an important role in social mobilization, behavior change in target villages, and tariff collection and O&M of the schemes.

#### **4.7.4 Results of Gender Situation Survey**

- A gender situation analysis was conducted in all 26 villages/sub-villages across eight tehsils through focus group discussions. The purpose of this qualitative survey was to



identify women-related concerns, gender roles and responsibilities, education levels, occupational status, involvement in agriculture and livestock, access to health facilities, willingness to pay, access to power and resources, prevalence of gender-based violence, and needs assessment.

- Traditional gender roles and responsibilities in rural Punjab Center, North, and South are almost identical, with women primarily responsible for domestic and caregiving tasks and men serving as the primary breadwinners. Although females are engaged in agricultural and subsistence farming operations and livestock-related activities, they encounter obstacles in controlling resources, accessing land, credit, and other resources, limiting their productivity and economic opportunities in rural settings.
- Waterborne diseases are a significant public health concern for females and children in the surveyed areas, according to focus group discussions.
- Women-headed households are not uncommon in the surveyed areas, especially in South and North where men migrate for work to other cities or abroad.
- The majority of female respondents in South, North, and Center areas are not involved in decision-making processes, with their decisions limited to day-to-day household affairs. Males make major and decisive decisions, while in the center, some respondents reported that decisions were made through mutual consultation and understanding.
- Although there were few reported violent incidents in South, respondents in other areas considered gender-based violence an act of boldness rather than a crime. The consultation found a lack of knowledge about sexual harassment (SH) and sexual exploitation and abuse (SEA) as crimes and how to report them, with social pressure to keep them secret and treat them as a matter of honor.



## PUBLIC CONSULTATION

### 5.1 General

This section describes the outcomes of the public consultation sessions held with different stakeholders that may be directly or indirectly affected by the proposed project. The consultation with community and institutional stakeholders during project planning, designing and implementation stages is a key to sustainable development. Likewise, participation of stakeholders is essential to meet the objectives of meaningful consultation for preparation of ESMP. The adequacy of the public consultation is one of the basic criteria used to determine the project compliance with the national / international safeguard policies.

### 5.2 Objectives and Principles of Consultation

The consultation process provides a forum where information relevant to the project is disseminated to and asked from the stakeholder. This participation is necessary because it paves a pathway between the investor and the public and enables the provision of much needed local knowledge and indigenous know-how which must be integrated into the project design. This not only fosters goodwill and success in the project but also leads to a conflict-free project implementation.

The stakeholders including government representatives, other regulators and the NGOs were met to appraise and discuss the environmental and social perspective of project activities. Their valuable concerns and suggestions were noted and thereafter incorporated in the Environmental and Social Management Plan.

The objectives of the consultation process are to:

- Identify, Inform and involve all stakeholders and local residents including females, minorities and disables, in the consultative and participation process;
- Share information with stakeholders on the construction of the proposed project and expected impacts on the physical, biological and socio-economic environment;
- Understand stakeholders' concerns and perceptions regarding various aspects of the project, including the existing available facilities and the likely impacts of construction and operation related activities of proposed Project; and
- Provide an opportunity to the public to provide valuable suggestions in the project design in a positive manner.

### 5.3 Consultation and Participation Process

To ascertain the perceptions of different stakeholders about the project scope, its implementation, operation and evaluation, consultation meetings were conducted. The consultation process was carried out in accordance with the World Bank Guidelines on public consultation. A series of consultation sessions were carried out with stakeholders (Govt. departments, farmers, teachers, businessman, women's etc.). The meetings were held in the month of December 2022 & January 2023.



The consultant staff preferably chose sites that are easily accessible and barrier-free to accommodate all persons. The consultative sessions/meetings are held mostly at Dera with both men and women separately. The minutes of the meeting from the focus group discussions and community meetings have been noted down by the consultant staff and can be shared with the participants (that chose to share their contact information) and the community. These consultative sessions were designed to exchange information, to discuss the strengths, weaknesses, opportunities, and threats of an idea or project. The consultation meetings proved very useful in information sharing and consensus building.

#### **5.4 Identification of Stakeholders**

Project stakeholders were engaged in the review and discussions on various project aspects, social and environmental issues at the early stage of impact assessments for feedback. There are two categories of stakeholders in the project:

##### **Individual/Community Stakeholders**

Project beneficiaries for instance, Residents of the project area, Shopkeepers, Employees, Customers, Road Users, Vulnerable and Gender.

##### **Institutional Stakeholders**

- PRMSC, Environmental Protection Agency Punjab (EPA), Deputy Commissioner's Office Chiniot, Agriculture Department, Punjab, Tehsil Headquarter Hospital THQ.

#### **5.5 Information Dissemination**

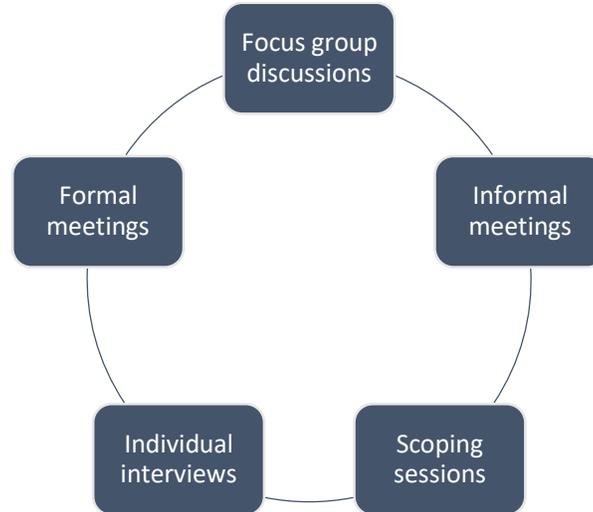
Following information was discussed and disclosed to the stakeholders during the consultation meetings:

- Introduction of the project;
- Description of various project components, their activities and impacts;
- Discuss social and environmental impacts;
- Needs, priorities and reactions of the affected people regarding the proposed projects' impacts; and
- Need of Grievance Redress Mechanism (GRM) in all villages to address the issues & concerns of stakeholders.

For information dissemination to community, culturally appropriate techniques and local language was used.

#### **5.6 Methods of Public Consultation**

Public Consultations were carried out in order to establish stakeholder's opinions regarding project implementation. The following methods were used for public consultation and stakeholder's participation:



## 5.7 Approach Adopted for The Consultation

To hold the meetings, people were informed one day before the meeting to assemble in the villages. In addition, the consultant team contacted the council members and community representatives of each village and informed about the purpose of these consultation meetings. The representatives played a positive role in information dissemination to locals of villages. The meetings held in an encouraging environment where people expressed their concerns and views freely. Formal meetings and interviews were also conducted with female, vulnerable and disabled of the affected community, to explore their needs, problems and priorities related to project execution. In addition to the formal meetings, individual meetings/interviews were also held with the affected females to efficiently involve them in planning process.

## 5.8 Stakeholders Concerns Towards the Project

Concerns raised by the participants, particularly with regard to environmental and social impacts of the project have been listed in following Tables which shows concern and responses as derived from scheme wise consultation meetings.

### 5.9.1 Concerns and Issues

Following **Table 22** shows concerns and responses of public consultation meetings.

**Table 19: Findings of the Consultation Meetings**



Sr. No	Concerns Raised	Locations	Response
1	There is no public water supply and people rely on the conventional methods of water collection i.e. Boreholes etc.	All 26 villages	The objective of the proposed project is to provide clean drinking water to all the residents of the community at their doorsteps through a piped network.
2	There is no sewerage system and the sewage is being disposed of in open lands which create nuisance.	All 26 villages	The sewage will be connected through a piped network and will be disposed of after adequate treatment through a wastewater treatment plant.
3	There is no collection of solid waste and the waste is dumped directly in the open plots and streets which create nuisance	All 26 villages	A comprehensive solid waste collection system will be developed and waste containers shall be placed at appropriate locations in the villages. PRMSC will collect the solid waste through bins and will transport it to the designated disposal site.
4	The residents of the village are ready to pay the bills for the water supply services. But they have some concerns regarding the billing procedure. They want to know does billing based on household consumption, household size or lump sum amount has to be paid.	Kallar Kahar Kot Momin Pakpattan	Water meters are already in the plan as part of the project and will be provided soon to the community. The water meter will be installed at the household level whereas bulk water metering is installed on each network.
5	The construction activities will cause inconvenience to local residents due to hindrance in routine activities	All 26 villages	The contractor will ensure that construction work do not create disturbance for local people's access to the local route and their routine life activities.
6	Noise and dust will be generated from construction activities and may cause health issues.		Regular sprinkling of water will be carried out to control the dust emissions at the construction site, whereas construction activities will be avoided during night time.
7	Recreation facilities such as parks and playgrounds should be provided.	Kahror Pakka Liaquatpur Bhawana	Provision of recreation facilities is not the mandate of the proposed project; however, the concern has been noted and will be reported to the higher authorities.
8	Solid waste produced during construction time is a major concern, should not be piled up in the project area;		The construction and other waste generated at the site shall be collected, stored and transported to the final disposal site by the contractor on daily basis.



Sr. No	Concerns Raised	Locations	Response
9	The water is not drinkable and there are several waterborne diseases in the project area	All 26 villages	Waterborne diseases shall be reduced and there will be an improvement in public health with the provision of clean and healthy drinking water.
10	GST or OHR should be constructed as a part of this project.	Kot Momin, Kalar Kahar	An OHR will be constructed as a part of this sub-project.
11	Will there be tree cutting?	All 26 villages	Efforts will be made to protect as much trees / plants as possible.
12	Will employment opportunities be generated for locals during the construction phase?	All 26 villages	maximum workforce will be employed from the sub-project area.
13	How the land will be acquired? Will there be any compensation for the land.	All 26 villages	Land will be acquired for overhead tank, STP and water treatment and supply. For the purpose state land will be prioritized or public property will be obtained through voluntary land donation
14	People of nearby village asked, if the water supply and sewerage network will be provided to other villages in the vicinity.	Kallar Kahar	Other villages of the vicinity will be included in the next phase of the project.

## 5.9 Consultations with Female Community Members

Following **Table 23** shows concerns and responses of gender consultation meetings.

**Table 20: Findings of the Consultation Meetings**

Sr. No	Concerns Raised	Locations	Response
1	Females shared their serious concern about sewer system as there is no proper sewerage system in community. Drains are open which creates health issues.	All 26 villages	Covered drains are proposed in all selected villages.
2	Women have to go out to the watercourses for washing clothes	Pakpattan, Kot Momin, Khairpur Tamiwali	The issue will be resolved if village is provided with the piped water supply network.
3	Privacy issues were raised by local females of village due to the construction work of labour in the project area.	Kalar Kahar	Labour should be bound to work and stay in the designated area or camp sites. Proper training will be provided to the workers to avoid any gender related issue.
4	Woman show the security concern in moving the villages.	All 26 villages	Security should be ensured so woman could move in the village easily.



Sr. No	Concerns Raised	Locations	Response
5	Most of the colleges are in the town and a great percentage of girls quit the education as it is difficult for them to go for education	Bhowana	Provision of educational facilities is not the mandate of the proposed project; however, the concern has been noted and will be reported to the higher authorities.
6	Poor transportation is one of the concerns highlighted by the woman as it would become difficult for the woman to go to school and college for seeking education well as for job purpose in the nearby town.	Liaquatpur, Kehrur, Pakka, Khairpur, Tamilwari	Provision of transportation facilities is not the mandate of the proposed project; however, the concern has been noted and will be reported to the higher authorities.
7	Women were unsatisfied with the water quality	Kalar Kahar, Bhawalnager, Liaquatpur, Bhowana	Water related issues will be resolved after the implementation of various subprojects under PRMSC
8	Awareness should be raised in the villages regarding water, sanitation and hygiene services	All 26 villages	Local representatives should conduct awareness programs to educate the community regarding water, sanitation and hygiene services.
9	Family parks for women and children should be constructed in the villages.	Kehrur Pakka, Khairpur Tamiwali, Liaquatpur	Provision of recreational facilities is not the mandate of the proposed project.
10	Proper arrangements should be provided for the safe mobility of women in all communities	All 26 villages	Accessibility shall be not blocked completely and alternate passages shall be provided.

### 5.10 Consultation with Institutional Stakeholders

Table 24 shows the concerns of institutional stakeholders.

**Table 21: Concerns of Relevant Government Departments**

Sr. No.	Department	Coverage	Points of Discussion /Apprehensions	Response
1	<b>EPD Chiniot</b>  Mr. Nawaz (District Environmental Officer)		Consultant's team described the project location and proposed activities to District Environmental Officer and inquired about their apprehensions/ suggestions regarding the project; <ul style="list-style-type: none"> <li>In conducting ESMP, Scoping sessions and Individual interviews should be conducted with all stakeholders.</li> <li>Social issues regarding private land acquisition, were discussed in detail.</li> </ul>	All the suggestions shall be incorporated. Institutional consultations are already underway and efforts shall be made to take all the stakeholders on board.



Sr. No.	Department	Coverage	Points of Discussion /Apprehensions	Response
			<ul style="list-style-type: none"> <li>• Baseline should be developed separately according to the baseline conditions of Chiniot.</li> <li>• Public Hearings must be done so that stakeholders who have different types of stakes along with their apprehensions can be listed down easily.</li> </ul>	
2	<b>Agriculture Department</b>	Bhowana	<p>The consultant's team described the project location and proposed activities to Deputy Director and A.D Bhowana and inquired about their apprehensions/ suggestions regarding the project;</p> <ul style="list-style-type: none"> <li>• Deputy Director tells about the major crops are Sugarcane and Rice cultivated in the project area. The wastewater should not be used for agriculture purposes without treatment</li> </ul>	Sewerage treatment plant is the part of proposed project. PRMSC will ensure that wastewater will be used for irrigation (if needed) after adequate treatment through a sewage treatment plant
3	<b>Livestock Department</b>	Pakpattan	<p>The consultant's team described the project location and proposed activities to Artificial Inseminations Technician and inquired about their apprehensions/ suggestions regarding the project;</p> <ul style="list-style-type: none"> <li>• Waterborne disease and viral disease in animals were discussed</li> </ul>	The proposed project will provide clean drinking water to all the residents of the selected villages and the provision of water for portable use include water for the animal's activities. Waterborne diseases in animals will be resolved after the implementation of this project.
4	<b>Tehsil Headquarter Hospital THQ</b>	Bhowana	<p>Consultant's team described the project location and proposed activities to MS Hospital and inquired about their apprehensions/ suggestions regarding the project;</p> <ul style="list-style-type: none"> <li>• Show some serious concern regarding water borne diseases.</li> <li>• Every third person in Tehsil Bhawana suffering from Hepatitis.</li> <li>• Due to lack of infrastructure and transportation facilities in villages, it become difficult for the patient to reach the THQ.</li> </ul>	The objective of the proposed project is to provide clean drinking water to all the residents of the selected villages at their doorsteps through a piped network. Waterborne diseases will be resolved after the



Sr. No.	Department	Coverage	Points of Discussion /Apprehensions	Response
				implementation of this project.
5	<b>Municipal Committee</b>	Liaquatpur	<p>The consultant's team described the project location and proposed activities Tehsil Manager and Assistant Manager and inquired about their apprehensions/ suggestions regarding the project;</p> <ul style="list-style-type: none"> <li>• Discussion on field planning and effective approach to adequately cover all the field aspects and collect requisite data.</li> </ul> <p>The possible constraints in data acquisition were discussed and an effective way out was decided.</p>	Discussed the scope and main features of the project.
6	<b>Agriculture Department</b>	Lahore, Punjab	<p>The consultant's team described the project location and proposed activities Field officer and inquired about their apprehensions/ suggestions regarding the project;</p> <ul style="list-style-type: none"> <li>• Field officer talked about the major crops are Wheat and cotton cultivated in the project area.</li> <li>• The wastewater should not be used for agriculture purposes without treatment</li> <li>• Treated water is used for irrigation purposes</li> </ul> <p>Only individual-level solar tube well is present</p>	PRMSC will ensure that wastewater will be used for irrigation (if needed) after adequate treatment.
7	<b>Punjab Irrigation Department</b>	Lahore, Punjab	<p>The consultant's team described the project location and proposed activities to Executive Engineer and inquired about their apprehensions/ suggestions regarding the project;</p> <ul style="list-style-type: none"> <li>• The wastewater should not be used for agriculture purposes without treatment</li> <li>• Treated water is used for irrigation purposes</li> </ul> <p>Treated waste should be dispose in canals.</p>	PRMSC will ensure that wastewater will be used for irrigation (if needed) after adequate treatment. No wastewater is going to be disposed in the any canal/ nearby water body.
8	<b>Tehsil Headquarter Hospital THQ</b>	Kahror Pakka	<p>Consultant's team described the project location and proposed activities to MS Hospital and Deputy Director Livestock and inquired about their apprehensions/ suggestions regarding the project;</p> <ul style="list-style-type: none"> <li>• Show some serious concern regarding water borne diseases.</li> <li>• Every third person in Tehsil suffering from Hepatitis.</li> </ul>	The objective of the proposed project is to provide clean drinking water to all the residents of the selected villages at their doorsteps through a piped network.



Sr. No.	Department	Coverage	Points of Discussion /Apprehensions	Response
			Due to lack of infrastructure and transportation facilities in villages, it become difficult for the patient to reach the THQ.	Waterborne diseases will be resolved after the implementation of this project.
9	<b>Livestock Department</b>	Sahiwal	The consultant's team described the project location and proposed activities Deputy Director Livestock and inquired about their apprehensions/ suggestions regarding the project; Waterborne disease and viral disease in animals were discussed	The proposed project will provide clean drinking water to all the residents of the selected villages and the provision of water for portable use include water for the animal's activities. Waterborne diseases in animals will be resolved after the implementation of this project.
10	<b>Environment Protection Department</b>	Liaquatpur	Consultant's team described the project location and proposed activities to Assistant Director District Office and inquired about their apprehensions/ suggestions regarding the project; <ul style="list-style-type: none"> <li>• In conducting ESMP, Scoping sessions and Individual interviews should be conducted with all stakeholders.</li> <li>• Social issues regarding private land acquisition, were discussed in detail.</li> <li>• Baseline should be developed separately according to the baseline conditions of Liaquatpur</li> </ul> Public Hearings must be done so that stakeholders who have different types of stakes along with their apprehensions can be listed down easily.	All the suggestions shall be incorporated. Institutional consultations are already underway and efforts shall be made to take all the stakeholders on board.
11	<b>Department of Fisheries</b>	Pakpattan	The consultant's team described the project location and proposed activities Field officer and inquired about their apprehensions/ suggestions regarding the project; Deputy Director District Office tells about the breed of fishes in that area.	No wastewater is going to be disposed in the any nearby water body. So, no aquatic life is going to be affect by this project.
12	<b>Department of Forest</b>	Rahim Yar Khan	The consultant's team described the project location and proposed activities DFO and inquired about	There is no forest in the project boundary or near the project



Sr. No.	Department	Coverage	Points of Discussion /Apprehensions	Response
			their apprehensions/ suggestions regarding the project; • Show their concerns about the forest in Rahim Yar Khan	boundary that is going to be affect.
13	<b>Public Health Engineering Department</b>	Punjab	The Client team described the project location and objectives, as PHED is also working in the same domain it was requested to share their work plan for the relevant tehsils with PRMSC to avoid duplication of services or infrastructure. Moreover PHED share their lesson learned to improve the service delivery.	Lesson learned will be considered in project planning and designing phase to improve service delivery.

### 5.11 Consultation with NGO

We totally understand that it is important to take NGOs/CBOs on board. According to stakeholder consultations and institutional stakeholder consultations, Punjab Rural Support Programme (PRSP) and National Rural Support Programme (NRSP) are working in Tehsil Liaquatpur, Kehror Pakka, Khairpur Tamiwali, and Bhawalangar areas. The scope of both NGOs is WASH, which is also within the mandate of PRMSC. Similarly, Akhoowat and Kashaf are also working in Tehsil Pakpattan, Bhowana, and Kot Momin, providing microfinance and small scale loan services. Community-Based Organizations (CBOs) were also reported in Tehsil Bhowana and Liaquatpur, working to support marriages, funeral prayers, and other financial needs of the community. CBOs can play an important role in social mobilization, behavior change in target villages, and tariff collection and O&M of the schemes.

### 5.12 Pressing Needs of the Consulted Villages Suggested by Local People

Local people were consulted to determine the most pressing needs in the project area as perceived by them. The most important needs identified were the provision of water supply and sewerage systems, as well as schools, hospitals/dispensaries, and vocational training institutes for construction work. Due to restricted mobility, locals suggested that a friendly grievance mechanism be developed in all villages to address their concerns during the construction period. Additionally, they recommended that guidance and support be provided to local people for registration of complaints in proposed grievance mechanism.

### 5.13 Disclosure of ESMP

Public disclosure enables affected groups and interested parties to understand likely implications of the project and to provide input into project design. It promotes dialogue among stakeholders i.e. government, community, NGOs and implementing agencies. As per OP 4.01, the environmental and social aspects must be discussed with the stakeholders.

The objectives of public disclosure are to aid meaningful public consultation and to ensure transparency of World Bank operations to its stakeholders and constituents.



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The safeguard documents will be disclosed on the website of PRMSC and on the World Bank projects and operations site.

Presentations containing project information and relevant aspects of public interest will be delivered to the public. Furthermore, project brochures, handouts of presentations, and executive summaries of ESMP in Urdu and English languages will also be distributed to the public.

After the approval, Copies of the ESMP shall be made available to communities and interested parties in accessible locations through local government authorities, (e.g., Village councils, district offices etc.)



## ANTICIPATED ENVIRONMENTAL IMPACTS & MITIGATION MEASURES

### 6.1 General

This chapter identifies the beneficial as well as the potentially significant adverse environmental and social impacts of the proposed project activities during design/ pre-construction, construction and operational phases of the proposed project on the physical, ecological and socio-economic domains of the environment. The appropriate mitigation and remedial measures are proposed in this chapter. A brief description of each aspect and the affected environment in the project area are presented below.

### 6.2 Scoping of Impacts

Potential environmental and social impacts from the proposed Project on key environmental and socio-economic features in the Project area were identified through the following actions:

- Demarcation of the Area of Influence (Aoi);
- Desk study of engineering investigations, studies and designs;
- Environmental monitoring of air, noise, surface water, wastewater and groundwater;
- Detailed review and analysis of primary and secondary data available for all environmental parameters in Project area such as physical, ecological and social resources;
- Socio-Economic survey to assess the extent of land acquisition, occupation, income and poverty levels of the affected households;
- Consultations with executing and implementing agencies, local government, affected community, and traditional and religious leaders of community;
- Stakeholder consultations with relevant departments, government agencies, NGOs and locals; and
- Knowledge assimilation of international best practices on environmental assessment of infrastructure projects.

### 6.3 Methodology

Selection of an appropriate and customized methodology for the impact assessment is critical for the ESMP study. The impacts have been assessed on the basis of proposed project life cycle i.e., Pre-Construction, Construction and Operational and Maintenance (O&M) stages. For the identification of the potentially significant and non-significant environmental and social impacts, different tools were utilized as detailed below:

#### 6.3.1 Screening Checklist

Based on the findings of desk studies and processed satellite imageries, screening checklists was prepared to screen out the potentially significant adverse environmental and social impacts during pre-construction, construction and operational phase of the proposed project. The objective of the impact screening is to assess the significance of the issues related to the atmosphere, climate, water resources, land resources, ecological environment, socio-economic environment, transport, infrastructure and communication, natural risks, hazards



and external constraints of the Project for the proposed development. After the compilation of baseline information, processing of acquired satellite imagery, the screening checklist was filled to screen out the adverse impact of the proposed Project during the pre-construction, construction and operational phases. Then a screening report was prepared and submitted for the perusal to the Client and WB.

### 6.3.2 Notion of Significance

The “notion of significance” is based on the following criteria:

**Extent:** The scale of impact, i.e., limited to the immediate areas of development activity (the site); limited to within a distance reach of the development or affecting the region as a whole; or occurring at a national or international scale;

**Duration and Frequency:** A prediction/forecasting of the lifetime of the impact: i.e., short-term; medium term; long term with the impact ceasing after the operational life of the development; or considered permanent and how many times the event will occur during that period;

**Intensity:** A description of the intensity (magnitude/size) of the impact: i.e., high, medium, low, or negligible (no impact). The specialist studies must attempt to quantify the magnitude of impacts and outline the rationale used. Where appropriate, national standards are to be used as a measure of the level of impact;

**Reversible/Irreversible:** Changes considered irreversible, for example, the loss of biodiversity due to a change in water quality;

**Probability:** The likelihood that the event will actually occur; and

**Legal Restriction:** If the action is likely to affect, or be affected by a legal restriction.

Taking into account these criteria, potential significance was classified as either:

**Low:** an impact for which no mitigation is necessary;

**Medium:** an impact that requires effective mitigation; and

**High:** an impact, which, if not mitigated, could stop the Project from proceeding.

The potentially significant impacts were then further investigated in more detail to make a comprehensive assessment of the actual impacts.

### 6.3.3 Study Area/ Area of Influence

Refer Chapter 4: Description of the Environment, **Section 4.3**.

## 6.4 Anticipated Impacts during Pre-Construction/Design Phase

Impacts envisaged during Pre-construction/ Design Phase and the recommended mitigation measures are given below:



#### **6.4.1 Layout Planning & Design**

##### **Potential Impact**

Incompatible layout plans and engineering designs of the proposed project can undermine the overall aesthetics and ambience of the project area. Misutilization of the available spaces may result in design with low social acceptability and functionality. This impact will be permanent and moderate adverse in nature.

##### **Mitigation Measures**

- All structural, layout and engineering designs of the project are in strict accordance with the applicable national and international guidelines/ codes/ standards and engineering practices;
- The layouts of water supply and sewerage networks have been adjusted to cover the whole project area. The water supply system is based on loop design and sewerage system is based on gravity where the slopes have been provided to ensure gravity flow with adequate velocity.

#### **6.4.2 Environmentally Responsive Design Considerations**

##### **Potential Impact**

Designing of the project components without considering the prospective and futuristic needs can result in structures with low social acceptability and functionality. Improper designed sewers may not carry the waste load, leading to system-failure and financial loss. The alignment of sewer lines and locations of sewerage pumping station and STP must be properly planned, else it may lead to both technical and social problems along with environmental issues of backflow creating foul smell and unhygienic conditions.

There are chances of infiltration from sewers which may contaminate the soil and underground water resources. The seepage may also affect the water supply lines and contaminate the potable water.

The construction of high-rise overhead water tanks may cause visual obstruction. The surrounding community may face privacy issues and it may also cause blockage of direct sunlight.

##### **Mitigation Measures**

- All sewer lines including trunk, lateral and branch sewer lines have been designed considering the future population and waste generation rate;
- Limited the sewer depth where possible;
- Sewers will be laid 1m away from water supply lines if the width of the street will be sufficient to do so.
- In all cases, the sewer lines shall be laid below water pipeline (the difference between top of the sewer and bottom of water pipeline shall be at least 300 mm);



- Designed manhole covers to withstand anticipated loads & ensure that the covers can be readily replaced if broken to minimize silt/ garbage entry;
- Ensured sufficient hydraulic capacity to accommodate peak flows & adequate slope in gravity mains to ensure self-cleansing velocity in order prevent to built-up of solids.
- The location of overhead water tanks, pumping stations and STP have been finalized in close consultation with local community and representatives of local authorities.

### **6.4.3 Groundwater**

#### **Potential Impact**

Groundwater contamination may occur during construction by the improper handling of construction material (fuel, lubricant, bitumen, asphalt etc.) or sanitary water from construction camps and domestic sewage. During operation probability of seepage through the sewers may also contaminate groundwater. This impact is permanent and moderate negative in nature.

#### **Mitigation Measures**

- Construction materials that may lead to groundwater contamination will be properly handled and stored.
- Procedure for efficient jointing of selected sewer pipes will be applied to avoid leakage from pipes;
- Alternate sewage disposal arrangements have been suggested in design to cater the sewage flow, generated from the project area, during construction phase.

### **6.4.4 Surface Water**

#### **Potential Impact**

There is no existing piped sewerage network or pumping station in the village. There is one large sewage pond in the villages where sewage is disposed by unplanned drains. Thus, endangering the environment of the vicinity. The openly flooded sewage causes nuisance in terms of foul smell and serves as breeding ground for disease causing vectors. Some sewage is also used to irrigate nearby crops.

There will be net environmental improvement in terms of sewage collection thus reducing sewage ponding in the project area and enabling adequate treatment of wastewater.

#### **Mitigation Measures**

- The sewage will be collected through a piped network;
- An STP based on ABR technology will be established to treat the sewage;
- The treated effluent as per PEQS will be discharged into the existing watercourses for agricultural purposes.

### **6.4.5 Seismic Hazard**



## **Potential Impact**

According to the seismic zoning map of Pakistan, the project area is located in Seismic Zone 2A except Kallar Kaha which is located in Seismic Zone 2B. A low to moderate intensity earthquake impacting the project site can adversely impact the development. This factor requires special consideration of the designers as project structures (especially overhead water tanks and STP) may be affected negatively in case of earthquake tremors and the significance of damage depends upon the severity of earthquake. However, no major earthquake has hit Bhawana since past multiple decades.

## **Mitigation Measures**

- The components of the proposed project include laying of underground water supply network, sewer lines, construction of overhead water tanks, pumping station and STP have been designed to withstand moderate earthquakes; and
- To mitigate the seismic hazard, Seismic Building Code of Pakistan 2007 (SBC-07) has been adopted. This code specifies minimum requirements for seismic safety of buildings/ structures and has to be applied and used by engineers in conjunction with the necessary understanding of the concepts of structural, geotechnical and earthquake engineering.

### **6.4.6 Damage to Existing Infrastructure**

## **Potential Impact**

The proposed project interventions are mostly subsurface activities and are likely to affect the existing infrastructure. The public utilities such as electric poles which might get affected during construction activities and movement of machinery and the community will face temporary electricity cuts. Furthermore, the roads will be cut for laying of water and sewerage pipes and will create accessibility issues.

## **Mitigation Measures**

- Alignment of water supply and sewerage network carefully selected to minimize disturbance to public utilities;
- Relocation of the public utilities shall be planned and approved in consultation with relevant departments/authorities/stakeholders before project commencement if any, to avoid inconvenience to the public;
- The local community will be informed before relocation of services (if any) and schedule of relocation services will be prepared after consultation with the community to minimize inconvenience to the public;

### **6.4.7 Physical Cultural Resources**

## **Potential Impact**

No historical/ archeological site is present in the project area. However, some cultural resources including mosques, graveyard and shrines are present. People visit the mosques



five times a day. Shrines and graveyard are visited occasionally by the surrounding community and devotees. These will not be directly affected but the people may face access issues in visiting these facilities.

### **Mitigation Measures**

- The alternative access routes will be provided in case the access has to be restricted during execution period; and
- There must not be any physical impact on the physical and cultural resources in the project area.

### **6.4.8 Fire Fighting System**

#### **Potential Impact**

In case of fire hazards, inefficient firefighting system at campsite may cause severe damage to the camp site and surrounding crops and houses.

#### **Mitigation Measures**

- Contractor will provide firefighting system (fire alarm and fire extinguishers) for construction camp, workshop and construction site; and
- A separate fire alarm system will also be installed at construction camp and near the construction site.

### **6.4.9 Land Acquisition**

#### **Potential Impact**

As described in Table-6 Land Requirement, the majority of the land needed in Tehsil Bhowana, Liaqatpur, and Kehror Pakka will be acquired through the State Land NOC process. However, in Tehsil Pakpattan, Kalar Kahar, Kot Momin, Bhawalnager, and Khairpur Tamiwali, the land will be acquired through voluntary land donation. The primary aspect of the project involves the laying of sewers and water supply lines, and the right-of-way (ROW) of existing streets and roads will be used for this purpose. Prior to the start of execution activities, the landowners will be consulted and given permission for the use of their land.

### **6.5 Anticipated Impacts during Construction Phase**

Anticipated Impacts during Construction Phase and the recommended mitigation measures are given below:

#### **6.5.1 Topography**

#### **Potential Impact**



The construction activities are not expected to impact the topography of the area significantly except for those areas where physical activities i.e., earthwork is involved as well as stocking of material. The excavated material is to be mostly backfilled and the excessive material will be transported to strengthen the roadsides or will be dumped at the designated locations. This impact is site-specific, temporary, reversible, possible, and low significant.

### **Mitigation Measures**

- Material stockpiles will be removed as soon as work is completed and the area will be reinstated;
- Temporary storage sites will be allocated for the storage of excavated material;
- Temporary storage sites will be lined and must not allow infiltration;
- The stockpiles must be covered with tarpaulin sheets or other adequate material;
- Piling of material at large extent will not be allowed and the contractor will timely remove excavated material from the site.

### **6.5.2 Soil Erosion**

#### **Potential Impact**

The soil would be exposed to erosion due to excavations for laying of sewers and water supply pipes. Construction activities such as clearing, excavation, filling, grading and setting up construction camps will affect the existing soil condition in the study area/ Aol. The clearing of vegetation can also loosen the soil and make it more susceptible to erosion due to wind and rain. There is also a possibility of silt runoff during rainy season causing soil erosion. This impact can be categorized as low adverse, site-specific, long term, highly probable and reversible.

#### **Mitigation Measures**

- Good engineering practices such as compaction of backfill material to acceptable extent to minimize the soil erosion at the construction sites. Special slope protection measures will be adopted during the construction stage.
- Use of heavy machinery will be restricted as far as possible to avoid the destruction of soil structure;
- Confining excavations to the specified spots as per the approved engineering drawings and unnecessary excavations should be avoided;
- Stored excavated material shall be covered and preferably reused, e.g., in construction as backfill etc.

### **6.5.3 Soil Contamination**

#### **Potential Impact**

Contamination of soil may be caused by oil and chemical spills from construction machinery or uncontrolled runoff from equipment washing yards. This impact is permanent and minor negative in nature.



### **Mitigation Measures**

- Chemicals/ hazardous products and wastes will be stored on impermeable surfaces in secure, covered areas with clear labelling of containers and with a tray or bund to contain leaks;
- All construction wastes from the site will be regularly removed and transported to approved waste disposal sites;
- Awareness in emergency spill response procedures will be conducted through trainings;
- Oil leakages, chemicals and other liquids spills will be avoided/ minimized by providing appropriate storage places depending on the type of material for storage.

#### **6.5.4 Trench Failure**

### **Potential Impact**

The major construction activities involve excavation operations for laying water supply and sewerage lines. The major hazard associated with the excavation operations is trench failure. The unstable slopes may fail and settle in the trenches which may cause injuries and fatalities to the workers. This impact is probable, site specific and high adverse in nature.

### **Mitigation Measures**

- Provision of adequate shuttering in the trenches;
- Leftover shuttering may also be used in case of loose soil strata.

#### **6.5.5 Construction Camps/Camp Sites**

### **Potential Impact**

Improper construction camp location and mismanagement of construction camp activities can lead to various social and environmental impacts which may include noise, health and safety, traffic problems, soil degradation, loss of vegetation and assets on the selected land, solid waste and water pollution. Furthermore, cultural differences, behavior of construction workers, potential disregard for local cultural norms can lead to increased tension between local communities and workers residing in the construction camps. This impact is temporary and moderate negative in nature.

### **Mitigation Measures**

- Working hours of noisy activities will be limited to normal daytime working hours when near identified sensitive receptors;
- Waste Management Plan will be implemented to include procedures for the classification, storage and disposal of all construction wastes and the training of employees who handle hazardous materials; and
- Construction camps will be established away from populated areas.
- Regular training of workers will be carried out regarding local cultural norms, human



behaviour, gender issues by the contractor during construction activities at site.

### **6.5.6 Water Quality**

#### **Potential Impact**

Runoff from the construction works site may contain increased load of sediments, suspended solids and other contaminants. Potential sources of pollution from the site include:

- Runoff and erosion from exposed soil surfaces, earthwork areas and stockpiles e.g., grouting and cement material with the rain;
- Wash water from dust suppression sprays;
- Fuel and lubricants from maintenance of construction vehicles and mechanical equipment;
- Spillage of liquids stored on-site such as oil, diesel, and solvents etc. are likely to result in water pollution; and
- Uncontrolled discharge of debris and garbage such as packaging, construction material and refuse.

Construction waste, if left unattended will result in forming leachate that will percolate through the soil strata and will reach underground water table and hence, will end up contaminating groundwater. There is a probability that various materials like fuel, lubricant oil and other oily products, which are used during the construction phase may contaminate groundwater and channels carrying water.

There is no major surface water body near the project sites, however, canal distributaries and watercourses are present for irrigation purposes which may get contaminated.

#### **Mitigation Measures**

- Protection of groundwater reserves from any source of contamination such as the construction and oily waste by making the ground impermeable through sheets or compaction;
- Stockpiles of cement and other construction materials will be kept covered when not being used;
- Maintenance of vehicles will be carried out only on impermeable areas where any oil spillages can be contained;
- Careful planning of the works to avoid soil excavation works during rainy seasons;
- No activity will be undertaken in monsoon and careful attention must be paid to weather forecast before excavation operations.
- All kinds of waste will be stored in covered containers and disposed of safely as soon as possible; and
- The contractor will ensure that construction debris do not find their way into the drainage or irrigation canals which may get clogged.

### **6.5.7 Air Quality**

#### **Potential Impact**



Air quality will be affected by various construction activities. Emissions may be spread over longer distances depending upon the wind speed, direction, temperature of surrounding air and atmospheric stability. In certain climatic condition such as hot summer, airborne dust can become a major nuisance if control techniques are not properly employed. The critical sources of air pollution during the construction phase will be:

- Unpaved road surface;
- Transportation of materials;
- Excavation operations
- Vehicular exhaust; and

The air emissions may cause health impacts such as dryness and roughness of the throat, eyes, nose, etc. to the workers, staff of the contractor and the residents of area. These emissions may also affect the bio-physical environment. The impact is negative and temporary in nature.

### **Mitigation Measures**

- All vehicles, machinery, equipment and generators used during construction activities will be kept in good working condition, properly tuned and maintained in order to minimize the exhaust emissions;
- Open burning of solid waste from the contractor's camps will be strictly banned;
- Personal Protective Equipment (PPEs) like masks, goggles and gloves etc. will be provided to workers;
- PEQS applicable to gaseous emissions generated by construction vehicles, equipment and machinery will be enforced during construction works.
- Regular water sprinkling on the site and access roads will be carried out to suppress excessive dust emission(s);
- Blowing of dust and particulate matter from stockpiled loose materials (e.g., sand, soil) will be avoided either by sheeting them with tarpaulin or plastic sheets or by sprinkling them with light shower of water;
- The vehicles carrying construction materials and the construction material storage areas will be covered with tarpaulin.

### **6.5.8 Noise**

#### **Potential Impact**

Noise level is expected to increase during construction activities. Main sources of noise and vibration will be heavy machinery such as excavators and other equipment. Noise generated by construction machinery is likely to affect sensitive receptors located within Aol. Health risks associated with exposure to continuous noise levels include high blood pressure, hypertension, annoyance and sleep disturbance, temporary threshold shift etc. The impacts of noise will be temporary and highly adverse in nature.

### **Mitigation Measures**



- Construction workers will be provided suitable hearing protection like ear cap, or earmuffs and training them in their use;
- Selection of up-to-date and well-maintained equipment with reduced noise levels will be ensured by suitable in-built damping techniques or appropriate muffling devices; and
- Residents will be notified earlier before commencement of excavation operations.

### **6.5.9 Municipal and Construction Waste/ Wastewater**

#### **Potential Impact**

Due to construction activities municipal and construction waste will be generated from construction activities. The construction waste will include wastewater, domestic waste and construction waste etc.

Improper dumping of waste may generate odor and attract mosquitoes and other disease vectors. Empty containers containing the toxic, flammable and corrosive materials may pose hazard to the workers. This may result in health risk to workforce and public, if disposal site is improperly selected. This impact is temporary and minor negative in nature.

#### **Mitigation Measures**

- Solid waste generated during construction and camp sites will be safely disposed of in demarcated waste disposal sites and the contractor will provide and implement a comprehensive waste management plan;
- Burning of waste will be prohibited;
- Proper labelling of containers, including the identification and quantity of the contents, hazard contact information etc;
- Containers with covers will be provided on site to store waste; and

### **6.5.10 Chance of Finding Artifacts**

#### **Potential Impact**

During excavation, there is a chance of finding artifacts. In case of finding any artifact, the contractor will immediately stop the activities and report through Supervision Consultant to Directorate General (DG) of Archeology, Government of Punjab to take further appropriate action to preserve those antiques or sensitive remains.

### **6.5.11 Resource Conservation**

#### **Potential Impact**

The materials used in construction of proposed project would include coarse aggregates (crush), fine aggregates (sand), brick ballast, water and cement etc. Almost all the materials to be used in the construction of proposed project are non-renewable and therefore their sustainable use is necessary for the future use.



Large quantities of water will be used in the construction of concrete pipes, drains, pumping stations, STP, cradles and in watering the unfinished surfaces.

Diesel and residual fuel oils will be used to operate construction machinery and equipment. Sustainable use of energy resources is very important and it will also help to reduce air emissions. For conservation of energy, efficiency of the engines and burning processes is very important.

### **Mitigation Measures**

- Wastage of water will be reduced by training the workers involved in water use;
- Water jets and sprays will be used for watering surfaces rather than using overflow system;
- Reuse of construction waste materials will be considered;
- The efficient and well-maintained equipment and machinery will be used;
- The equipment and machinery will be turned off when not in use;

### **6.5.12 Biodiversity Conservation**

#### ***Flora***

#### **Potential Impact**

On account of construction of the proposed water supply and sewerage system, no trees are envisaged to be cut/disturbed but some herbs or shrubs may be required to be removed for the purpose of excavation. The dust emissions due to excavation operations will stick on the leaves of existing trees and may close their stomata thus hindering the photosynthesis process. Reduced photosynthesis may also reduce the productivity of existing trees. This impact is however temporary but minor negative in nature.

Further, during construction activities the Contractor's workers may damage the vegetation and trees (for use as fire-wood to fulfill the camps requirements).

#### **Mitigation Measures**

- The Contractor's staff and labour will be strictly directed not to damage any vegetation such as trees or bushes. They will use the paths and tracks for movement and will not be allowed to trespass through farmlands;
- Contractor will provide gas cylinders at the camps for cooking purposes and cutting of trees/ bushes for fuel will not be allowed.

#### ***Fauna***

#### **Potential Impact**



There will be no damage on health and life of local animals mostly cats, dogs and jackals and specially the livestock i.e., goats and cows due to construction activities. Some reptiles and insects may get killed/ injured during excavation operations.

### **Mitigation Measures**

- Excavations will be limited to the approved engineering drawings;
- Harassing of animals will be prohibited.

## **6.5.13 Health and Safety**

### **A. Occupational Health and Safety**

#### **Potential Impact**

OHS related risks include working at height (at exaction site & OHT construction site) Health risks and workers safety problems may result at the workplace if the working conditions provide unsafe and/or unfavorable working environment. The health and safety issues are also associated with the operation of construction machinery and equipment, which may cause minor and severe injuries to workers. It will be a long term and severe negative impact.

#### **Mitigation Measures**

- Obligatory insurance against accidents for labourers/workers;
- Providing basic medical training to specified work staff and basic medical service and supplies to workers;
- Layout plan for camp site, indicating safety measures taken by the contractor, e.g., firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents;
- Work safety measures and good workmanship practices will be followed by the contractor to ensure no health risks for labourers, including use of Personal Protective Equipment (PPE) i.e., oxygen masks/ kits etc.;
- Ear muffs will be provided to the workers doing job at excavators and other noise producing machines
- Adequate signage, lighting, barriers, yellow tape and persons with flags during construction to manage traffic at construction sites, haulage and access roads.
- Use of safety signs at the construction site, as shown below.



### **B. Community Health and Safety**

#### **Potential Impact**



The construction activities and vehicular movement at construction sites may result in roadside accidents particularly inflicting local communities who are not familiar with presence of heavy equipment. This is a temporary and moderate negative impact. The labors with different transmittable diseases (e.g., COVID-19) may cause spread out of those diseases in the local residents. Open trenches and deep manhole may cause accidents for the local residents.

### **Mitigation Measures**

- Medical screening of the laborers for communicable diseases will be conducted before hiring.
- The site will be restricted for the entry of irrelevant people particularly children;
- Provision of proper safety and diversion signage, particularly at sensitive/accident-prone spots;
- Setting up speed limits in close consultation within the village.
- COVID-19 SOPs will be followed at work site and construction camps, if any announced by the Government of Punjab during construction period
- Open trenches and deep excavated manholes will be protected by fence/barricade to avoid any accident.

## **C. Emergency Response (Natural and Man-Made Disasters)**

### **Potential Impact**

Natural disasters and accidents such as fire, falls, slips and trips may result in injuries, financial losses and may even lead to deaths. The workers will be trained and facilitated to cope with such emergencies.

### **Mitigation Measures**

- Training of the staff/employees regarding the emergency procedures/plans will be regularly conducted;
- Emergency numbers will be clearly posted; and
- First aid boxes will be provided.
- Minor incidents and near misses will be reported and preventive measures will be formulated accordingly.

## **6.5.14 Traffic Management**

### **Potential Impact**

The traffic influx within the villages is very low. Most of the traffic within the villages include motorbikes and few cars. The project interventions will not create traffic congestion issues in the project area. However, their movement will be disturbed due to the excavation and construction works and people may face accessibility issues. This impact is temporary and major negative in nature.



### **Mitigation Measures**

- The construction activities will be carried out in pockets/reaches, once a patch has been completed (i.e., pipes are laid and covered) then excavation on new patch shall be started;
- Local community will be taken on board to plan alternate access routes in connecting streets to ensure mobility of local traffic; and
- Plan work in a minimum possible time.

### **6.5.15 Nuisance/ Disturbance to Social Sensitive Areas (Educational, Health and Religious Places)**

#### **Potential Impact**

Since the proposed interventions will be carried out within the villages boundaries, therefore, the socially sensitive sites/places including schools, hospitals and religious centers will be temporarily affected due to dust, noise and the community will face accessibility issues due to open trenches. Dust due to earthworks will create health hazard to children and people with ailments. This impact is temporary and major negative in nature.

#### **Mitigation Measures**

- No work will be conducted near the religious places during religious congregations;
- Material transport to the site will be scheduled considering school timings;
- Notify concerned schools, hospitals/dispensary etc. 2 weeks prior to the work; conduct a 30 minutes awareness program on nature of work, likely disturbances and risks and construction work, mitigation measures in place, entry restrictions and dos and don'ts; and
- Implement all measures suggested elsewhere in this report – dust and noise control, public safety, traffic management, strictly at the sites.

### **6.5.16 Accessibility**

#### **Potential Impact**

Excavation of trenches and pipe/sewer laying work in the project area will obstruct access to residences, commercial buildings and businesses adjacent to the proposed project alignment. Disruption of access to commercial establishments may affect livelihood. The potential impacts are negative and moderate but short-term and temporary.

#### **Mitigation Measures**

- Leave space for access between mounds of excavated soil;
- Consult affected business people to inform them in advance about the work schedule;
- If there are any holidays (i.e., Eid or Muharram etc.), the Contractor will complete the backfilling work of the trenches and will not leave any trench open before holidays;
- Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for concerns/complaints; and



## 6.5.17 Resilience to Climate Change

### **Potential Impact**

Flooding due to torrential rains in 2014, resulted in displacement of 2,352 people<sup>6</sup> of District Chiniot. However, the effect of flood was in the north of Bhawana-Painsra Road in the areas along the river bed. The project site has never been hit by flash floods in the past. However, due to climate change, the project area is vulnerable to recurrent urban flooding. Torrential rains and heavy rainfall mostly occur in the month of July under the effect of tropical storms.

There are chances that the open trenches may get flooded during rainy season. Flooding can hamper the construction of overhead storage tanks, pumping station and STP. This impact can be categorized as direct, local, medium term, temporary and reversible.

### **Mitigation Measures**

- Project components have been designed to withstand flooding;
- The capacity of the sewerage/ drainage system have been designed and constructed based on extreme weather conditions predicted under international climate change models for Bhawana region to cater for extreme storm water runoff.

## 6.5.18 Liquid and Solid Waste from Construction Camps

### **Potential Impact**

Development of construction camps will generate significant quantities of liquid and solid waste.

The water consumption at the campsites will be approximately 5 gallon/capita/day and will subsequently generate about 70 to 80% of this water as sewage. Disposal of wastewater without treatment will pollute the soil and surface water/ groundwater resources of the area.

Construction Camps will generate about 0.28 kg/capita/day domestic solid waste comprising kitchen waste, garbage, putrescible waste, rubbish, and small portion of ashes and residues.

### **Mitigation Measures**

To dispose the liquid and solid waste generated from the construction activities, the following steps will be taken by the Contractor:

- The waste generated from the camp site will be disposed of at existing dumping site of the Tehsil Bhawana by the Contractor;
- Construction workers and supervisory staff will be encouraged and educated to practice waste minimization, reuse and recycling to reduce quantity of the waste;
- Domestic and chemical effluents from the construction camp will be disposed of by the development of on-site sanitation systems i.e., septic tank prior to discharge to nearby

<sup>6</sup> <https://reliefweb.int/report/pakistan/rainfloods-2014-chiniot-punjab-mini-district-profile-rapid-needs-assessment-17-sep>



drain. Septic tank will be located adjacent to the construction camp. Proper monitoring to check the compliance of PEQS will be carried out;

- All the solid waste from the camps will be properly collected at source by placing containers and disposed of through proper SWM system. Toxic waste will be handled, stored, transported and disposed separately;
- The waste will be properly sealed in containers with proper labels indicating the nature of the waste; and
- Solid waste will be segregated at source so that it can be re-used or recycled.

### **6.5.19 Flammable and Hazardous Materials**

#### **Potential Impact**

Flammable materials to be used during the construction activities include diesel, furnace oil, petrol, Liquefied Petroleum Gas (LPG), kerosene oil and machinery fuels. These materials present little risk to the environment, if properly transported stored and used; otherwise, they are potentially very dangerous. Improper storage and handling practices for these flammable and explosive materials can pose dangers of fire and blasts in the area. Training of employees involved in the transportation of hazardous material regarding emergency procedures should be ensured.

Unsafe disposal of excavated material may not only create the environmental degradation but also a nuisance for the surrounding community. Moreover, trenches, if left open, may prove to be hazardous to labor and locals of the area. This impact is site-specific, temporary, reversible, possible, and low significant.

#### **Mitigation Measures**

- Safety procedures will be followed by the contractor and labors strictly while using, handling and storage of these materials;
- Trainings will be provided to the contractor's staff for handling and using of flammable materials and explosives;
- For safety of construction labors and immediate communities, it is suggested that contractor's staff will be trained about the procedures of safe use, handling and storage of materials;
- Emphasis will be to decrease the volume of mucking material by reusing and then the disposal at the marked area in environment friendly way. In order to reduce the volume of disposal material, maximum part of the excavated material can be used in other activities filling of borrow areas and natural depressions in the project area. In order to increase the aesthetics of the area, native grass can be planted by dumping the surplus material in the proposed area with suitable soil cover.

### **6.5.20 Gender Based Violence (GBV)**

#### **Potential Impacts**



During construction phase, gender-based violence might arise due influx of outside labour. Sexual harassment against women might occur as a consequence of mixing of men and women at the construction site, and moving on the roads and markets. This impact is negative in nature during construction stage.

### **Mitigation Measures**

With the effective measures and monitoring, the risk of gender-based violence could be minimized by adopting the following mitigation measures:

- Awareness will be created among the females at individual and community levels about the construction sites;
- Workers will not be allowed to crowd in the residential communities within the site;
- Alternative routes for pedestrian will be provided to avoid mixing of women with workers;
- Raise awareness among the communities of the potential risks of GBV, and establish response services in the nearby communities that can respond to instances of GBV (particularly those related to issues of labor influx);
- Contractor will take proper measures to address and resolve issues relating to harassment, intimidation, and exploitation.

#### **6.5.21 Influx of Labor**

### **Potential Impacts**

For the implementation of project activities, skilled and unskilled labor is required by the contractor. Mostly, skilled and unskilled workers have been associated with the contractor since long which they utilize, where they are required for the projects, and while other workers are hired from the different areas that belong to different cultural backgrounds. Social problems and conflicts that are associated with labor influx are as follows:

- **Risk of social conflict:** Conflicts may arise between the local community and the construction workers, which may be related to religious, cultural or ethnic differences, or based on competition for local resources;
- **Increased risk of illegitimate behaviour and crime:** The influx of workers and service providers into communities may increase the rate of crimes and a perception of insecurity by the local community. Such illegitimate behaviour and crimes can include theft, physical assaults, substance abuse, sexual assault and human trafficking;
- **Increased risk of communicable diseases and burden on local health services:** The influx of people may bring communicable diseases to the project area, including sexually transmitted diseases (STDs), or the incoming workers may be exposed to diseases to which they have low resistance. Workers with health concerns relating to substance abuse, mental issues or STDs may not wish to visit the project's medical facility and instead go anonymously to local medical providers, this can result in an additional burden on local health resources; and
- **Local inflation of prices, accommodations and rents:** A significant increase in demand for goods and services due to labor influx may lead to local price hikes and crowding out of community consumers. Depending on project worker income and form of



accommodation provided, there may be increased demand for accommodations, which again may lead to price hikes and crowding out of local residents.

### **Mitigation Measures**

- Labour camp(s) will be established away from residential population;
- Preference will be given to the local people to work with contractor, and contractor should hire maximum labour force from the project area because this will reduce the labour influx;
- Awareness will be created among the work force to ensure respect for local customs;
- Construction work will be completed within the stipulated time to move workers to next location;
- Labor force will be shuffled with the time;
- An effective GRM has been established for the project to resolve all issues related to the community. Thus, progress regarding resolving the issues should be monitored closely.
- Create awareness among workers on proper sanitation and hygiene practices to endorse proper health and maintain good housekeeping practices at all project sites;
- Provide adequate personal hygiene facilities in good condition with adequate supply of clean water;
- Make arrangements to treat the affected workers on time to control the movement of vectors disease;
- Sensitize workers and surrounding communities on awareness and prevention of HIV/AIDS and sexually transmitted infections (STI) through training, awareness campaigns and workshops during community meetings;
- Provide proper and free HIV/AIDS and STI health screening and counselling for site workers and community members;
- Develop and enforce a strict code of conduct for workers to regulate behaviour in the local communities;
- Prohibiting drugs, alcohol, weapons, and ammunition on the worksite among personnel;
- Site security preparations must be contained within the Bills of Quantities (BOQs) to avoid any delays which might be caused due to insecurity;
- Appropriate fencing, security check points, gates and security guards should be provided at the construction sites to ensure the security of all plant, equipment, machinery and materials, as well as to secure the safety of site staff; and
- The Contractor must guarantee that good relations are maintained with local communities and their leaders to help reduce the risk of vandalism and theft.

### **6.5.22 Social/ Cultural Conflicts**

#### **Potential Impact**

During the construction phase of the project, conflicts may arise between labor force and local community. Furthermore, difference in cultural values may also cause discomfort to local residents. This impact is temporary and minor negative in nature.

#### **Mitigation Measures**



- Public notification through announcements in local mosques during the entire construction phase to avoid any inconvenience in accessibility to the locals;
- Establishment of formal links with affected communities;
- Plan for social grievance redress mechanisms including the local leaders and community representatives;
- Local labor will preferably be employed for construction works;
- Careful planning and training of workforce to minimize disturbance to the local people; and
- Contractor will preferably arrange their own sources of water.

### **6.5.23 Child Labor**

#### **Potential Impact**

Due to poverty and feeble financial situation of the area, the underaged children might get involved with the contractor various construction works. This will be the violation of the Child Labor Act. Furthermore, SEA/SH issues might arise which will create social conflicts. This impact is adverse and temporary in nature.

#### **Mitigation Measures**

- Standard clause in the contracts related to child labor explicit prohibitions, etc. and contractor will ensure compliance to the contractual provisions on bonded of law. Similarly equal wages for similar work will be followed.

### **6.5.24 Economic Activity**

#### **Potential Impact**

Due to the construction of the proposed Project, economic activity will be generated in the project area as the laborers and semi-skilled staff will have an opportunity to work in the project area. This will provide them an opportunity to develop their skills and capacities. It will also benefit the local vendors of the project area. This is a positive impact.

## **6.6 Anticipated Impacts during Operational Phase**

Anticipated impacts during Operational Phase and the recommended mitigation measures have been described under biophysical and socio-economic categories as follows:

### **6.6.1 Soil**

#### **Potential Impact of STP**

The soil quality may be affected due to leakage/ infiltration from sewer lines and STP bed. The sludge generated from cleaning/ maintenance of pumping stations, manholes, sewers and STP may contaminate the soil. The liner of the STP, while desludging may get dried and cracks may lead to the seepage of wastewater and thus contaminate the soil. Improper disposal of scum and sludge is another concern. This is a moderate negative impact.



### **Potential Impact of Leachate from Dumping Site**

The collected solid waste will be dumped into the existing dumping site of Tehsil Bhawna. There is no arrangement of leachate collection and no liner material is present there which will result in contamination of soil due to leachate. The situation will exacerbate in the rainy seasons. This is moderate negative impact.

#### **Mitigation Measures**

- Sludge shall be treated prior to ultimate use/disposal. Various options for sludge treatment include Digestion, Drying/ Dewatering, Composting, Lime Stabilization, Heat Treatment must be considered etc;
- The liner of STP must be regularly maintained and checked for any cracks and leakages;
- An engineering landfill site must be constructed (under a separate project) to avoid the issues of leachate contamination.

### **6.6.2 Air Quality**

#### **Potential Impact of Sewerage System**

The operation of sewerage scheme will result in generation of gases including H<sub>2</sub>S and CH<sub>4</sub>. H<sub>2</sub>S is a foul-smelling poisonous gas which might be harmful for the sewer-men and could be fatal sometimes. CH<sub>4</sub> is natural gas also referred to as a greenhouse gas. Pakistan is signatory to the United Nations Framework Convention on Climate Change (UNFCCC) and adopted Kyoto Protocol in 1997. Under the Kyoto Protocol, Pakistan is committed to reduce GHG emissions into the environment to prevent interference with climate change. The GHG emissions for the proposed project are a concern due to the anaerobic conditions in the sewer lines and wet wells of the disposal station.

#### **Potential Impact of STP**

The proposed STP is based on Anaerobic Baffled Reactor (ABR) technology which will generate significant amount of CH<sub>4</sub>. Methane is the primary contributor to the formation of ground-level ozone, a hazardous air pollutant and greenhouse gas, exposure to which causes 1 million premature deaths every year. This impact is permanent and high adverse in nature.

#### **Mitigation Measures**

- Provision of exhaust gas vents at appropriate locations in the design;
- Sewer-men will cover their faces with gas mask while entering the sewer for cleaning or maintenance purposes;
- It's better to use sucking machinery for cleaning of sewers;
- Use gas detector before inspection;
- Adequate tree plantation must be done around the STP to control the spread of odour; and
- Options for capture CH<sub>4</sub> and H<sub>2</sub>S that can be used commercially may be considered.



### 6.6.3 Odour

#### **Potential Impact of STP**

STP are designed on adequate waste loading and function well if they are not overloaded. The overloading will result in malfunctioning of STP and it will result in significant odour generation in the vicinity. This impact is temporary and high adverse in nature.

#### **Mitigation Measures**

- The STP should not be overloaded and personnel dealing in operation should be trained to avoid operational issues;
- Adequate tree plantation must be undertaken to avoid spread of odour in the vicinity.

### 6.6.4 Solid Waste

#### **Potential Impact of Sewerage System**

Domestic and hazardous wastes would be generated during cleaning and maintenance activities. The solid waste during operational phase will consist of plastics, metal and organic wastes present in sewer lines which can cause blockage in sewerage system. This impact is major negative and permanent in nature.

#### **Potential Impact of STP**

Solid waste will be separated from the wastewater through screens. If these wastes are not properly handled, odour will be generated and efficiency of STP will be reduced over time. This impact is moderate negative and temporary in nature.

#### **Protentional Impact of Solid Waste Management**

The waste containers, if not emptied timely, will create nuisance and attract mosquitoes and diseases vectors. The situation will exacerbate in the rainy seasons. Furthermore, there would be littering during transportation of waste from the villages to the dumping site.

#### **Mitigation Measures**

- Waste shall be collected, stored and disposed of according to relevant standards in approved facilities;
- An organized collection system and its implementation through a licensed contractor;
- The containers will be timely removed and the fine will be imposed on contractor in case of violations;
- Closed containers will be used for transportation of waste to the dumping site;
- Schedule inspection of the sewer lines and STP to keep it clean and to identify any hazardous material; and
- Solid waste bins shall be placed at appropriate locations to avoid its mixing in wastewater.



### **6.6.5 Sludge**

#### **Potential Impact**

Sludge is semi solid material which will be settled at the bottom of the STP due to anaerobic decomposition of biomass. Significant amount of sludge will not be produced in ABR, however, periodic desludging will be done to achieve good removal efficiency. The removed sludge in wet form, if left unattended will create nuisance i.e., odor, soil contamination, groundwater contamination (through percolation/ seepage) and will serve as breeding ground for disease vector.

#### **Mitigation Measures**

- Appropriate sludge treatment must be undertaken before disposal of sludge;
- The sludge must never be left unattended and should be transferred to designated dumping site after adequate treatment;
- Dried sludge can be used as a land conditioner in the fields.

### **6.6.6 Water Quality**

#### **Potential Impact of STP**

The major portion of treated wastewater from the STP will be discharged in watercourses and will be used for agricultural purposes. However, accidental discharges of untreated wastewater due to the overflow, syphoning or disruption in operation during maintenance of the treatment plant may cause contamination.

There is probability of the seepage of wastewater from the bed of STP that may contain high concentrations of organic matter and heavy metals. Improper functioning or choking of inlet or outlet of the treated wastewater may also cause the groundwater contamination. The impact is moderate negative and permanent in nature.

#### **Mitigation Measures**

- Use the suitable lining material to control the seepage and groundwater contamination;
- In case of maintenance/sludge removal, alternative ponds shall remain functional; and
- Inlet and outlet pipework access/maintenance pits should be inspected regularly for blockages. These pits should be covered at other times.

### **6.6.7 Resilience to Climate Change**

#### **Potential Impact of STP**

Temperature is the controlling factor and most important parameter of STP. The STPs are designed to treat wastewater within specified range of temperature which is based on past meteorological data. The climatic changes in temperature may affect the functioning of STP.

Furthermore, flooding and unpredicted rainfall events may halt the STP operations.



### **Mitigation Measures**

- The design of STPs is robust and they can handle the wide range of temperatures;
- The water must be bypassed during rain and flooding.

### **6.6.8 Community Health Hazards**

#### **Potential Impact of Sewerage System**

During desludging and cleaning operations the sludge will be piled up temporarily along the manholes and will be a hazard for passers-by and local community. This impact is temporary and moderate negative in nature.

#### **Potential Impact of STP**

The treated wastewater from STP will be used in agricultures in nearby areas. The community using the part will be exposed to the effects of treated wastewater. This impact is permanent and moderate negative in nature.

### **Mitigation Measures**

Proper management of the STP is essential to avoid the adverse impacts. Moreover, proper methods to manage the treated effluent from STP have to be undertaken to ensure that it does not affect the environment around the area or cause health hazards to the people living there. Health and safety hazards during the operation phase can be prevented by appropriate precaution measures. To minimize the adverse impacts mitigation measures to be adopted are as follows:

- The treated wastewater shall be routed to the agricultural area in a way that there must not be physical contact of the community;
- The community must be educated on the effects of treated wastewater to avoid health issues;
- The sludge must be timely removed from the site and the area must be barricaded during desludging and cleaning periods.

### **6.6.9 Occupational Health and Safety Hazards**

Following occupational hazards are associated with treated wastewater handling:

#### **Potential Impact**

##### ***Infections***

- Infections resulting from direct contact with treated wastewater, and from infected wounds;  
and



- Intestinal infections that are transmitted by flies feeding on the STP.

### **Chronic Diseases**

- There is a chance of spreading of an epidemic of coronavirus disease (COVID-19) due to close interaction of the work force during operation of the STP.

### **Mitigation Measures**

The mitigation measures proposed to be adopted are as follows:

- The Contractor should prepare OHS and ERPs during operation phase;
- Instructing the workforce on handling of treated wastewater;
- Provide basic medical training to the specified work staff and basic medical service and supplies to workers;
- Obligatory insurance of work laborers against accidents;
- Provision of safety measures such as emergency sirens, firefighting equipment, first aid, and contingency measures in case of accidents; and
- Management should strictly enforce the recommended SOP to avoiding spreading of coronavirus disease.

## **6.7 Positive Impacts**

### **6.7.1 Improved Water Supply System**

Clean tap water is the dire need of five villages of Bhawana. Provision of adequate water supply system with reasonable supply of water will provide relief to the community and will resolve the major issue of “water” in the project area. Further there will be net improvement in community’s health.

### **6.7.2 Improved Sewerage System**

The proposed project will improve the overall sewerage and drainage system of the project area. Currently, the open wastewater drains in the streets result in foul odor, serves as breeding ground for disease vector and results in inconvenience to the road users and local community. The project will improve this situation by controlling overflows and proper disposal of wastewater/ storm water.

### **6.7.3 Improvement in Public Health, Hygiene and Sanitation**

With the improvement in sewerage and drainage system, improvement in health, hygiene and sanitation will also be observed. Foul odor will be eliminated and there would be no breeding grounds for diseases vectors. Thus, the project will improve public health, hygiene and sanitation conditions in the project area.

### **6.7.4 Landscape**

### **Potential Impact**



During the operation stage, new saplings of different plants would be planted to enhance the aesthetics to create a buffer zone and to compensate the environmental losses. This will have a positive impact of permanent nature. The presence of adequate flora at available spaces along the boundary of STP will help in absorbing flue gases and other air quality related impacts of proposed project operation. The plants will be beneficial in dust and noise suppression for the nearby community.

### **Mitigation Measures**

- The saplings planted in the project area against the trees affected and for enhancement of environment should be properly maintained throughout their growth.

### **6.7.5 Other Positive Impacts**

Some other positive impacts include the following:

- Economic development
- Employment generation
- Development of deprived areas
- Formation of model villages of tehsil Bhawana

### **6.8 Operational Sustainability**

The sewer pipes, STP and other components of the project will not function without maintenance, as silt inevitably collects in areas of low flow over time. Improper operation and maintenance of sewerage system may result in illegal ingress of municipal solid waste into manholes/sewers, deposition of silt/sludge reducing capacity of sewers significantly.

### **Mitigation Measures**

- Routine/ preventative maintenance and desilting shall be carried out as with the passage of time depositing silt becomes so hard that the blockage problems are experienced;
- Major causes of deposition of silt and floating matters in the sewers are the mixing of solid waste and smaller diameter sewer pipes. Placement of sufficient number of solid waste litter bins/containers shall be ensured along the roads and in streets to avoid entrance of solid waste into sewers;
- Immediate response to all sewer/drainage related complaints followed by prompt correction of defective condition;
- Regular cleaning of sewer lines to remove grease, grit, and other debris that may lead to sewer backups. Cleaning shall be conducted more frequently for problem areas;
- Inspection of the condition of sanitary sewer structures and identifying areas that need repair or maintenance. Items to note may include cracked/deteriorating pipes; leaking joints or seals at manhole; frequent line blockages; lines that generally flow at or near capacity; and suspected infiltration or ex-filtration;
- Any repairs will be conducted by sealing off the affected sewer and pumping the contents into tankers, after which the faulty section will be exposed and repaired following the same



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basic procedure as when the sewer was built. Trenches will be dug around the faulty section and the leaking joint will be re-sealed, or the pipe will be removed and replaced.

## **6.9 Cumulative Impacts**

The project activities will be undertaken within the boundaries of all 5 villages. Currently, no development and construction activity are being undertaken within these villages, therefore, there will be no cumulative impact of these activities.

## **6.10 Induced Impacts**

Beside some direct environmental and social impacts, the proposed project may have some induced impacts to the physical features of environment. The project is envisaged to improve the sewerage system of the project area but the ultimate disposal of sewage is the point of concern. However, the sewage is planned to be disposed of into the treatment plant which will ultimately discharge into the watercourses after adequate treatment.



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## ENVIRONMENTAL & SOCIAL MANAGEMENT & MONITORING PLAN

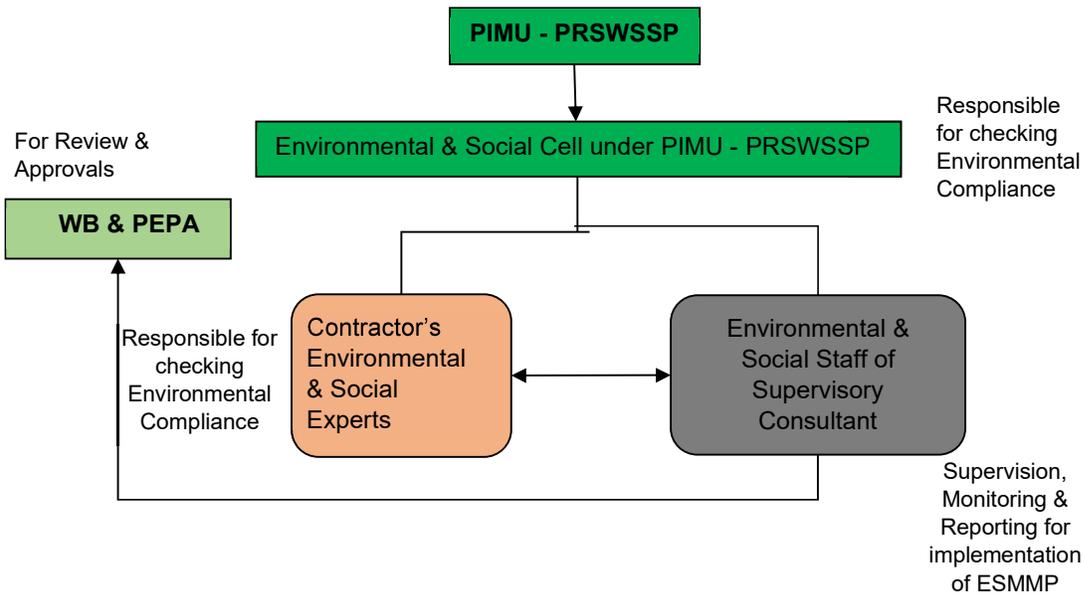
### 7.1 General

This section aims to address the measures which need to be adopted during each phase of the project to avoid, contain, mitigate or compensate for the potential impacts identified in **Section 6**. The Environmental & Social Management & Monitoring Plan (ESMMP) is the major part of this section and forms the gist of this study. ESMMP not only includes Best Management Practices (BMPs) but also includes monitoring indicators, frequency, responsibility, and estimated environmental budget. This ensures that mitigation, monitoring, and management consideration form a part of the documentation used for decision making and the basic benefit of defining the responsibilities is to make sure that the suggested mitigation measure will be implemented at the construction and operation stages of the project. A summary of the mitigation measures for potential impacts have also been given in this section to support ESMP. Moreover, a framework for the implementation of ESMP has been discussed in this section.

### 7.2 Implementation of Environmental & Social Management & Monitoring Plan (ESMP)

The institutional arrangement for the implementation of ESMMP for PRSWSSP is presented below. The proponent PIMU-PRMSC will be responsible for compliance of with environmental and social safeguard requirements of the proposed project.

The proposed project activities will be monitored and managed by the PIMU-PRMSC. The Environmental and Social Cell (ESC) staffed by qualified environmental and social specialists has already been established under PRSWSSP. The ESC will be the custodian of the ESMP. ESC will support ensuring the compliance of ESMP. ESC will submit progress reports for the implementation of the ESMP to WB and PEPA as per environmental approval/ NOC conditions for the PRSWSSP.



### Organizational Setup for implementation of ESMMP

#### 7.2.1 Roles and Responsibilities of the Functionaries involved in ESMMP Implementation

##### A. World Bank

The current proposed project falls under category E2 in view of limited environmental and social impacts and thus require an ESMP. World Bank shall review and approve the safeguard documents including ESMP. The Bank shall also review and approve the quarterly and biannually prepared progress reports.

##### B. Punjab Environmental Protection Department

As per Punjab Environmental Protection (Amendment) Act, 2012, Punjab EPD is responsible for environmental protection and pollution control. The Punjab EPD is responsible for the approval of the EIA/ IEE of all the developmental projects under their jurisdictions. As per Punjab Environmental Protection (Review of Initial IEE/EIA) Regulations 2022, Schedule-II, EIA is required for 'Water Supply, Sewerage System and Treatment (Category F) & Waste Storage and Disposal (Category G). Based on the EIA and ESMP, Punjab EPD will monitor (as and when required) the project activities.

##### C. PIMU-PRMSC

The Project Director of PIMU-PRMSC is the in-charge for the financial and technical matters related to PRSWSSP. His responsibilities for monitoring the ESMP will consist of:

- Ensuring that the required environmental training is provided to the concerned PIU staff;
- To carry out random site visits to the construction sites to review the environmental performance of the Contractor;



- Review monitoring reports for the progress of environment-related activities;
- Make sure that the Contractor is implementing the additional measures suggested by the Supervision Consultant (SC) in environmental monitoring reports;
- To assist the Contractor in obtaining necessary approvals from the concerned departments;
- Maintaining interface with the other line departments/ stakeholders; and
- Reporting to the Punjab EPD on the status of ESMMP implementation.

#### **D. Environmental and Social Cell (ESC)**

ESC has already been established in the PIMU-PRMSC which is responsible to:

- Make sure that all the contractual obligations related to environmental and social compliance are met;
- Monitor the progress regarding the implementation of environmental and social safeguards as provided in the ESMMP;
- Oversee the compliance of all the monitoring programs as given in ESMMP;
- Check randomly whether monitoring of the environmental aspects of the proposed project during construction and operational phases is being properly carried out;
- Document and disclose monitoring results and identify necessary corrective and preventive actions in the periodic monitoring reports, and make follow-up on these actions to ensure progress toward the desired outcomes;
- Make sure that the contractor implements the additional measures suggested by the SC and PIMU; and
- Report the status of ESMMP compliance to the Project Director, PIMU-PRMSC.

#### **E. Supervisory Consultant (SC)**

The roles and responsibilities of SC will be:

- To oversee the performance of the Contractor to make sure that the Contractor is complying with ESMMP;
- Ensuring that the day-to-day construction activities are carried out in an environmentally and socially sound and sustainable manner;
- Strong coordination with the Contractor and PIMU-PRMSC;
- Preparing training materials and implementing programs;
- Ensure the implementation of the mitigation measures suggested in ESMMP;
- To supervise and monitor environmental activities being performed at the site;
- Periodic reporting as mentioned in ESMMP; and
- Suggest any additional mitigation measures (if required).

#### **F. Construction Contractor (CC)**



Contractors will be bound to appoint site-based Environmental and Social managers with relevant educational backgrounds and experience for PRSWSSP. The contractors' Environmental and Social manager will carry out the following activities:

- Implementation of the mitigation measures at the construction site;
- Contractor will be bound through the contract to take actions against all the special and general provisions of the contract document;
- Contractor will make sure the compliance of ESMMP recommendations related to construction and will also be responsible for effective liaison with local heads of the community;
- Provision of proper Personal Protective Equipment (PPE) to the workers and train them for their proper use;
- Compliance with international best SOPs for COVID-19;
- To conduct the environmental and health & safety trainings to the workers/labour; and
- Coordinate with the Environmental Specialist and Social Development Specialist (SDS) of SC and PIMU.

In addition to the above, the CC shall also follow the **Environmental Code of Practice (ECOPs) attached as Annex – XIII.**

### **7.2.2 Institutional Arrangement for Implementation of ESMMP by PIMU-PRMSC during O&M Phase**

The proposed project will be administrated by PIMU-PRMSC during the O&M phase. The Project Director, PRMSC with his ESC will be responsible for the following:

- Compliance with ESMMP requirements for the O&M phase;
- Coordinating with the operational staff working under the ESC to monitor environmental compliance during project operation;
- Advising on, and monitoring tree plantations along the buffer zone of the project area;
- Reporting on the progress of environmental compliance to the Punjab EPD;
- Assessing the long-term environmental impacts of project operation;
- Sustaining a working partnership among the PIMU-PRMSC, Punjab Local Government Department, Punjab EPD, Agriculture, Irrigation, Forest and Wildlife departments of Punjab, NGOs, and other related public-private sector organizations.

### **7.3 Reporting**

The contractor will prepare and submit monthly monitoring reports for compliance of implementation to the supervision consultant (SC) environmental team.

The distribution of periodic reports is given in **Table 25.**

**Table 22: Distribution of Periodic Reports**



Report	Prepared by	Reviewed by	Distribution
Monthly	Contractor	Reviewed by PIMU-Environmental Unit; PRSWSSP	The Engineer and PRMSC and The World Bank
Quarterly	Contractor	Reviewed by PIMU-Environmental Unit; PRSWSSP	The Engineer, PRMSC and The World Bank
Annual	Contractor	Reviewed by PIMU-Environmental Unit; PRSWSSP	The Engineer, PRMSC and The World Bank
Final	Contractor	Reviewed by PIMU-Environmental Unit; PRSWSSP	The Engineer, PRMSC and The World Bank

#### 7.4 Non-Compliance with the ESMMP

The implementation of the proposed ESMMP involves inputs from various functionaries as discussed earlier. The contractor will be primarily responsible for ensuring the implementation of the mitigation measures proposed in the ESMMP, which will be part of the contract documents. The provision of the environmental mitigation cost will be made in the total cost of the project. However, if the contractor fails to comply with the implementation of ESMMP and submission of the monthly compliance reports, deductions will be made from the payments to the Contractor claimed under the heads of environmental components.

#### 7.5 Contractors ESMMP

The contractor will prepare a site-specific Contractor's ESMP (C-ESMP) based on the current ESMP and will get it approved by PIMU-PRMSC before the start of work. This will ensure the implementation of the ESMP based on the site conditions at the time of execution, by the contractor.

The C-ESMP will include the following sub-plans:

- Traffic management plan,
- OHS plan,
- Pollution prevention plan,
- Camp management plan

#### 7.6 Inclusion of ESMMP in Bidding/ Contract Documents

The present ESMP will be included in the bidding/ contract documents and their implementation will be contractual binding for the contractors.



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## 7.7 Environmental and Social Monitoring Plan

Monitoring will be carried out to ensure that the mitigation plans are regularly and effectively implemented. It will be performed at three levels. At the PIMU level, the ESC will do ESMMP monitoring to ensure that the mitigation plans are being effectively implemented. The environmental engineer of the Supervision Consultant will regularly monitor the ESMMP implementation by the contractor. At the contractor's level, the environmental monitoring checklist will be filled on daily basis by their environmental manager and countersigned by the environmental engineer (EE) of the Supervision Consultant.

**Table 26** outlines the parameters that will be monitored, the expected frequencies of monitoring, and the responsible agency for monitoring.

**Table 23: Environmental Management & Monitoring Plan (ESMMP)**

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
<b>Pre-Construction / Design Phase</b>							
Layout Planning & Design	Incompatible layout plans and engineering designs of the proposed project can undermine the overall aesthetics and ambiance of the project area	<ul style="list-style-type: none"> <li>All structural, layout and engineering designs of the project are in strict accordance with the applicable national and international guidelines/ codes/ standards and engineering practices;</li> </ul>	DC, PIMU-PRMSC	Design provisions	Once (after completion of Detailed Design)	PIMU	N/A
Improperly	Improper designed sewers may not carry the waste load, leading to system-failure and financial loss.	<ul style="list-style-type: none"> <li>All sewer lines including trunk, lateral and branch sewer lines have been designed considering the future population and waste generation rate;</li> </ul>	DC, PIMU-PRMSC	Design provisions	Once (after completion of Detailed Design)	PIMU	N/A
	The construction of high-rise overhead water tanks may cause visual obstruction.	<ul style="list-style-type: none"> <li>The location of groundwater storage tanks, overhead water tanks, pumping stations and STP have been finalized in close consultation with local community and representatives of local authorities.</li> </ul>	DC, PIMU-PRMSC	Design provisions	Once (after completion of Detailed Design)	PIMU	N/A
Groundwater	During operation probability of seepage through the sewers may also contaminate groundwater.	<ul style="list-style-type: none"> <li>Efficient seepage control measures have been considered in selection of pipe materials during the planning stage</li> <li>Procedure for efficient jointing of selected sewer pipes will be applied to avoid leakage from pipes</li> </ul>	DC, PIMU-PRMSC	Design provisions	Once (after completion of Detailed Design)	PIMU	N/A
			DC, PIMU-PRMSC	Design provisions	Once (after completion of Detailed Design)	PIMU	N/A



Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
Damage to Existing Infrastructure	There are no public utilities except the electric poles which might get affected during construction activities and movement of machinery and the community will face temporary electricity cuts.	<ul style="list-style-type: none"> <li>Alignment has been selected carefully to minimize disturbance to public utilities;</li> <li>Relocation of the public utilities shall be planned and approved in consultation with relevant departments/authorities/stakeholders before project commencement if any, to avoid inconvenience to the public.</li> </ul>	DC, PIMU-PRMSC	Design provisions	Once (after completion of Detailed Design)	PIMU	N/A
Physical Cultural Resources	No historical/ archeological site is present in the project area. However, some cultural resources including mosques, graveyards and shrines are present. These will not be directly affected but the people may face access issues in visiting these facilities.	<ul style="list-style-type: none"> <li>The alternative access routes will be provided in case the access has to be restricted during the execution period</li> </ul>	DC, PIMU-PRMSC	Design provisions	Once (after completion of Detailed Design)	PIMU	N/A
Fire Fighting System	In case of fire hazards, inefficient firefighting system at campsite may cause severe damage to the camp site and surrounding crops and houses. This will be a moderate adverse impact.	<ul style="list-style-type: none"> <li>Contractor will provide firefighting system for construction camp, workshop and construction site.</li> <li>A separate fire alarm system will also be installed at construction camp and near the construction site.</li> </ul>	DC, PIMU-PRMSC	Design provisions	Once (after completion of Detailed Design)	PIMU	N/A
			DC, PIMU-PRMSC	Design provisions	Once (after completion of Detailed Design)	PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
<b>Anticipated Impacts during the Construction Phase</b>							
Topography	The construction activities are not expected to impact the topography of the area significantly except for those areas where physical activities i.e., earthwork is involved as well as stocking of material. The excavated material is to be mostly backfilled and the excessive material will be transported to strengthen the roadsides or will be dumped at the designated locations. This impact is site-specific, temporary, reversible, possible, and low significant	<ul style="list-style-type: none"> <li>Material stockpiles will be removed as soon as work is completed and the area will be reinstated;</li> <li>Temporary storage sites will be allocated for the storage of excavated material;</li> <li>Temporary storage sites will be lined and must not allow infiltration</li> <li>The stockpiles must be covered with tarpaulin sheets or other adequate material;</li> <li>Pilling of material at large extent will not be allowed and the contractor will timely remove excavated material from the site.</li> </ul>	CC, SC, PIMU-PRMSC	Stockpiles and heaps of waste visible at the site.	Weekly	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Temporary storage sites will be allocated for the storage of excavated material;</li> </ul>	CC, SC, PIMU-PRMSC	Site allocation and preparation	Once	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Temporary storage sites will be lined and must not allow infiltration</li> </ul>	CC, SC, PIMU-PRMSC	Site allocation and preparation	Once	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>The stockpiles must be covered with tarpaulin sheets or other adequate material;</li> </ul>	CC, SC, PIMU-PRMSC	Provision of tarpaulin	Once	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Pilling of material at large extent will not be allowed and the contractor will timely remove excavated material from the site.</li> </ul>	CC, SC, PIMU-PRMSC	Stockpiles and heaps of waste visible at the site.	Weekly	SC and PIMU	N/A
Soil Erosion	The soil would be exposed to erosion due to excavations for laying of sewers and water supply pipes. Construction activities such as clearing, excavation, filling, grading and setting up construction camps will affect the existing soil condition in the study area/ Aol. The clearing of vegetation can also loosen the soil and make it more susceptible to erosion due to	<ul style="list-style-type: none"> <li>Good engineering practices will help to control or minimize soil erosion both at the construction sites and in peripheral areas including provision of shuttering;</li> <li>Use of heavy machinery will be restricted as far as possible to avoid the destruction of soil structure;</li> <li>Confining excavations to the specified spots as per the approved engineering drawings and unnecessary excavations should be avoided;</li> </ul>	CC, SC, PIMU-PRMSC	Provision of shuttering	Once	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Use of heavy machinery will be restricted as far as possible to avoid the destruction of soil structure;</li> </ul>	CC, SC, PIMU-PRMSC	Movement of machinery	Hauling of machinery	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Confining excavations to the specified spots as per the approved engineering drawings and unnecessary excavations should be avoided;</li> </ul>	CC, SC, PIMU-PRMSC	Excavations beyond the specified spots	During excavation works	SC and PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
	wind and rain. There is also a possibility of silt runoff during rainy season causing soil erosion. During the rain, the eroded soil will mix with stagnant water to transform into slush, which can affect movement of vehicles and machinery and construction workers as well as limit the movements of local people. This impact can be categorized as low adverse, site-specific, long term, permanent, highly probable and reversible.	<ul style="list-style-type: none"> <li>Stored excavated material shall be covered and preferably reused, e.g., in construction as backfill etc.</li> </ul>	CC, SC, PIMU-PRMSC	Wastage of excavated material; Backfilling	During backfilling	SC and PIMU	
Soil Contamination	Contamination of soil may be caused by oil and chemical spills from construction machinery or uncontrolled runoff from equipment washing yards. This impact is permanent and minor negative in nature.	<ul style="list-style-type: none"> <li>Chemicals/ hazardous products and wastes will be stored on impermeable surfaces in secure, covered areas with clear labelling of containers and with a tray or bund to contain leaks;</li> <li>All construction wastes from the site will be regularly removed and transported to approved waste disposal sites</li> </ul>	CC, SC, PIMU-PRMSC	Monitoring compliance to Regular disposal of Chemical/ Hazardous waste; Photographic record;	Monthly	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	No fall of transported material; Damaged road repaired. Record of harmful incidents that occurred.	Weekly	SC and PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
		<ul style="list-style-type: none"> <li>Washing yards will be paved to avoid seepage of runoff from the yard;</li> <li>Awareness in emergency spill response procedures will be conducted through trainings;</li> <li>Oil leakages, chemicals and other liquids spills will be avoided/minimized by providing appropriate storage places depending on the type of material for storage</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Weekly	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Provision of adequate shuttering in the trenches;</li> <li>Leftover shuttering may also be used in case of loose soil strata.</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Weekly	SC and PIMU	N/A
Trench Failure	The major construction activities involve excavation operations for laying water supply and sewerage lines. The major hazard associated with the excavation operations is trench failure. The unstable slopes may fail and settle in the trenches which may cause injuries and fatalities to the workers. This impact is probable, site specific and high adverse in nature.		CC, SC, PIMU-PRMSC	Visual Inspection	Weekly	SC and PIMU	N/A
Construction Camps/Camp Sites	Improper construction camp location and mismanagement of construction camp activities can lead to various social and environmental impacts which may include noise, health and safety, traffic problems, soil degradation, loss of vegetation and	<ul style="list-style-type: none"> <li>Working hours of noisy activities will be limited to normal daytime working hours when near identified sensitive receptors;</li> <li>Waste Management Plan will be implemented to include procedures for the classification, storage and disposal of all construction wastes and the training of employees who handle</li> </ul>	CC, SC, PIMU-PRMSC	Field Observations	Weekly	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Compliance to waste management plan;	Monthly	SC and PIMU	N/A



Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
	assets on the selected land, solid waste and water pollution. Furthermore, cultural differences, behavior of construction workers, potential disregard for local cultural norms can lead to increased tension between local communities and workers residing in the construction camps. This impact is temporary and moderate negative in nature.	<p>hazardous materials:</p> <ul style="list-style-type: none"> <li>Construction camps will be established away from populated areas.</li> <li>Regular training of workers will be carried out regarding local cultural norms, human behaviour, gender issues by the contractor during construction activities at site.</li> </ul>	CC, SC, PIMU-PRMSC	<p>Camp established at least 500m away from the nearest community;</p> <p>Local hired workforce;</p> <p>Any complaint from the local community.</p>	Once	SC and PIMU	N/A
Water Quality	Runoff and erosion from exposed soil surfaces, earthwork areas and stockpiles e.g., grouting and cement material with the rain. Construction waste, if left unattended will result in forming leachate that will percolate through the soil strata and will reach underground water table and hence, will end up contaminating groundwater. There is a probability that various materials like fuel, lubricant oil and other oily products, which are used during the construction phase may contaminate groundwater and channels carrying water.	<ul style="list-style-type: none"> <li>Protection of groundwater reserves from any source of contamination such as the construction and oily waste by making the ground impermeable through sheets or compaction;</li> <li>Stockpiles of cement and other construction materials will be kept covered when not being used;</li> <li>Maintenance of vehicles will be carried out only in impermeable areas where any oil spillages can be contained;</li> </ul>	CC, SC, PIMU-PRMSC	<p>Monitoring compliance;</p> <p>Water quality testing.</p>	Quadrimesterly	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	<p>Use of tarpaulin for protection;</p> <p>Visual inspection</p> <p>Any spill observed;</p> <p>Availability of sealed containers for used oils and lubricants;</p> <p>Disposal options (e.g., local</p>	Weekly	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	<p>Any spill observed;</p> <p>Availability of sealed containers for used oils and lubricants;</p> <p>Disposal options (e.g., local</p>	Weekly	SC and PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost		
Air Quality	Air quality will be affected by various construction activities. Emissions may be spreading over longer distances depending upon the wind speed, direction, temperature of surrounding air and atmospheric stability. In certain climatic condition such as hot summer, airborne dust can become a major nuisance if control techniques are not properly employed	<ul style="list-style-type: none"> <li>Careful planning of the works to avoid soil excavation works during rainy seasons;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection vendor) explored.	During rainy season	SC and PIMU	N/A		
		<ul style="list-style-type: none"> <li>No activity will be undertaken in monsoon and careful attention must be paid to the weather forecast before excavation operations.</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	During rainy season	SC and PIMU	N/A		
		<ul style="list-style-type: none"> <li>All kinds of waste will be stored in covered containers and disposed of safely as soon as possible;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Weekly	SC and PIMU	N/A		
		<ul style="list-style-type: none"> <li>The contractor will ensure that construction debris do not find their way into the drainage or irrigation canals which may get clogged.</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Weekly	SC and PIMU	N/A		
		<ul style="list-style-type: none"> <li>All vehicles, machinery, equipment and generators used during construction activities will be kept in good working condition, properly tuned and maintained in order to minimize the exhaust emissions;</li> </ul>	CC, SC, PIMU-PRMSC	Dust emission controlled;	Weekly	SC and PIMU	N/A		
		<ul style="list-style-type: none"> <li>Open burning of solid waste from the contractor's camps will be strictly banned;</li> </ul>	CC, SC, PIMU-PRMSC	Monitoring compliance to disposal of waste;	Weekly	SC and PIMU	N/A		
		<ul style="list-style-type: none"> <li>Fuel with substantially lower sulphur content will be preferred;</li> </ul>	CC, SC, PIMU-PRMSC			SC and PIMU	N/A		
		<ul style="list-style-type: none"> <li>Personal Protective Equipment (PPEs) like masks, goggles and gloves etc. will be provided to</li> </ul>	CC, SC, PIMU-PRMSC	Implementation of HSE; Visual Inspection	Daily	SC and PIMU	Cost given in		



Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
		workers;					ESMP Budget
		<ul style="list-style-type: none"> <li>• PEQS applicable to gaseous emissions generated by construction vehicles, equipment and machinery will be enforced during construction works.</li> </ul>	CC, SC, PIMU-PRMSC	Monitoring of machinery and equipment;	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>• Regular water sprinkling on the site and access roads will be carried out to suppress excessive dust emission(s)</li> </ul>	CC, SC, PIMU-PRMSC	Visual Monitoring	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>• Excavated trenches will be restored immediately to original level and paved after laying of sewer pipes;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>• Vehicle speed in the project area will be prescribed not more than 20 km/hr and controlled accordingly;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>• Diversion will be provided for local traffic movement;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>• The vehicles carrying construction materials and the construction material storage areas will be covered with tarpaulin.</li> </ul>	CC, SC, PIMU-PRMSC	Use of tarpaulin for protection	Daily	SC and PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
Dust	During construction stage, the dust level may increase considerably. Earthworks, site cleaning, stockpiling and hauling of materials will generate dust and affect the local air shed. Local people and the workers may be exposed to high dust levels during landscaping, access road and site preparation. This impact is site-specific, temporary, reversible, likely and medium significant.	<ul style="list-style-type: none"> <li>Blowing of dust from potential sources at the worksite will be avoided by shielding them from the exterior, for example using polythene curtains or raising a fence of corrugated sheets around areas of active constructions</li> <li>All excavation work will be sprinkled with water to control dust;</li> <li>Tires of all the vehicles leaving the site will be washed. No earth, mud, dust and the like will be deposited on the public road;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection  Air levels measured.	Daily	SC and PIMU	N/A
Noise	Noise level is expected to increase during construction activities. Main sources of noise and vibration will be heavy machinery such as excavators and other equipment. Noise generated by construction machinery is likely to affect sensitive receptors located within Aol. Health risks associated with exposure to continuous noise levels include high blood pressure, hypertension, annoyance and sleep disturbance, temporary threshold shift etc. The impacts of noise will be temporary and highly adverse in nature.	<ul style="list-style-type: none"> <li>Construction workers will be provided suitable hearing protection like ear cap, or earmuffs and training them in their use;</li> <li>Selection of up-to-date and well-maintained equipment with reduced noise levels will be ensured by suitable in-built damping techniques or appropriate muffling devices</li> <li>Residents will be notified earlier before commencement of excavation operations.</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspections;  Noise levels measured.	Daily	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Visual inspections;  Noise levels measured.	Daily	SC and PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
Municipal and Construction Waste/Wastewater	Due to construction activities municipal and construction waste will be generated from construction activities. The construction waste will include wastewater, oil spillage from machinery, domestic waste and construction waste etc.	<ul style="list-style-type: none"> <li>Solid waste generated during construction and camp sites will be safely disposed of in demarcated waste disposal sites and the contractor will provide and implement a comprehensive waste management plan;</li> <li>Burning of waste will be prohibited;</li> <li>Proper labelling of containers, including the identification and quantity of the contents, hazard contact information etc;</li> <li>Emergency Response plan will be prepared to address the accidental spillage of fuels and hazardous goods;</li> <li>Containers with covers will be provided on site to store waste</li> </ul>	CC, SC, PIMU-PRMSC	Monitoring compliance;	Weekly	SC and PIMU	N/A
Resource Conservation	The materials used in proposed project would include coarse aggregates (crush), fine aggregates (sand), brick ballast, water and cement etc. Almost all the materials to be used in the construction of proposed project are non-renewable and therefore their sustainable use is necessary for the future use. Excessive water consumption for drinking and washing purposes by	<ul style="list-style-type: none"> <li>Water jets and sprays will be used for watering surfaces rather than using overflow system;</li> <li>Source of water will be carefully selected. Water use will not disturb the existing community water supplies</li> <li>Reuse of construction waste materials will be considered;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Wastage of water will be controlled through providing proper valves and through controlling pressure of the water;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Wastage of water will be reduced by training the workers involved in water use;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Containers with covers will be provided on site to store waste</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Wastage of water will be reduced by training the workers involved in water use;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Wastage of water will be controlled through providing proper valves and through controlling pressure of the water;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Water jets and sprays will be used for watering surfaces rather than using overflow system;</li> <li>Source of water will be carefully selected. Water use will not disturb the existing community water supplies</li> <li>Reuse of construction waste materials will be considered;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Wastage of water will be reduced by training the workers involved in water use;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Wastage of water will be controlled through providing proper valves and through controlling pressure of the water;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Water jets and sprays will be used for watering surfaces rather than using overflow system;</li> <li>Source of water will be carefully selected. Water use will not disturb the existing community water supplies</li> <li>Reuse of construction waste materials will be considered;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
	the construction staff may undermine water resources in the project area and in certain cases may disturb the existing water supplies in the project area.	<ul style="list-style-type: none"> <li>Unnecessary equipment washings will be avoided;</li> <li>The efficient and well-maintained equipment and machinery will be used;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>The equipment and machinery will be turned off when not in use;</li> <li>Regular maintenance of machinery to avoid fuel leakages;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Campsites will be established on vacant land as far as possible, at least 500 m away from the residential areas;</li> <li>Construction vehicles, machinery and equipment will remain confined within their designated areas of movement;</li> <li>The Contractor's staff and labour will be strictly directed not to damage any vegetation such as trees or bushes. They will use the paths and tracks for movement and will not be allowed to trespass through farmlands;</li> <li>Contractor will provide gas cylinders at the camps for cooking purposes and cutting of trees/ bushes for fuel will not be allowed.</li> </ul>	CC, SC, PIMU-PRMSC	Log of vehicle and equipment repairs;	Daily	SC and PIMU	N/A
Biodiversity Conservation	<p><b>FLORA</b></p> <p>On account of construction of the proposed water supply and sewerage system, no trees are envisaged to be cut/disturbed. Hence there will be no direct impact on the flora of project area. However, the dust emissions due to excavation operations will stick on the leaves of existing trees and may close their stomata thus hindering the photosynthesis process.</p>		CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Log Book of vehicle inventory	Daily	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Any conflict with locals.	Daily	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
	<p><b>FAUNA</b> The local animals mostly cats, dogs and jackals and specially the livestock i.e., goats and cows will get disturbed due to construction activities, specially the noisy activities. However, there will be no damage to their health and life. Some reptiles and insects may get killed/injured during excavation operations.</p>	<ul style="list-style-type: none"> <li>Excavations will be limited to the approved engineering drawings;</li> <li>Harassing of animals will be prohibited</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspections; Photographic records. Visual Inspection	Daily	SC and PIMU	N/A
Health and Safety	<p>Health risks and worker's safety problems may result at the workplace if the working conditions provide unsafe and/or unfavorable working environment. The health and safety issues are also associated with the operation of construction machinery and equipment, which may cause minor and severe injuries to workers. It will be a long term and severe negative impact.</p>	<ul style="list-style-type: none"> <li>Obligatory insurance against accidents for labourers/workers;</li> <li>Providing basic medical training to specified work staff and basic medical service and supplies to workers;</li> <li>Layout plan for camp site, indicating safety measures taken by the contractor, e.g., firefighting equipment, safe storage of hazardous material, first aid, security, fencing, and contingency measures in case of accidents;</li> <li>Work safety measures and good workmanship practices will be followed by the contractor to ensure no health risks for labourers, including use of</li> </ul>	CC, SC, PIMU-PRMSC	Accident/ Incident reported.	If happened	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Maintained Training Record; Pictorial evidence	Weekly	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	Cost given in ESMP

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
		<p>Personal Protective Equipment (PPE) i.e., oxygen masks/ kits etc.;</p> <ul style="list-style-type: none"> <li>Protection devices (ear muffs) will be provided to the workers doing job in the vicinity of high noise generating machines i.e., excavators;</li> <li>Use of safety signs at the construction site, as shown below.</li> <li><b>COVID-19 SOPs (attached as Annex-XV)</b> will be followed at work site and construction camps;</li> <li>The construction activities will be carried out in pockets/reaches, once a patch has been completed (i.e., pipes are laid and covered) then excavation on new patch shall be started;</li> <li>Local community will be taken on board to plan alternate access routes in connecting streets to ensure mobility of local traffic;</li> <li>Plan work in a minimum possible time.</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
Traffic Management	<p>The traffic influx within the villages is very low. Most of the traffic within the villages include motorbikes and few cars. The project interventions will not create traffic congestion issues in the project area. However, their movement will be disturbed due to the excavation and construction works and people may face accessibility issues. This impact is temporary and major negative in nature.</p>		CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
Nuisance/ Disturbance to	<p>Since the proposed interventions will be carried out within the villages</p>	<ul style="list-style-type: none"> <li>No work will be conducted near the religious places during religious congregations;</li> </ul>	CC, SC, PIMU-PRMSC	Visual Inspection	Daily	SC and PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
Social Sensitive Areas	boundaries, therefore, the socially sensitive sites/places including schools, hospitals and religious centers will be temporarily affected due to dust, noise and the community will face accessibility issues due to open trenches. Dust due to earthworks will create health hazard to children and people with ailments. This impact is temporary and major negative in nature.	<ul style="list-style-type: none"> <li>Material transport to the site will be scheduled considering school timings;</li> <li>Notify concerned schools, hospitals/dispensary etc. 2 weeks prior to the work; conduct a 30 minutes awareness program on nature of work, likely disturbances and risks and construction work, mitigation measures in place, entry restrictions and dos and don'ts</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Implement all measures suggested elsewhere in this report – dust and noise control, public safety, traffic management, strictly at the sites.</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
Accessibility	Excavation of trenches and pipe/sewer laying work in the project area will obstruct access to residences, commercial buildings and businesses adjacent to the proposed project alignment. Disruption of access to commercial establishments may affect livelihood. The potential impacts are negative and moderate but short-term and temporary.	<ul style="list-style-type: none"> <li>Leave space for access between mounds of excavated soil;</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Consult affected business people to inform them in advance about the work schedule;</li> </ul>	CC, SC, PIMU-PRMSC	Consultation meeting; Pictorial evidence	Weekly	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>If there are any holidays (i.e., Eid or Muharram etc.), the Contractor will complete the backfilling work of the trenches and will not leave any trench open before holidays;</li> <li>Provide sign boards for pedestrians to inform nature and duration of construction works and contact numbers for</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspection Designated borrow and quarry areas used for access material; Visual inspection	Daily	SC and PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
Resilience to Climate Change	There are chances that the open trenches may get flooded during rainy season. Flooding can hamper the construction of overhead storage tanks, pumping station and STP. This impact can be categorized as direct, local, medium term, temporary and reversible.	<p>concerns/complaints:</p> <ul style="list-style-type: none"> <li>Project components have been designed to withstand flooding;</li> <li>The capacity of the sewerage/ drainage system have been designed and constructed based on extreme weather conditions predicted under international climate change models for Bhawana region to cater for extreme storm water runoff.</li> </ul>	CC, SC, PIMU-PRMSC	Design provisions	Once (after completion of Detailed Design)	SC and PIMU	N/A
Liquid and Solid Waste from Construction Camps	Development of construction camps will generate significant quantities of liquid and solid waste. A total of five (05) nos. construction camps will be established in all five villages accommodating approximately 30 skilled and unskilled staff each (i.e., total 150 workers for all villages).	<ul style="list-style-type: none"> <li>The waste generated from the camp site will be disposed of at existing dumping site of the Tehsil Bhawana by the Contractor;</li> <li>Construction workers and supervisory staff will be encouraged and educated to practice waste minimization, reuse and recycling to reduce quantity of the waste;</li> <li>Domestic and chemical effluents from the construction camp will be disposed of by the development of on-site sanitation systems i.e., septic tank prior to discharge to nearby drain. Septic tank will be located adjacent to the construction camp. Proper monitoring to check the compliance of PEQS will be carried out;</li> <li>All the solid waste from the camps will be properly collected</li> </ul>	CC, SC, PIMU-PRMSC	Check Meteorological department prediction of rain	Before construction	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Through Trainings Photographic record;	Monthly	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Monitoring compliance to	Weekly	SC and PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
		<p>at source by placing containers and disposed of through proper SWM system. Toxic waste will be handled, stored, transported and disposed separately;</p> <ul style="list-style-type: none"> <li>The waste will be properly sealed in containers with proper labels indicating the nature of the waste;</li> <li>Solid waste will be segregated at source so that it can be re-used or recycled</li> </ul>	<p>CC, SC, PIMU-PRMSC</p>	<p>Regular disposal of waste; Photographic record; Covered disposal containers placed at camp;</p>	<p>Weekly</p>	<p>SC and PIMU</p>	<p>N/A</p>
		<ul style="list-style-type: none"> <li>Solid waste will be segregated at source so that it can be re-used or recycled</li> </ul>	<p>CC, SC, PIMU-PRMSC</p>	<p>Covered disposal containers placed at camp;</p>	<p>Weekly</p>	<p>SC and PIMU</p>	<p>N/A</p>
		<ul style="list-style-type: none"> <li>Safety procedures will be followed by the contractor and labors strictly while using, handling and storage of these materials;</li> <li>Trainings will be provided to the contractor's staff for handling and using of flammable materials and explosives;</li> </ul>	<p>CC, SC, PIMU-PRMSC</p>	<p>Visual inspection</p>	<p>Daily</p>	<p>SC and PIMU</p>	<p>N/A</p>
		<ul style="list-style-type: none"> <li>For safety of construction labors and immediate communities, it is suggested that contractor's staff will be trained about the procedures of safe use, handling and storage of materials;</li> <li>Emphasis will be to decrease the volume of mucking material by reusing and then the disposal at the marked area in environment</li> </ul>	<p>CC, SC, PIMU-PRMSC</p>	<p>Monitoring compliance to handling of flammable material through inventory register; Photographic record; Visual observation</p>	<p>Daily</p>	<p>SC and PIMU</p>	<p>N/A</p>
Flammable and Hazardous Materials	<p>Flammable materials to be used during the construction activities include diesel, furnace oil, petrol, Liquefied Petroleum Gas (LPG), kerosene oil and machinery fuels. These materials present little risk to the environment, if properly transported, stored and used; otherwise, they are potentially very dangerous. Improper storage and handling practices for these flammable and explosive materials can pose dangers of fire and blasts in the area.</p>						

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
Gender Based Violence (GBV)	<p>During construction phase, gender-based violence might arise due to discrimination made against women by unequal work distribution and unequal pay structure among others. Sexual harassment against women might occur as a consequence of mixing of men and women at the construction site, and moving on the roads and markets. This impact is negative in nature during construction stage.</p>	<p>friendly way. In order to reduce the volume of disposal material, maximum part of the excavated material can be used in other activities filling of borrow areas and natural depressions in the project area. In order to increase the aesthetics of the area, native grass can be planted by dumping the surplus material in the proposed area with suitable soil cover.</p> <ul style="list-style-type: none"> <li>Awareness will be created among the females at individual and community levels about the construction sites;</li> <li>Workers will not be allowed to crowd in the residential communities within the site;</li> <li>Alternative routes for pedestrian will be provided to avoid mixing of women with workers;</li> <li>Raise awareness among the communities of the potential risks of GBV, and establish response services in the nearby communities that can respond to instances of GBV (particularly those related to issues of labor influx);</li> <li>The Contractor will make sure that no discrimination is made on the basis of gender while hiring of workers;</li> </ul>	<p>CC, SC, PIMU-PRMSC</p>	<p>Visual observation</p> <p>Visual Inspection</p> <p>Reported issues; Visual inspections</p> <p>Hiring Criteria</p>	<p>Twice a week</p> <p>Daily</p> <p>Daily</p> <p>Before Hiring</p>	<p>SC and PIMU</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
Influx of Labor	<p>Risk of social conflict: Conflicts may arise between the local community and the construction workers, which may be related to religious, cultural or ethnic differences, or based on competition for local resources;</p> <p>Increased risk of illegitimate behaviour and crime: The influx of workers and service providers into communities may increase the rate of crimes and a perception of insecurity by the local community. Such illegitimate behaviour and crimes can include theft, physical assaults, substance abuse, sexual assault and human trafficking;</p>	<ul style="list-style-type: none"> <li>Provisions of gender disaggregate bathing, changing, and sanitation facilities;</li> </ul>	CC, SC, PIMU-PRMSC	Design provisions	Once (before construction of construction camps)	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Contractor will take proper measures to address and resolve issues relating to harassment, intimidation, and exploitation, especially in relation to women.</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspection; Complaints reported	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Labour camp(s) will be established away from residential population;</li> </ul>	CC, SC, PIMU-PRMSC	As per approved site	Once	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Preference will be given to the local people to work with contractor, and contractor should hire maximum labour force from the project area because this will reduce the labour influx</li> </ul>	CC, SC, PIMU-PRMSC	Hiring Criteria	Once before hiring	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Awareness will be created among the work force to ensure respect for local customs;</li> </ul>	CC, SC, PIMU-PRMSC	Monitor training record	Monthly	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Construction work will be completed within the stipulated time to move workers to next location;</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Labor force will be shuffled with the time;</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspection	Weekly	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Create awareness among workers on proper sanitation and hygiene practices to endorse proper health and maintain good housekeeping practices at all project sites;</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
		<ul style="list-style-type: none"> <li>Provide adequate personal hygiene facilities in good condition with adequate supply of</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A



Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
		<p>clean water;</p> <ul style="list-style-type: none"> <li>Make arrangements to treat the affected workers on time to control the movement of vectors disease</li> <li>Sensitize workers and surrounding communities on awareness and prevention of HIV/AIDS and sexually transmitted infections (STI) through training, awareness campaigns and workshops during community meetings;</li> <li>Provide proper and free HIV/AIDS and STI health screening and counselling for site workers and community members;</li> <li>Develop and enforce a strict code of conduct for workers to regulate behaviour in the local communities;</li> <li>Prohibiting drugs, alcohol, weapons, and ammunition on the worksite among personnel;</li> <li>The Contractor must guarantee that good relations are maintained with local communities and their leaders to help reduce the risk of vandalism and theft.</li> </ul>	<p>CC, SC, PIMU-PRMSC</p>	<p>Visual inspection; Complaint reported</p> <p>Complaint reported</p> <p>Hiring protocols</p> <p>Visual inspection; Complaint reported</p> <p>Visual inspection; Complaints reported</p> <p>Visual inspection</p>	<p>Daily</p> <p>Weekly</p> <p>Before hiring</p> <p>Weekly</p> <p>Daily</p> <p>Daily</p>	<p>SC and PIMU</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
Social/ Cultural Conflicts	During the construction phase of the project, conflicts may arise between labor force and local community. Use of local resources and products by the construction workers can generate stress on the local biophysical resources. Furthermore, difference in cultural values may also cause discomfort to local residents. This impact is temporary and minor negative in nature.	<ul style="list-style-type: none"> <li>Public notification through announcements in local mosques during the entire construction phase to avoid any inconvenience in accessibility to the locals;</li> <li>Establishment of formal links with affected communities;</li> <li>Plan for social grievance redress mechanisms including the local leaders and community representatives;</li> <li>Local labor will preferably be employed for construction works;</li> <li>Careful planning and training of workforce to minimize disturbance to the local people;</li> <li>Contractor will preferably arrange their own sources of water.</li> </ul>	CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Visual inspection	Weekly	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	During construction of the work	Weekly	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Hiring Policies	Once (Before Hiring)	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Visual inspection	Daily	SC and PIMU	N/A
			CC, SC, PIMU-PRMSC	Visual observations	Daily	SC and PIMU	N/A

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
Child Labor	Due to poverty and feeble financial situation of the area, the underaged children might get involved with the contractor various construction works. This will be the violation of the Child Labor Act. Furthermore, SEA/SH issues might arise which will create social conflicts. This impact is adverse and temporary in nature.	<ul style="list-style-type: none"> <li>Standard clause in the contracts related to child labor explicit prohibitions, etc.) and contractor will ensure compliance to the contractual provisions on bonded and child labor, equal wages for similar work explicit prohibitions, etc.).</li> </ul>	CC, SC, PIMU-PRMSC	Visual Observation	Daily	SC and PIMU	N/A
<b>Anticipated Impacts during Operational Phase</b>							
Soil	The soil quality may be affected due to leakage/ infiltration from sewer lines and STP bed. The sludge generated from cleaning/ maintenance of pumping stations, manholes, sewers and STP may contaminate the soil. The liner of the STP, while desludging may get dried and cracks may lead to the seepage of wastewater and thus contaminate the soil. Improper disposal of scum and sludge is another concern. This is a moderate negative impact.	<ul style="list-style-type: none"> <li>Sludge shall be treated prior to ultimate use/disposal. Various options for sludge treatment include Digestion, Drying/ Dewatering, Composting, Lime Stabilization, Heat Treatment must be considered etc;</li> </ul>	PIMU-PRMSC	Visual inspection	Weekly	PIMU-PRMSC	N/A
Air Quality	The operation of sewerage scheme will result in generation of gases including H <sub>2</sub> S and CH <sub>4</sub> . H <sub>2</sub> S is a foul-smelling poisonous	<ul style="list-style-type: none"> <li>Provision of exhaust gas vents at appropriate locations in the design</li> <li>Sewer-men will cover their faces</li> </ul>	PIMU-PRMSC	Visual inspection	Monthly	PIMU-PRMSC	N/A
			PIMU-PRMSC	Visual inspection; Use of PPEs	Weekly	PIMU-PRMSC	Cost given

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
	gas which might be harmful for the sewer-men and could be fatal sometimes. CH <sub>4</sub> is natural gas also referred to as a greenhouse gas	<p>with gas mask while entering the sewer for cleaning or maintenance purposes;</p> <ul style="list-style-type: none"> <li>It's better to use sucking machinery for cleaning of sewers;</li> <li>Use gas detector before inspection;</li> <li>Adequate tree plantation must be done around the STP to control the spread of odour;</li> <li>The STP should not be overloaded and personnel dealing in operation should be trained to avoid operational issues;</li> </ul>	<p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p>	<p>Availability</p> <p>Visual inspection</p> <p>Visual inspection</p> <p>Visual inspection</p>	<p>Once</p> <p>Daily</p> <p>Weekly (maintenance)</p> <p>Daily</p>	<p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
Odour	STP are designed on adequate waste loading and function well if they are not overloaded. The overloading will result in malfunctioning of STP and it will result in significant odour generation in the vicinity. This impact is temporary and high adverse in nature.	<ul style="list-style-type: none"> <li>Waste shall be collected, stored and disposed of according to relevant standards in approved facilities;</li> <li>An organized collection system and its implementation through a licensed contractor;</li> <li>The containers will be timely removed and the fine will be imposed on contractor in case of violations;</li> <li>Closed containers will be used for transportation of waste to the dumping site;</li> </ul>	<p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p>	<p>Visual inspection</p> <p>Hiring of licensed contractor</p> <p>Visual inspection</p> <p>Visual inspection</p>	<p>Weekly</p> <p>Once</p> <p>Daily</p> <p>Weekly</p>	<p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>
Solid Waste	Domestic and hazardous wastes would be generated during cleaning and maintenance activities. The solid waste during operational phase will consist of plastics, metal and organic wastes present in sewer lines which can cause blockage in sewerage system.	<ul style="list-style-type: none"> <li>Waste shall be collected, stored and disposed of according to relevant standards in approved facilities;</li> <li>An organized collection system and its implementation through a licensed contractor;</li> <li>The containers will be timely removed and the fine will be imposed on contractor in case of violations;</li> <li>Closed containers will be used for transportation of waste to the dumping site;</li> </ul>	<p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p>	<p>Visual inspection</p> <p>Hiring of licensed contractor</p> <p>Visual inspection</p> <p>Visual inspection</p>	<p>Weekly</p> <p>Once</p> <p>Daily</p> <p>Weekly</p>	<p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p> <p>PIMU-PRMSC</p>	<p>N/A</p> <p>N/A</p> <p>N/A</p> <p>N/A</p>

Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
		<ul style="list-style-type: none"> <li>Schedule inspection of the sewer lines and STP to keep it clean and to identify any hazardous material;</li> <li>Solid waste bins shall be placed at appropriate locations to avoid its mixing in wastewater.</li> </ul>	PIMU-PRMSC	Visual inspection	Daily	PIMU-PRMSC	N/A
<b>Sludge</b>	Sludge is semi solid material which will be settled at the bottom of the STP due to anaerobic decomposition of biomass. Significant amount of sludge will not be produced in ABR, however, periodic desludging will be done to achieve good removal efficiency. The removed sludge in wet form, if left unattended will create nuisance i.e., odor, soil contamination, groundwater contamination (through percolation/ seepage) and will serve as breeding ground for disease vector.	<ul style="list-style-type: none"> <li>Appropriate sludge treatment must be undertaken before disposal of sludge;</li> <li>The sludge must never be left unattended and should be transferred to designated dumping site after adequate treatment;</li> <li>Dried sludge can be used as a land conditioner in the fields.</li> <li>In case of maintenance/sludge removal, alternative ponds shall remain functional;</li> <li>Inlet and outlet pipework access/maintenance pits should be inspected regularly for blockages. These pits should be covered at other times.</li> <li>The water must be bypassed during rain and flooding.</li> </ul>	PIMU-PRMSC	Visual inspection	Weekly	PIMU-PRMSC	N/A
		<ul style="list-style-type: none"> <li>The treated wastewater shall be routed to the agricultural area in a way that there must not be physical contact of the community;</li> <li>The community must be educated on the effects of treated wastewater to avoid health</li> </ul>	PIMU-PRMSC	Visual inspection	Monthly	PIMU-PRMSC	N/A
<b>Community Health Hazards</b>	During desludging and cleaning operations the sludge will be piled up temporarily along the manholes and will be a hazard for passers-by and local community. This impact is temporary and		PIMU-PRMSC	Visual inspection	Monthly	PIMU-PRMSC	N/A
			PIMU-PRMSC	Visual inspection	Monthly	PIMU-PRMSC	N/A
			PIMU-PRMSC	Visual inspection	Daily	PIMU-PRMSC	N/A
			PIMU-PRMSC	Visual inspection	During rain	PIMU-PRMSC	N/A
			PIMU-PRMSC	Visual inspection	Daily	PIMU-PRMSC	N/A
			PIMU-PRMSC	Through Seminars	Yearly	PIMU-PRMSC	N/A



Activity	Impacts	Mitigation Measures	Implementation Responsibility	Monitoring Indicators	Monitoring Frequency	Monitoring Responsibility	Cost
	<p>moderate negative in nature. The treated wastewater from STP will be used in agricultures in nearby areas. The community using the part will be exposed to the effects of treated wastewater. This impact is permanent and moderate negative in nature.</p>	<p>issues;</p> <ul style="list-style-type: none"> <li>The sludge must be timely removed from the site and the area must be barricaded during desludging and cleaning periods.</li> </ul>	PIMU-PRMSC	Visual inspection	Monthly	PIMU-PRMSC	N/A
<b>Occupational Health and Safety Hazards</b>	<p>Infections resulting from direct contact with treated wastewater, and from infected wounds; and Intestinal infections that are transmitted by flies feeding on the STP.</p>	<ul style="list-style-type: none"> <li>The Contractor should prepare OHS and ERPs during operation phase;</li> </ul>	PIMU-PRMSC	Implementation of OHS & ERPs	Daily	PIMU-PRMSC	N/A
		<ul style="list-style-type: none"> <li>Instructing the workforce on handling of treated wastewater;</li> </ul>	PIMU-PRMSC	Visual inspection	Daily	PIMU-PRMSC	N/A
		<ul style="list-style-type: none"> <li>Provide basic medical training to the specified work staff and basic medical service and supplies to workers;</li> </ul>	PIMU-PRMSC	Visual inspection;	Daily	PIMU-PRMSC	N/A
		<ul style="list-style-type: none"> <li>Obligatory insurance of work laborers against accidents;</li> </ul>	PIMU-PRMSC	Visual inspection	Fortnightly	PIMU-PRMSC	N/A
		<ul style="list-style-type: none"> <li>Provision of safety measures such as emergency sirens, firefighting equipment, first aid, and contingency measures in case of accidents;</li> </ul>	PIMU-PRMSC	Visual inspection	Monthly	PIMU-PRMSC	N/A

**KEY**

- CC Construction Contractor
- DC Design Consultant



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EPA Environment Protection Agency  
SC Supervision Consultant  
PIMU-PRMSC project Implementation Unit – Punjab Rural Municipal Services Company



## **7.8 Grievance Redressal Mechanism (GRM)**

The Grievance Redress Mechanism (GRM), outlines the policy and procedure for documenting, addressing, responding, and employing methods to resolve project grievances and complaints that may emerge during and after PRSWSSP sub-projects implementation. It will also cater to managing any disconnects that emerge from the field level and that have significant implications for the effective implementation of the sub-project interventions.

In an effort to deter fraud and corruption, the use of a dedicated mobile application has been proposed for reporting grievances from the field level to district and provincial headquarters. This will not only provide a coherent system of checks and balances but will also enable swift redressal and effective monitoring of complaints.

The PIMU at the Local Government & Community Development Department (LG&CDD) level will serve as the Secretariat for the Grievance Redressal Committee (GRC Directorate) that will be responsible for providing oversight on the entire GRM process at a strategic level and monitoring complaints management.

Water supply & sanitation are imperative daily basis facilities. Due to, continuous use and all-time requirement, there is a tendency for routine O&M requirements of the facilities. O&M will be needed as soon as project interventions are completed in the village. Due to the huge number of beneficiaries spread, a comprehensive complaint redressal model is indispensable for Service Delivery Unit (SDU). The Grievance Redress Mechanism (GRM) will be consistent with the Component 4 Project Management and Monitoring sub-component 4.2 Grievance Redressal Model is part of the Project of PRSWSSP. Project activities may cause social friction if Projects do not have an effective GRM.

### **7.8.1 Objectives**

The Grievance Redressal Mechanism (GRM) will be consistent with the requirements of the World Bank safeguard policies to ensure the mitigation of community concerns, risk management, and maximization of environmental and social benefits. The overall objective of the GRM is therefore to provide a robust system of procedures and processes that provides for transparent and rapid resolution of concerns and complaints identified at the village level.

The GRM will be accessible to diverse members of the community, including women, senior citizens, and other vulnerable groups. Culturally, appropriate communication mechanisms will be used at all sub-project sites both to spread awareness regarding the GRM process as well as complaints management. This GRM will be integrated with the PRSWSSP overall project GRM hotline

### **7.8.2 Disclosure of GRM**

The final processes and procedures for the GRM will be translated into local languages and disseminated at all sub-project locations. These shall be made available (in both leaflet and poster format) to all subproject locations through the offices of each SDU. Dedicated male and female Grievance Focal Persons for each sub-project location will play an instrumental role in



spreading awareness regarding the GRM, including the use of information technology for reporting and monitoring complaints.

### 7.8.3 Records and Monitoring

The Project Director's Office will maintain an electronic database at the PIMU that will provide a summary of complaints received and mitigations. The PD office will also provide an analysis of the grievances at each sub-project location using a pre-designed Monitoring and Evaluation (M&E) template that will give insight into the type of complaints received and a qualitative and quantitative review of grievance redressal. The PD's office will also be responsible for uploading the actions and results for each grievance for each sub-project location on a periodic basis to the Project website. The dedicated mobile application that will be used to communicate grievances will provide the basis for recording complaints both at the provincial and district levels.

Apart from the electronic database that will be maintained at the PIMU level, a manual register of all complaints and actions taken will be maintained by the Environmental and Social Focal Persons at the Office of the SDU-TOs and a manual register of all day-to-day complaints and their grievance redressal details will be maintained by VOs their office.

### 7.8.4 Proposed Institutional Mechanisms

It is proposed to establish the following prior to commencing project implementation activities including pre-construction activities:

Tehsil Level-Public Complaints Center (PCC) in SDU-TO will be responsible to receive, log, and resolve complaints at the site and in Village-level. The complainant would be able to launch a complaint on a toll-free number, mobile application, message, or telephone.



**Tier 1:** Village level –Panchayat/Village Councils made under Punjab Local Government (Amendment) Ordinance 2021 will act as the 1st tier of GRM at the village/community level.

**Tier 2:** Grievance Redress Committee (GRC-Tehsil Level) in SDU-TO will be established for each district that will manage GRM aspects for all sub-project locations in each district including decisions to be taken, actions and monitoring of complaints resolution at the sub-project level.

**Tier 3:** PIMU Level-GRC at PMIU (LG&CDD) will be responsible to oversee the overall functions of the GRM at a strategic level including monthly review.

### 7.8.5 GRM Process Implementation

The grievance redress process is described hereunder:

Through the envisaged system, the complainant would be able to launch a complaint on a toll-free number, mobile application, message, or telephone (GRM can accept anonymous grievances).

Details of the complaints and the complainants will be entered into the system and a complaint number will be provided to the complainant through SMS.

In SDU a specific person will be designated to monitor the system and issue necessary instruction to relevant quarter for necessary action.

The GRM will provide an interface to complainants to check the status of their complaint and a dashboard for SDU & PIMU to monitor the progress on the complaints.

The system will bridge the gap between the masses and the service provider.

Monitoring officers will precisely know the details of pending complaints in every SDU. The performance of the SDU could also be easily monitored through it.

The GRM will have a built-in escalation system for moving unresolved complaints to higher levels.

### 7.8.6 Mode of Complaint

The complainant can lodge their complaints by opting the following modes:

<b>Written Application</b>	<b>Telephonically</b>	<b>Verbally</b>	<b>Android Application</b>	<b>Website</b>

### 7.8.7 GRM Procedures and Timelines

The tracking and documenting of grievance resolutions will include the following elements:

- Tracking complainant(s) from subprojects sites (field and community level) to PIMU;
- Dedicated staff to update the database routinely;
- Promote transparency, publicize how complaints are being handled, and periodically evaluate the overall functioning of the mechanism;
- Processes for informing stakeholders about the status of a case; and
- Procedures to retrieve data for reporting purposes, including the periodic reports, from Village and Tehsil and document them into the monthly progress reports at PIMU. GR (Village level) will be responsible to receive, log, and resolve complaints at the village level. The Grievance Redress Committee at the village Panchayats will review and identify actions to be taken to address the complaints at its weekly meeting. If not resolved timely then complaint would be referred to GRC-Tehsil Level (SDU-TO) within 3 days after receiving.



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GRC-SDU-TO will try to resolve the complaints in a satisfactory manner anyhow, if not satisfactorily resolved by the village panchayats/councils and Tehsil level, then the grievance will be referred for consideration by GRC at the PIMU/LG&CDD level within one week.

Every effort will be made to address or resolve grievances within the following fixed timelines, which will be an indicator of the performance of the handling system. Acknowledgment of a written submission will be issued to the complainant within three working days.

If the complainant is not satisfied, the complaint will have the option to seek redress through the court of law.