WATER AND SANITATION AGENCY (WASA), LAHORE

LAHORE DEVELOPMENT AUTHORITY

SEWERAGE SYSTEM FROM LARECHS COLONY TO GULSHAN-E-RAVI, LAHORE (THROUGH TRENCHLESS TECHNOLOGY)

Final Draft Environmental and Social Due Diligence Report (ESDDR) for Associated Facility of "Construction of Wastewater Treatment Plant Babu Sabu, Lahore"

September 2025

31-B Zahoor Elahi Rd, Block B, Gulberg 2, Lahore, Punjab
Phone: (042) 99332100
wasa.punjab.gov.pk

TABLE OF CONTENTS

EXECUTIVE SUMMARY 4

1 INTRODUCTION 8

1.1 PROJECT BACKGROUND 8

1.2 OBJECTIVES OF THE PROJECT 8

1.3 EXISTING CONDITIONS 8

1.3.1 EXISTING SEWERAGE DISTRICT AREAS OF LAHORE 9

1.3.2 SEWERAGE SYSTEM OF BABU SABU AREA 9

1.4 AIIB POLICIES AND DIRECTIVES 10

1.4.1 ENVIRONMENTAL AND SOCIAL FRAMEWORK 10

1.4.2 ESS1 (ENVIRONMENTAL AND SOCIAL ASSESSMENT AND MANAGEMENT) 11

1.4.3 ESS2 (INVOLUNTARY RESETTLEMENT) 11

1.4.4 RATIONALE FOR ESDDR 11

1.5 SCOPE OF ESDDR 12

1.6 APPROACH AND METHODOLOGY FOR ESDDR 13

2 PROJECT DESCRIPTION 13

2.1 PROJECT OVERVIEW 13

2.2 PROJECT COMPONENTS OF WASTEWATER TREATMENT PLANT (WWTP) AT BABU SABU 16

2.3 INTEGRATION OF SEWERAGE SYSTEM THROUGH LARECH COLONY TO GULSHAN E RAVI IN LAHORE (THROUGH TRENCHLESS TECHNOLOGY) INTO WASTEWATER TREATMENT PLANT AT BABU SABU, LAHORE 17

3 ENVIRONMENTAL DUE DILIGENCE 17

3.1 ENVIRONMENTAL POLICY, LEGAL AND REGULATORY FRAMEWORK 17

3.2 ADMINISTRATIVE FRAMEWORK 19

3.2.1 WATER AND SANITATION AUTHORITY (LWASA), LAHORE 19

3.2.2 ENVIRONMENTAL PROTECTION AGENCY, PUNJAB 19

3.2.3 DUE DILIGENCE FINDINGS ON LEGAL AND REGULATORY FRAMEWORK 19

3.3 PERMISSIONS TO BE OBTAINED – STATUS FROM DUE DILIGENCE 20

3.4 POTENTIAL ENVIRONMENTAL RISK/IMPACTS DURING CONSTRUCTION AND OPERATION 20

3.5 ENVIRONMENTAL DUE DILIGENCE 21

3.5.1 POTENTIAL ENVIRONMENT RISKS/IMPACTS DURING CONSTRUCTION AND OPERATION PHASES 21

3.5.2 ENVIRONMENTAL MITIGATION PLAN 22

3.6 BASELINE DATA 22

3.6.1 PHYSICAL ENVIRONMENT 22

3.6.2 ECOLOGICAL ENVIRONMENT 23

3.6.3 BASELINE DUE DILIGENCE 24

3.7 EMP BUDGET 24

3.8 EMP BUDGET DUE DILIGENCE 24
4 SOCIAL DUE DILIGENCE 24
4.1 SCOPE OF SOCIAL DUE DILIGENCE 24
4.2 PRESENT STATUS OF LAND ACQUISITION AND RESETTLEMENT 25
4.3 LEGAL AND REGULATORY REQUIREMENTS 26
4.4 SOCIO-ECONOMIC PROFILE 27
4.5 RAP IMPLEMENTATION 28
4.6 LIVELIHOOD RESTORATION AND IMPROVEMENT PLAN 28
4.7 ELIGIBILITY AND ENTITLEMENT MATRIX 29
4.8 RAP BUDGET 30
4.9 INFORMATION DISCLOSURE AND CONSULTATION 30
4.9.1 SOCIAL 30
4.9.2 ENVIRONMENTAL 31
4.10 PUBLIC CONSULTATION 32
4.11 GRIEVANCE REDRESS MECHANISM 32
4.11.1 SOCIAL 32
4.11.2 ENVIRONMENTAL 33
4.12 INSTITUTIONAL ARRANGEMENTS 34
4.13 MONITORING AND EVALUATION 35
4.14 FINDINGS AND AREAS OF CONCERN FOR ENVIRONEMNTAL AND SOCIAL SAFEGUARDS 35
5 ENVIRONMENTAL AND SOCIAL CORRECTIVE ACTION PLAN 37
ANNEXURES 39
ANNEXURE-I 40
ANNEXURE-II 43

LIST OF TABLES

Table 1-1: Summary of Existing Sewerage District Areas 9

Table 3-1: EMP Budget 24

Table 5-1: Environmental and Social Corrective Action Plan 37

Table 4-1: International Agreements/Conventions Relevant to the Project ...**Error! Bookmark not defined.**

LIST OF FIGURES

Figure 1-1: Conceptual Diagram of Sewerage System of Babu Sabu 10
Figure 2-1: Map Detailing the Components of the Project 15
Figure 2-2: Flow diagram of CAS process 16

LIST OF ABBREVIATIONS

AFD	Agence Française de Développement
AH	Affected Household
AIIB	Asian Infrastructure Investment Bank
AM	Accountability Mechanism
AMSL	Above Mean Sea Level
AP	Affected Person
APC	Affected Persons Committee
BOD	Biochemical Oxygen Demand
CAS	Conventional Activated Sludge
CBD	Convention on Biological Diversity
CC	Construction Contractor
CMS	Complaint Management System
CO2	Carbon Dioxide
COD	Chemical Oxygen Demand
Cusec	Cubic feet per second
DC	Design Consultant
DS	Disposal Station
EAAS	Extended Aeration Activated Sludge
EC	Environmental Committee
ECSP	Engineering Consultancy Services Punjab
EE	Environmental Engineer
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
EPA	Environmental Protection Agency
EPC	Engineering, Procurement & Construction
EPCC	Engineering, Procurement & Construction Contractor
EPD	Environment Protection Department
ES	Environmental and Social
ESC	Environmental and Social Committee
ESDD	Environment and Social Due Diligence
ESDDR	Environment and Social Due Diligence Report
ESEL	Environmental and Social Exclusion List
ESF	Environment and Social Framework
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan

ESP	Environmental and Social Policy
ESS	Environmental and Social Standard
EUR	Euros
GBV	Gender based violence
GHGs	Green House Gases
GIIP	Good International Industry Practices
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
HSE	Health, Safety and Environment
IEE	Initial Environmental Examination
ILO	International Labor Organization
km	Kilometers
LAA	Land Acquisition Act
LAR	Land Acquisition and Resettlement
LDA	Lahore Development Authority
LDCs	Less Developed Countries
LRP	Livelihood Restoration Plan
LWASA	Lahore Water And Sanitation Agency
LWWMP	Lahore Water and Wastewater Management Project
MGD	Million Gallons per Day
NCS	National Conservation Strategy
NEQS	National Environmental Quality Standards
O&M	Operation and Maintenance
OIC	Organization of Islamic Countries
PAPs	Project Affected Persons
PD	Project Director
PEQS	Punjab Environmental Quality Standards
PMU	Project Management Unit
PMC	Project Management Consultants
PPE	Personal Protective Equipment
PWD	Public Works Development
RP	Resettlement Plan
SC	Supervision Consultant
SDGs	Sustainable Development Goals
SIA	Social Impacts Assessment
TSS	Total Suspended Solids
UN	United Nations

WASA	Water And Sanitation Agency
WB	World Bank
WWTP	Wastewater Treatment Plant

EXECUTIVE SUMMARY

ES-1: BACKGROUND AND SCOPE OF DUE DILIGENCE

Lahore, the capital of Punjab Province and Pakistan's second-most populous city, is situated near the River Ravi and the Indian border. The city spans over 350 square kilometers, and its Water and Sanitation Agency (LWASA), a subsidiary of the Lahore Development Authority (LDA), oversees water supply, sewerage, and drainage operations. Lahore faces significant challenges in wastewater management, with approximately 540 million gallons of untreated sewage discharged daily into the River Ravi. To address this, LWASA has planned to construct Wastewater Treatment Plants (WWTPs), starting with one at Babu Sabu, funded by Agence Française de Development (AFD). This project aims to meet environmental standards, reduce river pollution, enable treated water reuse for agriculture, and mitigate public health risks. The project aligns with the World Bank's Environmental and Social Framework (ESF), which emphasizes sustainable development and risk mitigation. Asian Infrastructure Investment Bank (AIIB) has been funding LWASA for the construction of a sewerage system in the central city. As per AIIB's ESF, an Environmental and Social Due Diligence Report (ESDDR) is required for WWTP Babu Sabu as an associated facility. This ESDDR is prepared to meet this requirement.

ES-2: PROJECT DESCRIPTION

The Babu Sabu Wastewater Treatment Plant (WWTP) is part of LWASA's initiative to address pollution in the River Ravi through the construction of WWTP at Babu Sabu. Three more Wastewater Treatment Plants (WWTPs) are planned to treat the sewerage of Lahore city by Ravi Urban Development Authority (RUDA) at the locations of Shad Bagh, Shahrah, and Mehmood Boti. The Babu Sabu WWTP project focuses on phase one (Babu Sabu Stage 1: BSS1), designed to meet wastewater treatment needs until 2035, with phase two planned to extend capacity until 2045. The project involves the design and construction of a WWTP to treat wastewater conveyed from Multan Road Disposal Station (DS) and Cantonment Drain. However, it excludes the creation of new wastewater or drainage collection systems. The treatment process incorporates sedimentation tanks for primary treatment, the conventional activated sludge (CAS) process for secondary treatment, and sludge digesters with cogeneration units to produce electricity from sludge digestion.

Key components of the project include the construction of the WWTP and related structures, a collector channel to connect the existing disposal stations to the WWTP, and upgrades to existing disposal and pumping stations. The WWTP employs CAS technology, with 50% of wastewater treated biologically and the remainder through sedimentation. Stabilized sludge will be safely disposed of using drying beds. The project phases and designs were reviewed and adjusted following studies by AFD experts and Groupe Huit, leading to the preparation of a new conceptual design under the "Babu Sabu Wastewater Project, Stage 1 (BSS1)." This phase will help LWASA improve wastewater management, reduce river pollution, and prepare for future capacity expansions.

The Construction of Wastewater Treatment Project (WWTP) at Babu Sabu is an associated facility to LWASA's project namely "Sewerage System from Laerch Colony to Gulshan-e-Ravi (Through Trenchless Technology)". This project aims to provide a sewerage conveyance system for the collection of wastewaters in central Lahore. The wastewater of this conveyance system will be disposed of ultimately to WWTP Babu Sabu once both projects are constructed.

ES-3: ENVIRONMENTAL DUE DILIGENCE

Environmental Due Diligence Report evaluates the environmental and social impacts of constructing a wastewater treatment plant in Lahore as envisaged in the EIA of WWTP Babu Sabu. The EIA is aligned with Pakistan's legal frameworks, including the Punjab Environmental Protection Act (1997) amended in 2017, the Punjab Flood Plain Regulation Act (2016), and international standards like the World Bank's Environmental and Social Framework (ESF) and Agence Française de Development (AFD) policies. These frameworks emphasize environmental sustainability, public safety, and local and international law compliance. The project has been categorized as high risk due to its potential long-term environmental and social impacts. Located in a floodplain, the site is at risk of flooding, necessitating measures like protective dykes and elevated equipment. Greenhouse gas emissions, tree removal, and land acquisition are significant concerns. Mitigations include compensatory tree plantations and resettlement plans. Air and noise pollution, waste management, traffic disruptions, and community resource strain are identified for the construction phase. Proposed measures include dust and noise control, waste segregation, and local hiring to minimize social disruptions. In the operational phase risks include sludge mismanagement, wastewater spills, and health hazards. Regular monitoring and contingency planning are emphasized to ensure compliance and safety.

The area is characterized by flat topography, semi-arid subtropical climate, and reliance on the Ravi River, which suffers from pollution and low water flow due to upstream interventions. Biological studies reveal no endangered species near the site, while socioeconomic surveys highlight inadequate infrastructure and services affecting the local population. Public and gender-specific consultations were conducted to address local concerns, including health, water quality, and mobility challenges. Stakeholder engagement was guided by both national and international standards, emphasizing transparency and inclusivity. Future consultations will ensure ongoing community involvement. It employs a three-tier GRM system which provides transparency and swift resolution of complaints from affected parties. Complaints can be submitted through various channels, and the GRM emphasizes accessibility, especially for marginalized groups.

The Water and Sanitation Authority (WASA) is responsible for compliance and implementation. An institutional framework involving environmental and social specialists ensures effective planning, monitoring, and execution of the Environmental and Social Management Plan (ESMP) and Resettlement Action Plan (RAP). Internal and external monitoring will verify adherence to mitigation measures and provide periodic reports to stakeholders. Monitoring activities are supported by qualified consultants and published for public access. The project budget includes PKR 299,286,750 for environmental and social staff, health and safety measures, and tree plantations. Itemization could enhance implementation. No additional costs are required to implement this ESDDR.

ES-4: SOCIAL DUE DILIGENCE

The project is critical for addressing Lahore’s wastewater management challenges. While it poses significant environmental and social risks, proposed mitigation measures and compliance frameworks aim to minimize these impacts. Future improvements in stakeholder engagement, itemized budgeting, and contingency planning are recommended to strengthen the project's implementation and acceptability. This report outlines the comprehensive social due diligence conducted for WWTP and highlights the project's potential to improve environmental health while safeguarding community and ecological interests.

The construction of the WWTP at Babu Sabu, Lahore, is part of the broader initiative to improve wastewater management in the city. The project involves the establishment of a treatment plant and an associated conveyance system. The implementation is divided into two stages: Babu Sabu Stage 1 (BSS1), with a capacity to serve up to 1.9 million people by 2035, and Stage 2 (BSS2), which will expand capacity to accommodate 2.18 million people by 2045. The preliminary Resettlement Action Plan (RAP) addresses the social impacts of Phase 1, focusing on land acquisition and resettlement while proposing compensation and livelihood restoration measures.

The project requires 836.4 acres of land, acquired in 1996 under the Land Acquisition Act (LAA) of 1894. Despite compensation being provided, legal disputes over the rates persist. Farmers continue to use the land for agriculture, creating encumbrances. Social impact assessments identified 82 Project-Affected Persons (PAPs), including user-owners, renters, tenants, and employees. Vulnerable groups, such as the elderly, disabled, and economically disadvantaged, were highlighted, with 6 PAPs identified as vulnerable. The project will impact 2,706 trees and 39 electric poles, necessitating mitigation measures. The RAP emphasizes equitable compensation for affected land use and assets. It includes measures such as livelihood disturbance allowances, vocational training, and employment opportunities for PAPs. Special allowances for vulnerable groups and severely impacted individuals are outlined to ensure economic recovery. A Livelihood Restoration and Improvement Plan (LRIP) proposes training programs, income-generating opportunities, and gender-specific support measures, including agricultural assistance and access to project-related jobs.

The LAA lacks provisions for non-titleholders, informal settlers, and livelihood restoration. In contrast, international standards like the World Bank's Environmental and Social Standard 5 (ESS5) advocate compensation at full replacement cost and inclusion of all affected groups. The RAP recommends harmonizing local practices with these global standards and incorporating socio-economic surveys, resettlement plans, and stakeholder consultations to ensure fairness.

Consultations with PAPs and stakeholders revealed concerns about resettlement, compensation, and impacts on property values. Measures such as odor management and green belts were discussed to minimize community impact. The Stakeholder Engagement Plan (SEP), included in the Environmental Impact Assessment (EIA), is recommended as a standalone document to streamline coordination with government agencies and address the needs of vulnerable groups. A three-tier GRM has been structured in the E&S Reports to address grievances transparently and efficiently. The mechanism involves community-level grievance committees, site-specific grievance redress bodies, and a Project Management Unit (PMU) committee for complex issues. Provisions for accessible complaint submission and public awareness campaigns ensure inclusiveness. GRM implementation at the planning stage is advised for effective grievance management. The implementation of the RAP is overseen by the Lahore Water and Sanitation Agency (LWASA) and supported by consultants and an Environment and Social Cell (ESC). The RAP includes internal and external monitoring mechanisms to ensure compliance with compensation and restoration measures. Progress will be reviewed through periodic reports submitted to stakeholders. The RAP budget is estimated at PKR 161.69 million, covering crop compensation, resettlement allowances, training programs, and administrative costs.

The report highlights the need for RAP updates to address gaps in socio-economic data and legal provisions. Additional measures, such as specific training plans, proactive GRM implementation, and focused stakeholder engagement, are recommended to enhance the project's social safeguards. By aligning with international standards and incorporating

community feedback, the project aims to achieve equitable outcomes while ensuring environmental and social sustainability.

ES-5: CORRECTIVE ACTION PLAN

The Environmental and Social Corrective Action Plan outlines measures to address gaps identified during the environmental and social assessments for the Babu Sabu WWTP project in Lahore. It provides a roadmap for revising assessments, updating action plans, and ensuring compliance with national and international standards. The focus is on environmental safeguards, social safeguards, stakeholder engagement, and grievance management.

The EIA requires updates to include enhanced sludge disposal strategies, such as using sludge for embankments, horticulture, or fodder production. It must also account for the flood risks to the project site and mitigation measures for operational failures of the treatment plant. The project still needs a No Objection Certificate (NOC) from the Irrigation Department to proceed, despite consultations being held. Key project documents, including permissions and the Grievance Redress Mechanism (GRM), must be translated into local languages to ensure accessibility for all stakeholders. Official notifications for Grievance Redress Committees (GRCs) are required, along with the placement of complaint registers at project offices and the dissemination of GRM-related information to stakeholders.

The RAP needs to be updated to include socioeconomic and census data of Project-Affected Persons (PAPs) who were initially unreachable or refused participation. A standalone SEP is suggested to be developed to align with the World Bank's Environmental and Social Framework (ESS-10) guidelines and to meet the requirements of the Environment and Social Policy (ESP) of AIIB. The LRIP should include capacity-building measures, such as skill-development training, tailored to the needs of PAPs. The Project Management Unit (PMU) and the Lahore Water and Sanitation Agency (LWASA), with the support of consultants, are responsible for implementing these corrective actions on the agreed timelines to be established in consultation with the PMU to prioritize immediate and high-impact measures.

1 INTRODUCTION

1.1 PROJECT BACKGROUND

Lahore is the capital city of the Punjab Province with a population of about 13 million individuals and is the country's second-most populous city after Karachi. The city is located in the northeastern end of the province, near the international border with the Indian State of Punjab. The major portion of the city lies towards the east and south of the River Ravi, a tributary of the mighty River Indus. The average elevation of the city is 700 ft. above mean sea level (AMSL). The city is situated on the flood plain of the river Ravi which has a gradual slope towards southwest.

Water and Sanitation Agency (LWASA), Lahore, is the subsidiary agency of Lahore Development Authority (LDA), Government of the Punjab, created under Section 10 (2) of the LDA Act, 1975 to perform all functions and exercise all powers with regard to water supply, sewerage and drainage of the city including collection of fees and charges. It is one of the largest water and sanitation utility providers of Pakistan operating in the area of more than 350-Sq. Km and operating and maintaining approximately 600 tube wells, about 5,400 Km of water supply lines, about 4000 km of sewerage network, 16 Major sewage disposal stations and 95 intermediate lift stations.

Currently, all the wastewater generated in Lahore City (domestic and industrial) is being discharged untreated into River Ravi through different discharge points (via disposal stations and drains). An estimated 540 MGD (1000 Cusec) of untreated domestic sewage is being disposed of into River Ravi. Therefore, LWASA has planned to construct Wastewater Treatment Plants (WWTPs) in the city on a priority basis. Due to budgetary limitations, LWASA has arranged financing from Agence Française de Development (AFD) for the construction of a wastewater treatment plant at Babu Sabu. AFD Financing is conditional upon the implementation by the client of continuous and systematic environmental and social assessment procedures.

1.2 OBJECTIVES OF THE PROJECT

The following are the key objectives of the construction of WWTP at Babu Sabu:

- To meet the prevailing environmental standards (Punjab Environmental Quality Standards-PEQS);
- To improve the condition of river Ravi by reducing the pollution load;
- To make treated effluent suitable for reuse for agriculture, after dilution with river water;
- To prevent the spread of diseases resulting from improper disposal of wastewater;
- To prevent and control soil and groundwater pollution.

1.3 EXISTING CONDITIONS

Due to the urban sprawl, Lahore city has faced exponential growth in population. Consequently, the consumption of water and wastewater generation rate has increased significantly. Currently, the wastewater generated is either disposed of in River Ravi or reused for irrigation purposes without any treatment. The disposal of untreated wastewater deteriorates the water quality of the River Ravi and associated aquatic life. In addition, it poses a risk to public health by serving as the breeding ground for disease vectors. The uptake of

the contaminants into the food chain by using raw wastewater for irrigation purposes is another concern.

1.3.1 EXISTING SEWERAGE DISTRICT AREAS OF LAHORE

The existing wastewater collection system of Lahore is a combined system consisting of primary, secondary and tertiary networks. LWASA is also responsible for maintaining Lahore's water supply system and storm water drainage system. Both secondary sewers and storm water drains carry wastewater flows to the river Ravi. In LWASA service area of Lahore, there are twelve (12) Disposal Stations (discharging wastewater flows to either the Ravi River or to primary drains that end up in the Ravi River), four (4) Drainage Pumping Stations and ninety-one (91) Lifting Stations. While the Disposal Stations operate throughout the year, the Drainage Pumping Stations are intended to operate only during the monsoon period, i.e., to pump only the generated storm water flows. However, several sewer pipelines are connected to the storm water drains and, as a consequence, the Drainage Pumping Stations are presently utilized as disposal stations during the wet weather periods. The summary of the existing sewerage district area is given in **Table 1-1**:

Table 1-1: Summary of Existing Sewerage District Areas

Sr. No.	Sewerage District	Area (km^2)	Length of Sewer (km)
1	North East District	29.27	523
2	North District	25.30	532
3	Central District	23.00	256
4	South Civil District	26.69	538
5	South West District	25.51	480
6	South District	218.00	1055
7	South East District	18.82	1.00
8	North West Shahdara District	18.49	240
Total		**385**	**3,725**

1.3.2 SEWERAGE SYSTEM OF BABU SABU AREA

At present, the sewerage catchment of Babu Sabu area is mainly served by six (06) Disposal Stations (DS). The wastewater/sewage, from the pumping stations, is directly discharged to the river Ravi from the following six (06) disposal/drainage stations without any treatment:

I. Main Outfall No. 1-3 Disposal Station
II. Gulshan-e-Ravi Disposal Station
III. Multan Road Disposal Station
IV. Chotta Ravi Drainage Pumping Station
V. Babu Sabu Drainage Pumping Station
VI. Forest Colony Disposal Station

Initially, drainage pumping stations were provided at the end of the main drains of Lahore for purpose of pumping storm water. Currently, these drains receive a huge quantity of the sewage from several lift-stations and drains flow approximately full even in the dry weathers. Conceptual diagram of the arrangement of lift stations; main drains and disposal/drainage pumping stations is given in **Figure 1-1**:

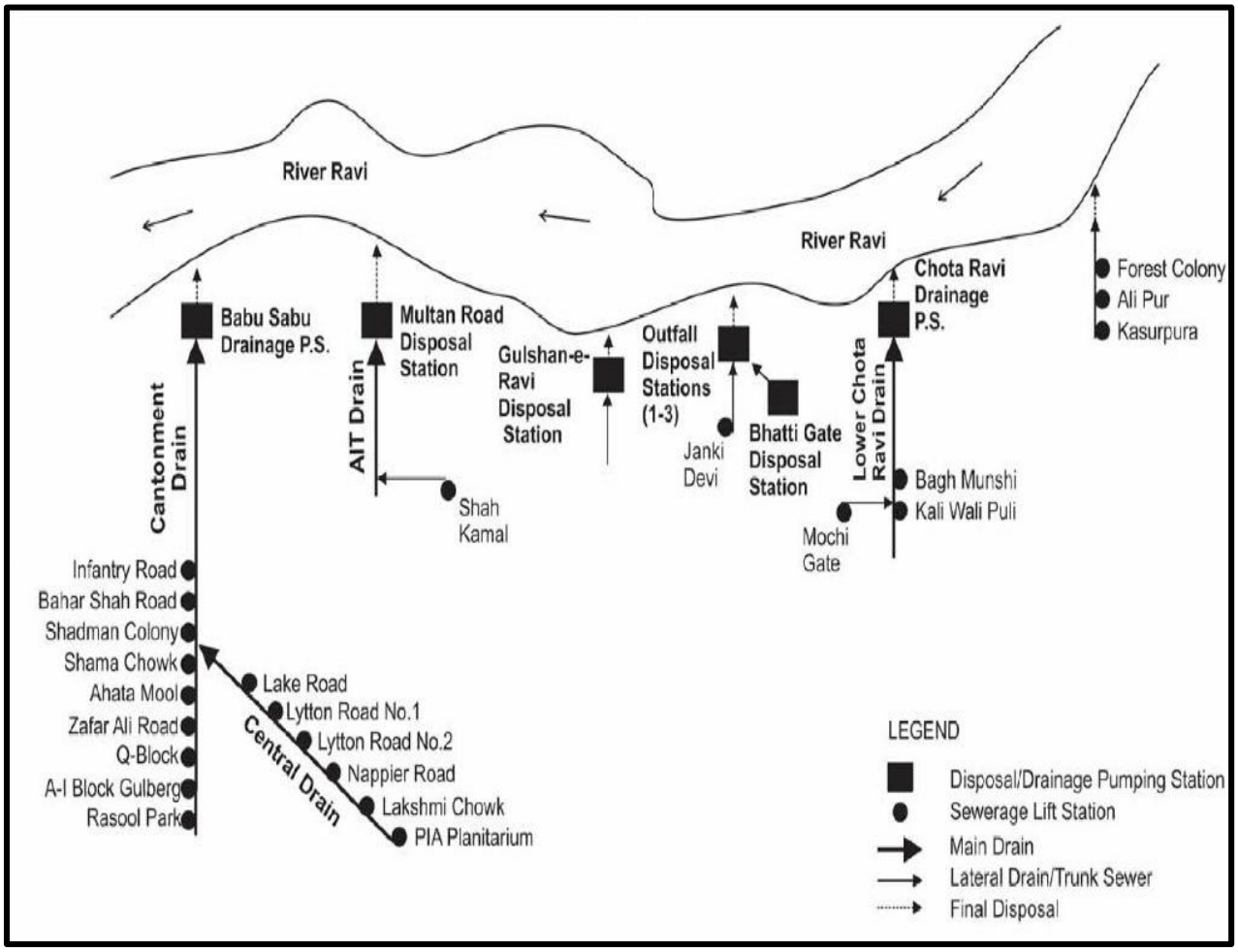


Figure 1-1: Conceptual Diagram of Sewerage System of Babu Sabu

1.4 AIIB POLICIES AND DIRECTIVES

1.4.1 ENVIRONMENTAL AND SOCIAL FRAMEWORK

AIIB recognizes that environmental and social sustainability is a fundamental aspect of achieving development outcomes consistent with its mandate to support infrastructure development and interconnectivity.

- AIIB screens and categorizes each proposed project based on its environmental and social risks and impacts;
- Identifies actions to avoid, minimize, mitigate and/or offset impacts;
- Includes provisions for disclosure of information and public consultation;
- Every project should have Grievance Redress Mechanism (GRM) accessible to the general public/community.

The Environmental and Social Framework approved in 2016 (Amended in February 2019, May 2021 and November 2022) includes an Environmental and Social Policy (ESP), which further includes Environmental and Social Standards (ESSs) and Environmental and Social Exclusion List (ESEL). The key objectives of the ESF are:

- Ensure the environmental and social soundness and sustainability of each project;

- Support integration of environmental and social aspects of projects into the decision-making process by all parties;
- The Environment and Social Framework applies to all projects.

1.4.2 ESS1 (ENVIRONMENTAL AND SOCIAL ASSESSMENT AND MANAGEMENT)

The ESS1 aims to ensure the environmental and social soundness and sustainability of projects and to support the integration of environmental and social considerations into the Project decision-making process and implementation. ESS1 is applicable if the Project is likely to have adverse environmental risks and impacts or social risks and impacts (or both). The scope of the environmental and social assessment and management measures are proportional to the risks and impacts of the Project. ESS1 provides for both quality environmental and social assessment and management of risks and impacts through effective mitigation and monitoring measures during the course of Project implementation. It defines the detailed requirements of the environmental and social assessment to be carried out for any project to be financed by the AIIB.

1.4.3 ESS2 (INVOLUNTARY RESETTLEMENT)

It is applicable if the Project's screening process reveals that the Project would involve Involuntary Resettlement (including Involuntary Resettlement of the recent past or foreseeable future that is directly linked to the Project). Involuntary Resettlement covers physical displacement (relocation, loss of residential land, or loss of shelter) and economic displacement (loss of land or access to land and natural resources; loss of assets or access to assets, income sources, or means of livelihood) as a result of: (a) involuntary acquisition of land; or (b) involuntary restrictions on land use or access to legally designated parks and protected areas. It covers such displacement whether such losses and involuntary restrictions are full or partial, permanent or temporary. The ESS 2 defined detailed requirements of resettlement planning of the projects involving involuntary resettlement.

1.4.4 RATIONALE FOR ESDDR

The objectives of the ESDDR are to independently review and assess the Environmental, Social and Health & Safety status and performance of Project, including all actions taken for the acquisition of land, rehabilitation and resettlement and any other actions related to social impacts, and identify compliance gaps, issues, improvement opportunities, and develop a detailed time-bound mitigation/follow-up/corrective action plan to ensure compliance to applicable local, national and international environmental and social legislation as well as AIIB's Environmental Social Framework (ESF). This typically entails:

1. Assessment & Verification of Project and its key components and aspects vis-à- vis with the requirements of applicable local, national and international environmental and social legislation, AIIB's ESF and good international industry practices (GIIP);
2. Undertaking the ESDD in line with AIIB's ESF requirements, which may, where applicable, include reviewing the adequacy of:
    - The Construction of Wastewater Treatment Project (WWTP) at Babu Sabu is an associated facility to LWASA's project namely "Sewerage System from Laerch Colony to Gulshan-e-Ravi (Through Trenchless Technology)". This project aims to provide a sewerage conveyance system for the collection of wastewaters in central Lahore. The wastewater of this conveyance system will be disposed of ultimately to WWTP Babu Sabu once both projects are constructed.

- The Environmental and Social Impact Assessment (ESIA) process includes the Environmental Impact Assessment (EIA), Social Impact Assessment/Resettlement Plan (SIA/RP) and Environmental and Social Management Plan (ESMP) as appropriate.
- The Environmental and Social Management Systems of the Project to manage E&S risks and impacts on an ongoing basis in accordance with the provisions of the AIIB's ESF. Reviewing whether capacity and management structures are adequate and in place to manage environmental and social risks and impacts.

3. Reviewing the adequacy of proposed designs, measures and budgets, and recommending, where required, additional actions as necessary;
4. Reviewing the proposed monitoring systems and suggesting amendments as necessary;
5. Conducting an assessment of the processes and actions already taken for acquisition of land, rehabilitation and resettlement, and any other actions related to social impacts as against the requirements of applicable local, national and international social legislation, AIIB's ESF and good international industry practices (GIIP), which may wherever applicable, include assessing the adequacy of:
    - Information Disclosure and Consultation
    - Eligibility and Entitlements
    - Compensation for loss of assets due to physical and economic displacement
    - Rehabilitation and resettlement benefits, including livelihood restoration and shifting
    - Relocation of Common Property Resources
    - Health and Safety
    - Grievance Redress Mechanism
    - Support to vulnerable PAPs, including the disabled, and actions for Gender Equality and Social Inclusion
    - Land Clearance
6. Based on the assessment, providing a detailed evaluation of compliance with AIIB's ESF; and
7. Develop a detailed and time-bound Action Plan and Corrective Action Plan with follow-up and implementation plan details, parameters and outcome indicators to judge compliance with AIIB's ESF.

1.5 SCOPE OF ESDDR

The scope of this due diligence includes a review of environmental and social management practices of the construction of the Wastewater Treatment Plant at Babu Sabu. The Due Diligence study reviewed the available documents and assessed the compliance of the environmental and social framework of AIIB with respect to; i) Regulatory clearances/permissions/consents (like environmental clearances, permissions, etc.); ii) Environmental Impact Assessment and integration of environmental management measures in to design; iii) Social Impact Assessment / Resettlement Action Plan; iv) Public consultations and information disclosure; v) Implementation of Environmental and Social Management Plans and Health, Safety and Environment (HSE) Measures; vi) Institutional Arrangements; vii) Field Visit Observations and (viii) Environmental and Social Corrective Actions, etc. The project is in its design phase therefore, the ESDDR is also limited to the design phase.

1.6 APPROACH AND METHODOLOGY FOR ESDDR

The methodology comprised the following steps:

1. Project Literature Review
2. Stakeholder Consultations
3. Analysis of Data/Information Collected
4. Identification of Environmental and Social Risks and Impacts
5. Identification of Environmental and Social management measures
6. Preparation of ESDDR
7. Consultations on Draft Outputs/Corrective Actions
8. Finalization of ESDDR
9. Disclosure of Final ESDDR

Apart from a site visit by the LWASA E&S team, the following documents were reviewed for the preparation of this ESDDR:

- Environmental Impact Assessment (EIA)
- Resettlement Action Plan
- Climate Risk Assessment by GROUPE HUIT

2 PROJECT DESCRIPTION

2.1 PROJECT OVERVIEW

To address the issue of the pollution levels in the Ravi River, LWASA has decided to construct three wastewater treatment plants in Shad Bagh, Shahdara and Babu Sabu. The present study focuses on the Babu Sabu WWTP and conveyance system for phase 1. Babu Sabu Stage 1 (BSS1) project covers the flows until 2035 and will be completed in phase 2 to cover the needs until 2045.

The scope of BSS1 includes the design and construction of a WWTP that would treat the wastewater flow that is already currently conveyed down to the projected WWTP location. This flow includes the outlet of Multan Road DS and Cantonment Drain. It is worth noting that the project does not include any wastewater/drainage collection system. It also does not include any component related to septic tank removal.

The “conveyance” part of BSS1 is limited to the connection of the outlet of Multan Road DS and Cantonment Drain to the WWTP inlet, while the treatment processes to be implemented at the WWTP include:

1) Primary treatment (sedimentation tanks);
2) Secondary treatment (through conventional activated sludge process) for a fraction of the collected flow rate in order to improve the quality of the treated wastewater up to a level to be defined and to introduce the CAS process within LWASA and to pave the way for future extensions; and
3) A sludge digesters and cogeneration unit to produce electricity from sludge digestion.

On the map below (**Figure 2-1**), these components are presented. The Babu Sabu Wastewater Treatment Plant is represented on the left, with the delimitation in red of the land already purchased by LWASA.

The orange lines are the existing drains that will be kept as such or rehabilitated for the project. The city counts 4 drainage pumping stations and 12 sewerage disposal stations, of which two and four will be connected to the BSS1 WWTP. All of them currently serve to evacuate rain and wastewater into the River Ravi without any treatment. The wastewater is produced by domestic and industrial usage and has a BOD estimated at 200 mg/L to 250 mg/L.

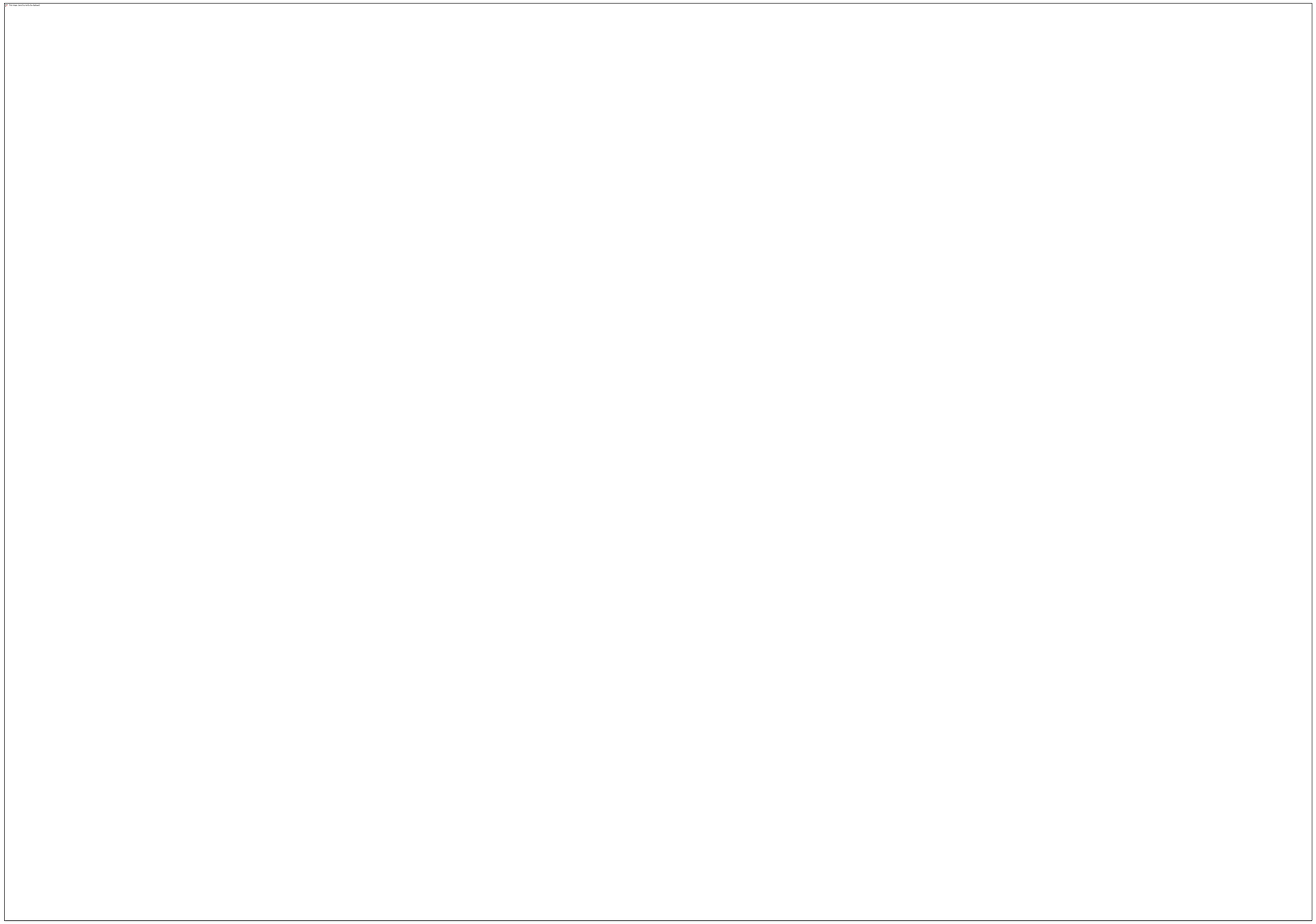


Figure 2-1: Map Detailing Conveyance System of the Project

The proposed wastewater treatment will consist of 50% of the incoming wastewater to be treated in a biological treatment and 50% to be treated with sedimentation only. Two wastewater streams would exist after the primary sedimentation tanks, one going directly to the outlet and the other one going through biological process. The large amounts of sludge from the primary settling tanks and the excess sludge from the CAS process are merged in the gravity thickeners and afterward anaerobically processed in the sludge digesters. The effluent sludge would be stabilized and largely mineralized through the degradation of organic matter. Afterwards, it could be safely applied onto the drying beds.

Conventional Activated Sludge (CAS) is the technology that is proposed to be used at this stage. As per initial design, the Project was made of the following components (**Figure 2-2**):

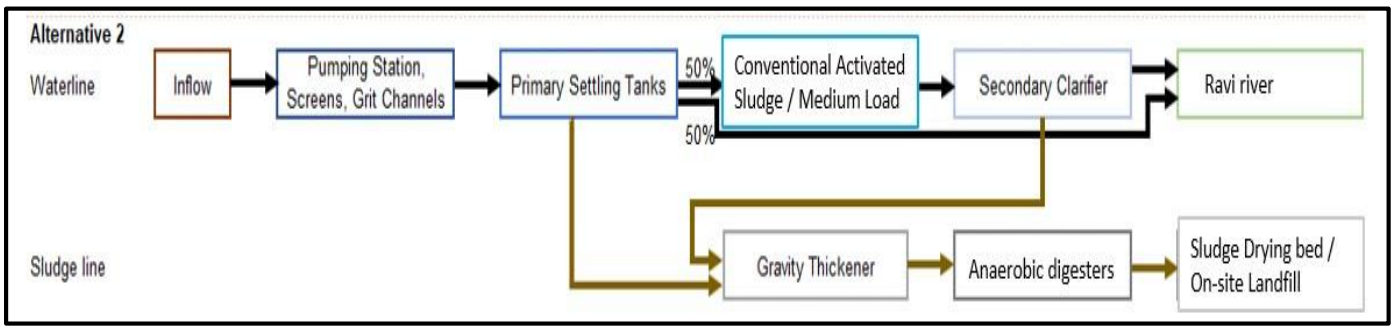


Figure 2-2: Flow diagram of CAS process

2.2 PROJECT COMPONENTS OF WASTEWATER TREATMENT PLANT (WWTP) AT BABU SABU

Construction of Wastewater Treatment Plant (WWTP) at Babu Sabu, Lahore includes the following components:

- Wastewater Treatment Plant including allied structures & buildings
- Construction of Collector Channel from cantonment drain to proposed influent station within WWTP Site and up gradation of Disposal Stations

Component 1: Construction of the conveyance system to transport wastewater from the existing disposal stations or drains to Babu Sabu WWTP, which includes collector channels and force mains and WWTP inlet pumping station and the upgrade of existing Disposal Stations and pumping stations.

Component 2: Construction of Babu Sabu WWTP featuring the conventional activated sludge (CAS) process.

Component 2 was further divided into two phases i.e., Phase-1 (for the year 2020-2035) and Phase 2 (for the year 2036-2045). However, AFD intended to finance only component 2 i.e., construction of wastewater treatment plant. The design was reviewed by AFD experts and decided to further examine the wastewater flows by installing flow measurement gauges and pollution characterization. AFD hired a consultant “Groupe Huit” for this study. The outcomes of the new studies, namely “Babu Sabu Project, Lahore, Pakistan – Complementary Study” led to the preparation of a new PC-1, known as “Babu Sabu Wastewater Project, Stage 1 (BSS1)” Based on the finding of the study, the consultant prepared a conceptual design report. The project details presented in this section are taken from the conceptual design report.

2.3 INTEGRATION OF SEWERAGE SYSTEM THROUGH LARECH COLONY TO GULSHAN E RAVI IN LAHORE (THROUGH TRENCHLESS TECHNOLOGY) INTO WASTEWATER TREATMENT PLANT AT BABU SABU, LAHORE

WASA is planning to treat wastewater of the Lahore City through an independent project titled "Construction of Wastewater Treatment Plant at Babu Sabu," which is currently in the preparatory phase and funded by AFD. For this purpose, WASA has already acquired approximately 836.4 acres of land. Wastewater collected through the state-of-the-art Trunk Sewer Conveyance System (Larech Project) at the Gulshan-e-Ravi Disposal Station will be diverted via a collector channel to the Babu Sabu wastewater treatment plant in phases.

In Phase I, the proposed wastewater treatment plant (WWTP) at Babu Sabu will have a capacity of 164 cusecs (400,000 m³/day) to treat 150 cusecs (367,000 m³/day) of dry weather flow from the Larech Project up to 2035. The expected dry weather flow from this project is 200 cusecs (489,000 m³/day) up to 2050. The additional 50 cusecs (122,000 m³/day) from the Larech Project will be addressed in Phase II of the WWTP project, for which the Babu Sabu WWTP capacity will be increased to 408 cusecs (1,000,000 m³/day). Through both these phases, 100 percent of dry weather flow from Gulshan-e-Ravi will be treated.

Figure 3-4 Design Flow rates for Treatment at WWTP, Babu Sabu

3 ENVIRONMENTAL DUE DILIGENCE

3.1 ENVIRONMENTAL POLICY, LEGAL AND REGULATORY FRAMEWORK

The Environment Impact Assessment has listed several key national and state policies, acts and regulations related to the environment as relevant to the Project.

The EIA provides a comprehensive overview of Pakistan's legal and regulatory framework governing environmental protection, resource conservation, and sustainable development, especially concerning infrastructure and development projects. It highlights key national laws like the Pakistan Penal Code (1860) for addressing environmental offenses, the Pakistan Environmental Protection Act (1997) for regulating pollution and ensuring environmental assessments, and the National Climate Change Policy (2012), which prioritizes climate resilience and integration into development planning. Sect oral guidelines such as wastewater management, solid waste handling, and public consultation emphasize adherence to environmental standards. In the 18th Amendment in Constitution of Pakistan, environment is declared as provincial subject. Punjab government has promulgated Punjab Environment Protection Act (2012) which is applicable for the project.

According to ESF of AIIB; the project falls under category “A” that requires ESIA study (where the project is likely to have significant adverse environmental and social impacts that are irreversible, cumulative, diverse or unprecedented. Similarly, according to IEE/EIA Pakistan Regulation-2022, the proposed project falls under Category “F” (Water Supply, Sewerage System and Treatment) of Schedule-II that requires Environmental Impact assessment (EIA) because proposed project is likely to have adverse impacts on environment.

National Disaster Management Act, 2010 to offer an effective National Disaster Management System and for matters associated therewith or incidental thereto and to overt unforeseen

situations. The act is administered by the federal government which provides guidelines for the provision of Disaster Risk Reduction (DRR) and Disaster Management Plans and offer necessary technical assistance to the Provincial Governments and Provincial Authorities as well for preparing their disaster management plans in case of any mishap. This Act is valid for the subject project in case of any unseen situation.

Land acquisition laws, including the Land Acquisition Act (1894), ensure fair compensation for displaced individuals, while construction laws like the Seismic Building Code (2007) promote structural safety. Labor legislation and child protection laws safeguard worker rights and prohibit child labor. Additionally, cultural preservation laws, such as the Antiquities Act (1975), protect archaeological and historical sites from destruction.

The EIA also discusses Pakistan's commitment to international conventions, such as the Paris Agreement and the Kyoto Protocol, focusing on climate change mitigation, biodiversity conservation, and sustainable development goals. Provincial-level regulations, particularly in Punjab, address localized environmental concerns, including wildlife protection and floodplain management. Overall, the framework ensures environmental safeguards, public health, and sustainable resource management in alignment with national and global standards.

The EIA outlines the environmental and social risk management policies of the Agence Française de Development (AFD) and the World Bank, emphasizing their alignment in addressing potential risks associated with development projects. AFD integrates corporate social responsibility into its governance and operations, requiring thorough assessment and management of environmental and social (E&S) risks. AFD's policy mandates the identification, prevention, mitigation, or offsetting of adverse impacts throughout the project lifecycle, from design to implementation and post-evaluation. Projects are categorized into four risk levels—High, Substantial, Moderate, and Low—based on factors such as project scale, location, and potential impacts. High- and Substantial-risk projects must adhere to the World Bank's Environmental and Social Standards (ESS) and Environmental, Health, and Safety Guidelines (EHSGs).

The World Bank's Environmental and Social Framework (ESF), adopted in 2018, underscores its commitment to sustainable development by providing a comprehensive policy and set of standards to guide project financing. The World Bank also classifies projects into the same four risk categories, with High-risk projects involving severe, long-term, or irreversible impacts, while Low-risk projects have minimal or negligible impacts and typically do not require further E&S assessments. The ESF aims to ensure that projects address potential environmental and social issues effectively, supporting goals of poverty reduction and shared prosperity. For example, the "Babu Sabu" project, categorized as High Risk under AFD's policy, must comply with the World Bank's E&S standards to manage its significant potential impacts. There is more or less no gap identified between the E&S policies of AFD and AIIB.

AFD's financing decision is based on a preliminary analysis of the environmental and social assessment documentation. It involves a detailed Environmental and Social Assessment (ESA) for projects in both the High and Substantial Risks category. It may be in a simplified form for those in the Moderate Risks category. Generally speaking, no environmental and social assessment is required for projects in the Low Risks category.

The objectives and content of the detailed ESA, ESMP and RAP comply with the provisions of the World Bank's Environmental & Social Standard for the Assessment and Management of Environmental and Social Risks and Impacts. For High-Risk operations, the detailed ESA, as well as the related environmental and social management documents will be analyzed and

must be validated by AFD prior to the financing approval. For operations with Substantial or Moderate Risks, the ESA must be available and validated prior to the financing approval. For the three categories, the studies are completed with an Environmental and Social Commitment Plan.

In the context of the follow-up to the 2005 Paris Declaration on Aid Effectiveness and in line with the 2014 Law on the Orientation and Programming Development Policy and International Solidarity, AFD has decided to harmonize the principles of the current Environmental and Social Risk Management Policy and to coordinate its actions with the environmental and social framework of multilateral donors. AFD has therefore aligned its Policy with the World Bank's environmental and social standards for projects with High or Substantial environmental and social impacts. For other operations, the projects must be appraised and implemented in compliance with the prevailing national environmental and social regulations in the country where the operation takes place[1].

3.2 ADMINISTRATIVE FRAMEWORK

3.2.1 WATER AND SANITATION AUTHORITY (LWASA), LAHORE

The implementing agency of the proposed Project is the Water and Sanitation Authority (WASA), Lahore. The management of LWASA will ensure that all the proposed measures are effectively implemented at the design, construction and operational stages. Moreover, LWASA is responsible for ensuring that all preconstruction requisites, such as permits and clearances, are met.

3.2.2 ENVIRONMENTAL PROTECTION AGENCY, PUNJAB

Implementation of Punjab Environmental Protection Act 1997 (Amended 2012 & 2017) 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, Director EIA and others. The Directorate of EIA is further handled by Deputy Director(s) and Assistant Director(s) that look after designated sub-departments. Punjab-EPA has established District Environment Offices at the district level. The Directorate of EIA is overall responsible for evaluation of EIA reports and accord of environmental approvals against the projects submitted. The process includes several stages and steps encompassing preliminary review of submitted IEE/EIA reports by the Assistant Director(s) and Deputy Director(s), followed by the directions to hold Public Hearing, which is duly witnessed and reported back to the agency by Field Assistant Director(s). After the Public Hearing, the submitted case for environmental approval is sent to the Committee of Experts for final review, followed by allotment of environmental approval by the Director General.

3.2.3 DUE DILIGENCE FINDINGS ON LEGAL AND REGULATORY FRAMEWORK

The project area lies in the flood zone declared by the irrigation department. There had been a consultation between the irrigation department and LWASA where the Irrigation official declared that NOC shall be required before the construction of the project. This action point is related to The Punjab Flood Plain Regulation Act, 2016; National Climate Change Policy 2012.

[1] https://www.afd.fr/en/ressources/environmental-and-social-risk-management-policy-afd-funded-operations

No Objection Certificate from the Punjab Environmental Protection Department has been obtained for this project. **Annexure-I**

3.3 PERMISSIONS TO BE OBTAINED – STATUS FROM DUE DILIGENCE

NOC from the Irrigation Department is to be obtained.

3.4 POTENTIAL ENVIRONMENTAL RISK/IMPACTS DURING CONSTRUCTION AND OPERATION

The EIA discusses the anticipated environmental and social impacts of a proposed project which are briefly summarized below.

During the planning and design phase, flooding risks are a significant concern as the project site lies in a floodplain. Floods could damage equipment and disrupt operations, necessitating measures like elevated equipment placement and constructing protective dikes. Climate change impacts, including floods, droughts, and heat waves, are also highlighted. The project may contribute to greenhouse gas emissions through the import of materials and reliance on diesel generators during power outages. Land acquisition and resettlement are other concerns as the acquired land is encroached upon, affecting livelihoods. To address this, compensation plans are under development.

This particular area has been accessible to humans for a long time resulting in low diversity and wildlife abundance, some of the broad-leaved trees exist in the area and these species still survive the onslaught of urbanization. The same may be found in remote barren areas or in graveyards only. There is probably little natural vegetation left in the tract. The natural vegetation of the Lahore region falls under the tropical thorn forest type, but no such designated forest is reported in the project area and has long ago been replaced completely by crops. Floristic study of any given area helps to evaluate the plant wealth and its potential values (Iqbal. z et al 2016). Vegetation of the area shows that the area is suitable for the plantation of native species along the agricultural fields. Variation in diversity is among the tools that are caused due to climate, heterogeneity, biotic interaction and habitat. In the past, the area was covered with a huge amount of ground vegetation and dominated trees but now the conditions are at the adverse side because the original or natural habitat has been modified and converted into barren land for construction and agricultural (fodder) purposes. This particular area has been accessible to humans for a long time resulting in low diversity and wildlife abundance.

Ecologically, the removal of 1,920 trees will disturb local flora and fauna. A compensatory plantation of ten trees for each tree removed is planned. Soil and water quality are at risk due to potential erosion, contamination, and groundwater pollution. Measures such as proper lining, storm water drainage, and sludge management are proposed to mitigate these impacts.

During the construction phase, air quality and noise levels will be affected by dust, emissions, and equipment operations. Dust control measures, vehicle maintenance, and noise shielding are recommended to address these issues. Solid waste from construction activities and camps could harm workers and the environment if not properly managed. Segregation of waste, covered storage, and designated disposal sites are proposed solutions. Increased traffic from construction activities could disrupt local roads, requiring controlled movement and proper signage. The influx of labor may strain local resources and lead to social and cultural conflicts. To mitigate this, local hiring and community engagement are recommended. Health and safety

risks include potential accidents and the spread of diseases. The EIA emphasizes safety training, protective equipment, and emergency response plans to address these concerns.

During the operation phase, sludge management emerges as a critical issue due to the large quantities produced. Proper storage and disposal are essential to prevent contamination. The project is expected to improve surface water quality by treating wastewater but risks of accidental discharges of untreated wastewater exist. To mitigate this, regular monitoring and alternative ponds during maintenance are recommended. Air quality could be affected by emissions from equipment and odors from limited flow, necessitating regular monitoring and proper operation of the plant. Soil quality risks include contamination from improper sludge handling or wastewater spillage. Regular inspection, proper training, and safe disposal are vital measures. Finally, health, safety, and environmental risks during operation include slips, trips, and diseases. A comprehensive emergency response plan is essential to address these issues effectively.

In summary, the report provides a comprehensive evaluation of the project's environmental and social impacts. It emphasizes the importance of implementing mitigation measures to ensure the project adheres to environmental standards and minimizes adverse effects on the surrounding communities and ecosystems.

3.5 ENVIRONMENTAL DUE DILIGENCE

Environmental Due Diligence has been carried out by reviewing the EIA of WWTP Babu Sabu, discussions with the WWTP Environment and Social Team, and a site visit of the WWTP Babu Sabu site along with the WWTP team. The site visit was conducted to make visual observations. It was seen that there was plenty of land available. Currently, it is unutilized and covered mostly with grass and shrubs, besides the cultivation of crops by the farmers. WWTP's first phase is planned on a site that is free of encumbrance. The site is bounded by a brick fence, and it is under the possession of LWASA.

3.5.1 POTENTIAL ENVIRONMENT RISKS/IMPACTS DURING CONSTRUCTION AND OPERATION PHASES

The project is located in the River Ravi floodplain. The PMU deployed M/S Groupe Huit Consultants to conduct a detailed flood study and recommend the safest location for the project. The flood modeling was done with the GEOHECRAS 2D software that was used to set up a fully 2D model for River Ravi including the river as well as the WWTP and the conveyance system. The hydraulic modeling of Ravi flooding and its interaction with the WWTP and the conveyance system was done on the 25-, 50-, and 100-year flood events that served as forcing hydraulic loads and were of approximately 2115, 2500, and 2830 m^3/s, respectively.

There could be a few more potential risks which were assessed during field visit Survey i.e.: what happens if during operation the plant gets dysfunctional? What kind of bypass is available for this situation? For how long can the wastewater be held? What kind of impacts will it have etc.? These questions have been responded to by PMU, Babu Sabu team.

When the plant operation gets dysfunctional, it means there is no treatment of incoming sewage or disturbance of effluent quality. An effect, Cause, and Mitigation/Remedy chart will be provided during plant commissioning and operation to rectify any unwanted situation that comes into the WWTP's normal process. Second, bypass channels are provided to divert the incoming sewage directly to the Ravi River.

RCC Channel and flow by gravity for influent (incoming sewage) is available to bypass the influent to Ravi River. Regarding WWTP Babu Sabu, the Conventional Activated Sludge process is based on the continuous flow of incoming sewage for treatment and each component of WWTP has its own retention time to treat the sewage. In biological treatment, an aeration tank & secondary clarifier are required to continue to flow with food (microorganisms) for treatment on average daily flows.

In case the plant operation gets dysfunctional, and remains unresolved for a longer period (which is highly unlikely with proper implementation of the Effect, Cause, and Mitigation/Remedy chart), the project area may revert to the pre-project situations. Climate risk Assessment study has been conducted by the French Consultant in 2022-23.

With the data obtained through modeling the report marks a suitable area for the construction of the plant which is non-flood-prone and does not require dikes or embankments. However, caution needs to be exercised, and the Irrigation department needs to be onboard from the design phase.

The risks associated with labor influx have been outlined in the EIA, however, risks associated with GBV, sexual exploitation abuse (SEA) and sexual harassment (SH) need to be addressed in the document. Furthermore, mitigation measures to address these risks need to be incorporated in the document.

3.5.2 ENVIRONMENTAL MITIGATION PLAN

The EIA contains EMP and the sludge management has been covered in EIA. A few more suggestions are given below: The sludge after some lab tests can be considered for use to grow fodder, or it can be used for horticulture and forestry. The sludge can also be used to construct a spur to protect the project site from flooding. The LWASA project of the Trenchless Trunk Sewer will also produce a large amount of slurry which can be used for the construction of this spur.

3.6 BASELINE DATA

3.6.1 PHYSICAL ENVIRONMENT

The topography of the project area is flat. The General height of the area is approximately 220 meters above the Mean Sea Level (MSL). The Lahore district is divided into two parts. The low-lying alluvial soil is along the Ravi River, where the project is located and the upland in the east.

The project area has an extreme climate. It has hot summers and cold winters. The summer starts in April and lasts till September. May, June, and July are the hottest months. The mean maximum and minimum temperature ranges from 40.4 ºC and 27.3 ºC respectively for these months. The winter season lasts from November to March. December, January and February are the coldest months. The mean maximum and mean minimum temperature ranges from 21.1ºC to 7.2 ºC in January. The study area forms the upper part of the Punjab plain, which is a part of the Indo-Gangetic depression. This depression is of a synclinal nature. Synclinal depression is a fore-deep downward of the Himalayan foreland of variable depth, converted into flat plains by the simple process of alluvial deposition.

In Lahore, 76 collecting drains are connected to eight major drains including Sattukatla Drain, Mian Mir Drain, Lakshmi Drain, Suk Nehar Drain, Upper Chotta Ravi Drain, Lower Chotta Ravi Drain, Siddique Pura Drain, and Shahdra Drain, which discharge polluted water into Hudyara

drain. Hudyara Drain ultimately discharges into River Ravi. The effluent from the proposed WWTP is proposed to be discharged in the cantonment drain. Currently, untreated wastewater is being discharged into the cantonment drain which ultimately discharges wastewater into River Ravi. River Ravi is almost a dying river as the construction of the Thein dam and flow diversion at Madhopur in India has drastically reduced the river flows. The river flows drop to almost zero in winter and may rise as high as 17,000 m3 sec-1 during monsoon floods in summer.

Environmentally sensitive receptors were identified during site visits. Sensitive receptors include Educational Institute (Schools & Mudrasa), Mosque, Shahmsham Ghatt, Shrine and Graveyard. Environmental monitoring for ambient air and noise levels was conducted at the WWTP site, Multan Road Disposal Station Sabzazar and Saggian Wala Bypass Road. Samples of surface water were taken from river Ravi while for drinking water, samples were taken from Shadiwal, Jhugian Nagra, Multan Road Disposal Station Sabzazar and Saggian Wala Bypass Road. Wastewater samples were taken from Multan Road Disposal Station Sabzazar, Saggian Wala Bypass Road and Cantonment drain near the WWTP effluent discharge point. All the test results have been compared with the stringent value from PEQS 2016 and WB/IFC limits. Ambient Air monitoring results show that all the parameters were within the permissible limits except Sulphur Dioxide (SO2) at all four locations, particular matter (PM10) and particular matter (PM2.5) at all four locations, which is higher than the limits of WB/IFC standards.

Carbon Monoxide (CO) was found to be higher than the PEQS 2016 limits at the Saggian Wala bypass road. The main causes of high values of Sulfur Dioxide, Particulate matter & Carbon Monoxide are industrial activities in nearby areas and inefficient burning of fuel in vehicles that use substandard fuel as well as require maintenance. The surface water monitoring test results have been compared with PEQS 2016 and WHO Class V. The results show that the value of pH is higher than the WHO Class V. The results also show the presence of total Coliform, Fecal Coliform & E. coli. The addition of chemicals and pollutants in the river Ravi is responsible for high pH values. The positive bacterial values are due to the discharge of wastewater effluents into River Ravi. The drinking water test results have been compared with the stringent values from PEQS 2016 and WHO standards. The test results show that all the parameters were within the permissible limits except the arsenic value at all three locations (compared with WHO standards). Biological contamination was found at Shadiwal and Jhugian Nagra. At Shadiwal and Jhugian Nagra, groundwater samples were collected from hand pumps which may be at shallow depths and some sewage portions may be mixed at this depth. The remaining samples were taken from tap water which comes from municipal water supply pipelines.

The wastewater monitoring test results have been compared with PEQS 2016 and IFC standards. All samples had high organic contamination with chemical oxygen demand and biological oxygen demand values higher than PEQS and IFC standards. TSS value was higher at all the locations as compared to IFC standards. However, as compared to PEQS, it was higher at one point i.e., Cantonment Drain. This may be due to the addition of sewage waste, industrial wastewater as well as other multiple sources of toxic water pollutants being dumped into water canals which end up in River Ravi.

3.6.2 ECOLOGICAL ENVIRONMENT

As the climate of Lahore is semi-arid and subtropical, the vegetation of the area falls under scrub, dry, tropical thorn forest type as per phytogeographical classification of the area.

Dharek, Mesquite, Ber, Khabbal, Aak, Mulberry, Shisham, Banyan/ Bohr, Sukh chain, Jamun, Poplar Parkinsonia, Paper mulberry, Aak are natural flora found in the project area. Commonly found fauna found in the project area include Jackal, Porcupine, Squirrel, Mouse, Mongoose. No terrestrial endangered species of flora and fauna listed under IUCN and local/ Pakistan list of endangered/ threatened/ near threatened categories are found in the project area. In the project area, no protected areas and forests are reported. The 'Shadhanwali Forest Reserve-3' is the closest sensitive area which is around 04 km away from the project area. The River Ravi receives wastewater from various drains including the Hydiara Drain which discharges industrial wastewater. Higher concentrations of metals found in the water and plankton samples collected from the river Ravi and its tributaries receiving wastewater discharges of industries and urban areas have adversely affected the Phyto and zooplankton genera residing in metal-polluted ecosystems. However, in effluent received at Babu Sabu, the concentration of metal was not high as evident from wastewater monitoring results.

3.6.3 BASELINE DUE DILIGENCE

The report constitutes a chapter on the environmental and social baseline. It comprehensively covers the area.

3.7 EMP BUDGET

EMP budget has been envisaged in the EIA to cover costs of E&S staff, training, monitoring, health and safety and tree plantation. No Additional cost is required for the implementation of this ESDDR. The costs are given in Table 3-1 below:

Table 3-1: EMP Budget

Sr. No.	Items	Cost (PKR)
1.	Cost of Hiring Staff by SC for Supervision of EMP	40,425,000
2.	Cost of environmental and social training	11,390,000
3.	Environmental and Social Monitoring Cost	2,300,000
4.	Cost of Health and Safety and miscellaneous items	19,332,000
5.	Cost of Tree Plantation	97,438,000
6.	Contingencies (5%)	14,251,750
Total Cost		**299,286,750**

3.8 EMP BUDGET DUE DILIGENCE

The EMP implementation budget is broadly assessed in the EIA. The itemized budget can be more useful for implementation purposes.

4 SOCIAL DUE DILIGENCE

4.1 SCOPE OF SOCIAL DUE DILIGENCE

Lahore Water and Sanitation Agency (LWASA) has planned to construct Wastewater Treatment Plants (WWTPs) for the disposal of treated wastewater in River Ravi. One such plant is planned to be constructed in Babu Sabu. The construction of this WWTP consists of the following components:

- A wastewater treatment plant, including allied structures and buildings.

- A conveyance system, to transport sewage from existing disposal stations/ drains to the proposed WWTP site, by constructing collector channels/ forced mains and upgrading existing disposal stations.

The WWTP and conveyance system construction is planned in two phases: phase one is covered by the present project and named BSS1 (Babu Sabu Stage 1) while BSS2 stands for Babu Sabu Stage 2 which will be constructed as the second phase. BSS1 aims at treating the expected sewage flow until 2035, and BSS2 will expand it to meet the expected needs until 2045. BSS1 WWTP will have a total capacity of 400,000m3/day and a peak flow capacity of 25,000m3/hrs. to serve 1,905,400 population. BSS2 will upgrade it to serve approximately 2,188,500 population.

A preliminary Resettlement Action Plan (RAP) for WWTP Babu Sabu has been prepared in compliance with the rules and regulations of the Government of Punjab, the World Bank's Environmental and Social Standard 5 (ESS-5) and Agence Française de Development (AFD) standards on involuntary resettlements. The RAP's primary objective is to address the adverse involuntary resettlement, and livelihood impacts of the proposed project, plan measures, mitigate losses and determine compensation for these losses. This RAP covers only the first phase of the project and only the wastewater treatment plant and its allied structure and buildings. The RAP does not cover the conveyance system since this work involves rehabilitation and extension at the existing pumping station locations along the cantonment drain not impacting any public or private structure or business.

LWASA has been initiating a project namely "Sewerage System for Larech Colony to Gulshan-e-Ravi through trenchless technology. The scope of social due diligence of WWTP Babu Sabu aims to assess land acquisition and resettlement impacts of the project determined in RAP of the project as the associated facility of LWASA's sewerage project. The assessment is made by extracting information from the RAP of WWTP Babu Sabu, findings of the discussions with staff of PMU-LWASA for WWTP and the joint visit of the proposed site of WWTP Babu Sabu. The findings of social due diligence are presented in the ensuing paragraphs.

4.2 PRESENT STATUS OF LAND ACQUISITION AND RESETTLEMENT

WWTP Babu Sabu involves the use of 836.4 acres of land, which was acquired by LWASA in 1996. Although the land is officially under the possession of LWASA, it is still used for farming activities. The land was acquired under the Land Acquisition Act 1894 (LAA). The compensation was provided, as per the assessment of the Revenue Department. Some of the landowners did not accept these rates and asked for legal remedy. There have been nine court cases lodged in different courts which have been pending to be settled for the last twenty years or so. The resolution of these cases may take longer time. Considering this fact, LWASA planned to execute the WWTP project on the non-litigated acquired land.

The acquired land is not free of encumbrance since farmers have grown crops on the land. They also have structures and other assets on this land. The impact assessment carried out for RAP focused on the assessment of livelihoods affected by this current land use. A detailed inventory of losses (IOL) was compiled through a social impact assessment and census survey. The impacts are identified, and compensations thereof are determined. The study aimed to identify all PAPs and document the impacts on their assets and livelihoods, yet a complete survey of all PAPs could not be conducted as several PAPs refused to participate or were unreachable during the survey. PAPs were classified into four main categories based on their roles in land use:

- User Owners: Informal owners who cultivate the land, rear livestock, or construct temporary structures without recognized legal rights.
- Renters: Individuals who receive rent from others for land use but do not cultivate the land themselves.
- Tenants: Those who lease land for self-cultivation or other uses, paying rent to renters.
- Employees: Workers hired by cultivators to assist with farming or livestock management, compensated through wages or crop shares.

The study estimated that the project would affect 730 acres of cultivated land, with green fodder and vegetables being the primary crops grown. Of this, 397 acres were surveyed. The assessment identifies 82 PAPs in total, including landowners, tenants, renters, and employees. Of these, 43 PAPs were identified in the surveyed area, comprising 17 user-owners, 3 tenants, 5 renters, and 18 employees, while 39 PAPs were projected for the un-surveyed area, including 15 user-owners, 3 tenants, 5 renters, and 16 employees. Vulnerable groups, including economically disadvantaged individuals, landless, disabled persons, elderly individuals, and female-headed households, were also identified. A total of 6 vulnerable PAPs were reported, with provisions to compensate additional vulnerable PAPs identified during the implementation phase. Furthermore, 36 PAPs are classified as severely impacted, as they will lose over 10% of their income-generating assets, primarily agricultural land. Furthermore, 2,706 trees will be removed (replenishment envisaged in ESIA) and 39 electric poles will be relocated in coordination with concerned government agencies.

To mitigate the livelihood impacts, the RAP includes compensations for renters through livelihood disturbance allowances and the implementation of vocational training and capacity-building programs for affected households. These measures aim to restore and enhance the livelihoods of PAPs in a sustainable manner. Additional allowances will be provided for employment loss, severity of impacts, and vulnerable PAPs to ensure equitable support.

The study for RAP though aimed to identify all PAPs and document the impacts on their assets and livelihoods, yet a complete survey of all PAPs could not be conducted as several PAPs refused to participate or were unreachable during the survey. This limitation is tackled by making projections of impacts for un-surveyed PAPs. The updating of RAP hence is required for the assessment of impacts on un-surveyed PAPs.

4.3 LEGAL AND REGULATORY REQUIREMENTS

Legal frameworks and policies governing the land acquisition, resettlement, and associated impacts for Babu Sabu Wastewater Treatment Plant (WWTP) contain an evaluation of national laws, particularly the Land Acquisition Act (LAA) of 1894, against international standards such as the World Bank's Environmental and Social Standard 5 (ESS5). This comparison identifies gaps and offers recommendations to align local practices with global best practices.

The Land Acquisition Act (LAA) of 1894, which governs land acquisition in Pakistan highlights its key sections related to the notification, acquisition, and compensation processes. The Act compensates only those with legal ownership or recognized tenancy and does not address losses faced by informal users or provide specific measures for livelihood restoration. Compensation under the LAA is generally based on the market value of the land, with an additional 15% for compulsory acquisition, but it lacks provisions for social impact assessments, grievance redress mechanisms, or assistance to vulnerable groups. Conversely, the World Bank's ESS5 emphasizes avoiding involuntary resettlement wherever possible and provides a framework to mitigate its adverse impacts where unavoidable. ESS5

mandates compensation at full replacement cost and ensures that displaced persons' livelihoods are restored to pre-displacement levels. It also requires robust social impact assessments, consultations with affected communities, and the inclusion of non-titleholders and vulnerable groups in the resettlement process. Specific provisions include livelihood improvement programs, gender-sensitive measures, and mechanisms to address grievances effectively.

Key gaps identified between LAA and ESS5 include the absence of provisions in LAA for non-titleholders, informal settlers, and vulnerable groups. The national law lacks requirements for socio-economic surveys, detailed resettlement plans, or livelihood restoration programs. Additionally, compensation under LAA often falls short of the replacement cost due to deductions for depreciation or administrative fees. To address these disparities, the document recommends aligning practices with ESS5 requirements. This includes conducting socio-economic surveys, compensating all affected persons (including non-titleholders), and ensuring the preparation and implementation of Resettlement Action Plans (RAPs). Vulnerable groups, such as the poor, landless, elderly, female-headed households, and others, will receive additional support to prevent impoverishment. The reconciliation of legal conflicts is considered through measures such as escrow accounts for unresolved compensation cases and ensuring compliance with international standards for AFD-funded projects. For vulnerable groups, the RAP integrates livelihood restoration programs, income generation activities, and other measures to mitigate adverse impacts. The legal framework outlined in RAP is a comprehensive framework harmonizing national laws with international standards, ensuring equitable and sustainable outcomes for affected populations while enabling project implementation.

The legal framework given in RAP for WWTP Babu Sabu is silent about ESS-10; Stakeholder Engagement and Information Disclosure. Considering the stake of other government agencies in the project such as of LWASA's other projects, Lahore Development Authority (LDA), Revenue Department, Irrigation Department, Ravi Urban Development Authority (RUDA), Environmental Protection Agency (EPA), National Transmission and Dispatch Company (NTDC), Lahore Electric Supply Company (LESCO), Non-governmental entities and civic bodies, a Stakeholder Engagement Plan (SEP) is recommended to be prepared for the project as standalone document.

4.4 SOCIO-ECONOMIC PROFILE

The socio-economic profile of directly affected PAPs is made part of the RAP. This profile underscores key demographic and economic characteristics. The project area, situated in Lahore district, houses a predominantly male population (52%), with an average household size of 7.5. Punjabi is the primary language, and the community is ethnically diverse, with major groups including Arain, Khokhar, and Sindu. Education levels are low, with 47% illiteracy, and the majority engage in farming and livestock rearing. Income levels vary, with 22% of households earning below the poverty line of PKR 32,000 per month. Most PAPs (93%) own their homes, all of which are of pacca construction.

Civic amenities in the project area are relatively developed, with electricity available to all PAPs, natural gas to 85%, and water supply to 73%. However, only 48% have access to a sewerage system. The main sources of drinking water include public supply, hand pumps, and filtration plants, though 53% of respondents are dissatisfied with water quality. These findings emphasize the need for targeted interventions to improve living standards and address socio-economic vulnerabilities in the project area.

The socio-economic data of 52% PAPs could be obtained and presented in RAP. This doesn't represent the socio-economic status of the entire PAPs. The socio-economic data of all PAPs need to be obtained and made part of the updated RAP. The references such as of poverty line and other significant statistics need to be updated as per present-day official statistics.

4.5 RAP IMPLEMENTATION

RAP's implementation is scheduled to be completed in two years. This involves updating the RAP based on a new census and civil work requirements before implementation. Once the updated RAP is approved by AFD, compensation will be paid to all PAPs following the guidelines set in the Entitlement Matrix (EM). Civil works by contractors will not begin until the RAP has been implemented, which includes full compensation payments and the initiation of Livelihood Restoration and Improvement Programs (LRIP). The RAP implementation also includes a grievance redress mechanism that will be operationalized along with consultations and information dissemination. A project account will be opened, and compensation costs will be released and deposited into the account. Notices for submitting claims will be issued, followed by the disbursement of compensation, award of the civil work contract, and handing over of the site for the commencement of works. Throughout the implementation cycle, internal monitoring will be conducted monthly, with reports consolidated quarterly into standard supervision reports submitted to AFD.

An external third party will monitor and evaluate the process throughout its entirety. The Monitoring and Evaluation (M&E) system is designed to continually collect, collate, and analyze information regarding the progress of RAP implementation. This system helps identify strengths and weaknesses in the process, allowing for corrective actions to address deficiencies, policy inadequacies, procedural weaknesses, and institutional drawbacks. The overall goal is to ensure that the socio-economic situation of the affected population is restored to at least its previous levels, verifying that all physical inputs and services committed in the RAP are delivered as intended.

The RAP implementation process outlined in RAP of WWTP Babu Sabu is well elaborated. The process largely depends on RAP updating, timely payment of compensation and effective monitoring of the process. The implementation process can be improved further in the light of updated RAP.

4.6 LIVELIHOOD RESTORATION AND IMPROVEMENT PLAN

The Livelihood Restoration and Improvement Plan (LRIP) has been made part of the RAP. This plan outlines measures to support individuals and households adversely affected by a project. It primarily addresses Project Affected Persons (PAPs) and Affected Households (AHs), focusing on restoring and improving livelihoods to at least pre-project levels, with special attention to vulnerable groups. The LRIP adheres to core principles such as minimizing resettlement impacts, restoring livelihoods, and improving living standards for vulnerable groups. Activities are context-specific, affordable, and tailored to the needs of PAPs, with the flexibility to adapt based on feedback and evolving project conditions.

Compensation measures are outlined in an entitlement matrix addressing various forms of losses including monetary compensation based on market rates and average yield, with provisions for severity and vulnerability allowances, compensation for permanent income loss based on a three-month minimum wage allowance and livelihood improvement measures, such as employment opportunities and training, compensation for affected structures at full

replacement cost, with the right to salvage materials, special provisions for vulnerable PAPs in the shape of subsistence allowances and priority in employment and training.

The plan provides compensation for direct and indirect impacts, prioritizing income restoration and capacity-building activities. Affected individuals and households actively participate in decision-making regarding livelihood restoration activities. Gender-focused measures include training in agriculture and small business management, awareness campaigns, and assistance with agricultural inputs. PAPs are given preferential access to construction and project-related jobs. Contractors are required to hire local workers, including women, ensuring equitable job distribution. Vocational training programs are provided with options for starting small businesses.

The LRIP outlined measures for livelihood restorations encompassing assistance to PAPs and capacity building. However, more specific measures in terms of capacity building with a training plan based on training need assessment of PAPs and exploring options of training specifically skill development training from reputable training institutes can be envisaged with a backup plan for income generating options. Transparency and disclosure are critical, ensuring all stakeholders are informed of eligibility, entitlements, and program details. Monitoring and evaluation are integral, using baseline surveys to measure progress.

4.7 ELIGIBILITY AND ENTITLEMENT MATRIX

All PAPs directly or indirectly affected will be entitled to compensation at replacement cost for loss of crops and livelihood. In order to be eligible for compensation, they need to have been working on the land from before the cut-off date, set at the 30th of June 2023. As the RAP will need to be updated, a complementary census will be conducted, and it will be important to cross-check the information provided during that census with neighbors or influential members of the community to ensure nobody has infiltrated the process since the 30th of June 2023.

Identified PAPs will receive compensation against loss of crops and livelihood assistance. In this project, land acquisition is not involved, only permanent income losses will occur during the project implementation, for which compensation will be paid as per the relevant policies.

The categories of PAPs identified are:

- **User Owners** are informal owners of the land (have no recognizable legal right to the land) who use the land, for example for self-cultivation, for their own livestock, or built structures.
- **Renters** are informal owners of the land (have no recognizable legal right to the land) who receive money from other people using their land.
- **Tenants** pay money to a renter to use the land.
- The **employees** are those who have been hired to assist cultivators to cultivate their land, look after their cattle and get a salary for that work.

These PAPs will be entitled to compensation for the loss of their livelihood, in addition to benefiting from training for one member per affected household as part of the LRIP. Moreover, one-time lump sum assistance to vulnerable households (i.e. (i) female-headed households; (ii) disabled-headed households; (iii) child-headed households; (iv) households falling under the generally accepted indicator for poverty; (v) elderly-headed households with no means of support and landlessness) will provide additional compensation to all vulnerable PAPs including non-title holders as mentioned in the Entitlement Matrix. Among the surveyed PAPs, there are only low-income vulnerable.

The entitlements are defined well in the RAP. However, these entitlements need firming up by including the impacts to be determined in the updated RAP. The rates applied in the entitlement matrix also need updating as per present-day official rates

4.8 RAP BUDGET

The budget for the resettlement and livelihood restoration is estimated at PKR 161.69 million (~€553,957) in RAP of WWTP Babu Sabu. This includes PKR 82.67 million for crop compensation, across both surveyed and un-surveyed areas and PKR 18.315 million for resettlement allowances such as employment loss and vulnerability allowances. Vocational training programs for livelihood restoration are allocated PKR 7.68 million. Administrative costs, including inflation adjustments (11.8%), monitoring, administration, and contingencies, amount to PKR 53.02 million. The cost for the LRIP is estimated at PKR 25.20 million. Additional calculated costs pertain to RAP complementary surveys and updates, which include an allocated budget for surveys that need to be carried out to identify all PAPs. Contingency costs have been set at 20% to account for potential cost escalations during the project and any unforeseen impacts that might arise during the update and implementation of the RAP. This precaution is justified due to un-surveyed areas and unresolved court cases that could influence compensation and the project's ability to pay.

4.9 INFORMATION DISCLOSURE AND CONSULTATION

4.9.1 SOCIAL

RAP provided details of consultations held with PAPs and other relevant stakeholders including information dissemination to them on the project, issues/comments raised and the responses to the comments. Major concerns raised included a lack of social facilities, water and sanitation services, and resettlement issues. Certain concerns such as the potential decrease in property value due to the construction of a plant were noted. Measures to minimize impacts, such as odor management and visual impact reduction through green areas, were discussed. The consultation with the project's stakeholders mainly focused on the resettlement requirements, valuation and compensation mechanism, timely completion of civil works, impacts during construction work, and provision of adequate time for relocation. The information related to the Project, it's possible impacts, mitigation measures, and entitlements including the grievance redress mechanism was shared with the participants during these consultation meetings.

Consultations with secondary stakeholders like NGOs, government departments, and utility departments were conducted separately from primary stakeholders but included invitations to the main project consultations as well. Disclosure of the RAP will occur on relevant websites and at construction site offices established by WASA, Supervision Consultant, Contractor, among other appropriate locations.

Furthermore, a Project Information Brochure (PIB) will be prepared once the Resettlement Action Plan (RAP) is updated. This brochure will disclose public information about the resettlement process, including details about the project, the resettlement process, the Grievance Redress Mechanism (GRM), the schedule, and a complaint form. This RAP, following approval, will be translated and distributed among the PAPs and disclosed on LWASA and AFD websites.

The consultations with PAPs and representatives of government and nongovernment entities are made part of RAP. Activities for future consultation are also provided. However,

considering that LWASA has to coordinate with several government departments during project execution, stakeholder engagement needs to be focused. A Stakeholder Engagement Plan (SEP) is made part of EIA. However, it is suggested to prepare SEP for the project as a standalone document. Special engagement efforts are required for vulnerable groups, which are persons who may be disproportionately impacted or further disadvantaged these efforts are necessary to ensure their equal representation in the consultation and decision-making process associated with the Project.

4.9.2 ENVIRONMENTAL

The EIA emphasizes the critical role of public involvement in environmental-social assessments to ensure better decision-making and smoother project implementation. Public participation fosters transparency, community support, and stakeholder ownership, ultimately leading to improved project design and social acceptability. Stakeholder consultation was conducted with specific objectives, including engaging local residents, sharing project details, addressing concerns, and minimizing conflicts. The process aimed to promote openness, dialogue, and inclusivity while ensuring that stakeholders' perspectives were incorporated into project planning and execution.

The regulatory framework for public consultations includes both national and international guidelines. National laws, such as the IEE/EIA Regulations 2022 and the 1997 Public Consultation Guidelines, mandate transparency, inclusiveness, and stakeholder engagement throughout the project lifecycle. International agencies like the Agence Française de Development (AFD) and the World Bank also provide guidelines to manage environmental and social risks through early and comprehensive stakeholder engagement. These principles emphasize cultural sensitivity, equitable representation, and the provision of timely and relevant information to all stakeholders.

The consultation process was carried out in 2019 and updated in 2021, employing various methods like scoping sessions, formal and informal meetings, focus group discussions, and interviews. Stakeholders were categorized as primary (directly affected individuals and communities) and secondary (government departments, contractors, NGOs, and others with indirect stakes). Key concerns raised during consultations included potential inconvenience during construction, dust and noise pollution, compensation for land and agricultural losses, employment opportunities, and trust issues with local authorities. Responses to these concerns included measures like dust control, noise barriers, fair compensation mechanisms, and prioritizing local hiring to address economic concerns.

Gender consultations were conducted to understand the specific challenges faced by women. Issues such as lack of clean drinking water, inadequate healthcare, insufficient educational facilities, and concerns over mobility due to construction activities were highlighted. Measures were proposed to address these issues, including equitable employment practices, anti-harassment policies, and ensuring that women's needs and perspectives were integrated into project planning.

Secondary stakeholders, including government departments like Irrigation, EPA, Health, and Agriculture, raised technical and environmental concerns. These included the need for NOCs, odor control measures, preservation of green cover, and compensation for agricultural impacts. The responses involved planning mitigation measures and communicating these concerns to the relevant authorities for further action.

The EIA outlines a plan for ongoing consultations and information disclosure throughout the project's lifecycle. Future consultations will involve periodic meetings with communities and stakeholders during the construction and operational phases. Public hearings will be advertised to gather feedback, and efforts will be made to address concerns raised during these sessions. The final Environmental and Social Impact Assessment (ESIA) report will be shared with stakeholders and made publicly accessible, including summaries in the national language, to ensure continued transparency and accountability.

4.10 PUBLIC CONSULTATION

The Public consultation has been carried out according to local laws, AFD and World Bank's Guidelines. EIA adequately covers all sections of the general public, project affectees, public departments and gender. The sample size could have been statistically established; the present study seems to be lacking in this regard. The Stakeholder Engagement Plan (SEP) is made part of EIA. However, to continuously engage the stakeholders during all the activities and project stages with specific roles, SEP can further be improved. It is suggested to make SEP as a standalone document.

4.11 GRIEVANCE REDRESS MECHANISM

4.11.1 SOCIAL

The Grievance Redress Mechanism (GRM) outlined in RAP provides a structured approach to addressing grievances and complaints raised by Project Affected People (PAPs) or community members during the implementation of the project. The mechanism is grounded in principles of fairness, transparency, and prompt resolution. The primary goal is to resolve grievances without retribution against the complainants. The GRM also aims to promote public trust and confidence in the project by ensuring that all concerns are addressed systematically and efficiently. The mechanism has not yet been notified. It is planned to be notified in implementation stage.

The GRM employs a three-tier system to manage grievances. Tier 1, the Community Grievance Redress Committee (Community GRC), operates at the community level. It provides a platform for PAPs and community members to raise concerns and address issues collaboratively with project representatives. This committee, comprising members of the Environment & Social (E&S) team, contractors, affected persons, and community representatives, is responsible for resolving grievances within five working days. Unresolved issues at this level are escalated to the next tier.

Tier 2, the Project Site GRC, handles grievances that cannot be resolved at the community level. This committee includes the Project Director, E&S specialists, and local administration representatives, among others. It reviews complaints, categorizes and prioritizes issues, and seeks to resolve them within seven working days. The committee documents its decisions, communicates them to stakeholders, and escalates unresolved cases to Tier 3. This final tier, the PMU-GRC (Project Management Unit Grievance Redress Committee), addresses the most complex and unresolved grievances. Comprising senior project management, including the Managing and Deputy Managing Directors of WASA Lahore, this committee investigates grievances thoroughly, conducts field visits when necessary, and makes decisions within ten working days. If a complainant remains dissatisfied, they are informed about their right to seek legal recourse.

The GRM is designed for accessibility and inclusivity. Complaints can be lodged through verbal or written submissions, phone calls, emails, or complaint boxes placed at project sites. Community Complaint Registers (CCRs) are maintained to log grievances, including details such as the complainant's name, address, and the nature of the issue. Contact information for GRM representatives and hotlines will be prominently displayed at project sites to facilitate easy access. Special provisions are made to assist illiterate complainants in documenting and following up on their concerns.

The GRM also emphasizes public awareness and transparency. Information about the GRM will be disseminated widely, including through brochures in Urdu to ensure comprehension among the local population. Notices will be displayed at contractor offices, camps, and other visible locations. Public awareness campaigns, led by the Environmental and Social staff, will further educate communities about the GRM's processes and benefits. The GRM encourages participation from all community members, ensuring that no one is excluded from the grievance redress process.

GRM is a comprehensive framework designed to ensure the fair, transparent, and prompt resolution of grievances. However, it is required to be instituted even at this planning and designing stage. GRCs need to be officially notified, complaint registers need to be placed at PMU and PMC’s offices.

4.11.2 ENVIRONMENTAL

The Grievance Redress Mechanism (GRM) outlined in the EIA serves as a structured approach to addressing grievances and complaints raised by Project Affected People (PAPs) or community members during the implementation of the project. The mechanism is grounded in principles of fairness, transparency, and prompt resolution. The primary goal is to resolve grievances without retribution against the complainants. The GRM also aims to promote public trust and confidence in the project by ensuring that all concerns are addressed systematically and efficiently.

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The complaints received will be properly recorded and documented in the Complaint Register by a designated member of staff. The information recorded in the register will include the date of the complaint, particulars of the complainant (such as name, address, national identity card number, as appropriate), description of the grievance, actions/steps taken/to be taken to resolve the complaint, the person responsible for the action, follow up requirements and the target date for the implementation of the mitigation measure. The register will also record the actual measures taken to mitigate these complaints. The aggrieved stakeholders will be kept informed about the actions on their complaints.

GRM is a comprehensive framework designed to ensure the fair, transparent, and prompt resolution of grievances. It fosters collaboration between the project and affected communities while ensuring accountability and operational efficiency. By addressing grievances effectively, the GRM enhances trust and engagement, ensuring the project's sustainability and success.

Sabu

4.12 INSTITUTIONAL ARRANGEMENTS

RAP of WWTP Babu Sabu consists of the organizational structure for the updating and implementation of the Resettlement Action Plan (RAP) involving multiple levels. LWASA is responsible for overall compliance with environmental and social safeguards. The Project Director PMU with the assistance of the staff of Environment and Social Cell (ESC) at PMU will supervise RAP implementation. The Supervision Consultant (SC) will be responsible for the implementation of RAP and GRM. SC will ensure that contractors adhere to environmental and social safeguards specifically for PAPs. The PMU will monitor RAP updates, review reports, and ensure contractors adhere to RAP guidelines. Moreover, the PMU facilitates permits from relevant departments and ensures timely disbursement of compensation for temporary land acquisition and other project needs.

The ESC, a specialized unit within the PMU, comprises a Manager for Environment, Manager for Social/Gender, Manager for HSE, and a Social and Resettlement Expert. The ESC is responsible for updating the census of PAPs, preparing compensation packages, and ensuring the disclosure of RAP documents to stakeholders. It establishes and manages a grievance redress mechanism and maintains communication with PAPs and other stakeholders. The

ESC monitors RAP implementation, organizes consultations, and conducts livelihood restoration activities, such as linking PAPs to project-related jobs and providing guidance on utilizing compensation payments effectively.

To ensure an accurate and comprehensive RAP update, LWASA engages consultants in two packages. Package 1 involves conducting a census, public consultations, and detailed socio-economic surveys to identify PAPs, assess project impacts, and ensure stakeholder engagement. This includes mapping affected land based on project design. Package 2 involves conducting a Replacement Cost Survey (RCS) to establish fair compensation values for PAPs. This process is carried out independently to maintain transparency and fairness.

The Supervisory Consultant (SC) oversees the contractor's performance and ensures compliance with the Environmental and Social Management Plan (ESMP) and RAP. The SC monitors construction activities, organizes training sessions for staff and contractors, and prepares periodic reports. It also ensures effective consultation, compensation processing, and record maintenance for RAP implementation. The SC's social team monitors physical progress, evaluates project impacts, and addresses environmental and social concerns. The team ensures compliance with resettlement guidelines and guides stakeholders for early issue resolution.

This structured institutional arrangement ensures the effective implementation of the RAP for the WWTP at Babu Sabu, safeguarding environmental and social interests while addressing the concerns of the PAPs.

4.13 MONITORING AND EVALUATION

Both internal and external monitoring will be carried out according to the Project’s activity schedule. Internal monitoring will be done by the ESU, with support from the PMC and PIC. For external monitoring, a qualified External Monitoring Consultant (EMC) approved by the AFD will be hired by the PMU. The EMC will verify the completion of compensation and provision of assistance and recommend the issuing of AFD’s no-objection before civil works can start. For the duration of the Project, quarterly internal and semi-annual external monitoring reports will be submitted to the AFD for review. All monitoring reports will be disclosed in the LWASA and AFD websites for general public disclosure.

4.14 FINDINGS AND AREAS OF CONCERN FOR ENVIRONEMNTAL AND SOCIAL SAFEGUARDS

The RAP of WWTP Babu Sabu is a preliminary RAP that will be updated during the design phase. The document, though covered resettlement and livelihood impacts and their mitigations, yet the following areas need to be taken care of during updating.

1. Environmental and Social Policy (ESP) of AIIB needs to be reviewed and the gaps between the ESF of the World Bank and ESP need to be addressed in EIA and RAP.
2. Enviornmental Management Plan needs to add risks associated with GBV, SEA and SH and mitigation measures thereof.
3. The LWASA project of the Trenchless Trunk Sewer produces a large amount of slurry which can be used for the construction of a spur on the WWTP site. This spur will save the WWTP site from floods.
4. The socio-economic and census survey of PAPs who refused to participate or were unreachable during the survey needs to be conducted to ensure the accuracy of RAP. Additionally inventories of losses with compensation has to be updated. The

entitlements are defined well in the RAP. However, these entitlements need firming up by including the impacts to be determined in the updated RAP. The rates applied in the entitlement matrix also need updating as per present-day official rates

5. ESS-10; Stakeholder Engagement and Information Disclosure of ESF of World Bank is missing in the legal framework. LWASA has to coordinate with several government departments during project execution. Although the Stakeholder Engagement Plan (SEP) is made part of EIA, it is recommended to prepare SEP as a standalone document since SEP being a living document will go for updating during the project execution.
6. The LRIP outlined measures for livelihood restorations encompassing assistance to PAPs and capacity building. However, more specific measures may be provided in terms of capacity building with a training plan based on training need assessment of PAPs and exploring options of training specifically skill development training from reputable training institutes can be envisaged with a backup plan for income generating options.
7. GRM is a comprehensive framework designed to ensure the fair, transparent, and prompt resolution of grievances. However, it is required to be instituted even at this planning and designing stage. GRCs need to be officially notified, complaint registers need to be placed at PMU and PMC's offices.

5 ENVIRONMENTAL AND SOCIAL CORRECTIVE ACTION PLAN

Table 5-1: Environmental and Social Corrective Action Plan

S.No.	Corrective Action	Responsible Agency/Consultant	Remarks	Tentative Timeline for Implementation
Environment Safeguards Corrective Actions				
1	Revising and updating the project Environment Impact Assessment/EMP	PMU-LWASA/PMC	The EIA/EMP needs to be updated by adding: Improved and more suitable options for Sludge Disposal Can be used for embankments/spur Can be used for horticulture or fodder production Reconsider the impacts of the flood on the project site Mitigation measures for the times when the Treatment Plant gets sick Risks relating to labor influx, GBV, SEA, SH need to be incorporated in EMP along with mitigation measures	June 2026
2	Obtain the pending clearances/ approvals/ permissions	PMU-LWASA/PMC, Irrigation Department	The Irrigation Department has been consulted but the NOC is still required from them	August 2026
3	Information disclosure to Stakeholders	PMU-LWASA/PMC	All the permissions/ approvals that are in the language need to be translated into English and submitted to the bank. Translate GRM and project summary into the local language for local people	September 2026
4	Issue official notifications of GRC and in place GRM	PMU-LWASA	Official notifications of GRCs are issued. Complaint registers are placed at the PMU office. Information related to GRM has been disseminated to stakeholders	March 2025
Social Safeguards Corrective Actions				
5	Updating of Resettlement Action Plan (RAP)	PMU Babu Sabu-LWASA	The socio-economic and census survey of PAPs who refused to participate or were unreachable during the survey needs to be conducted to ensure the accuracy of RAP. Additionally, the inventories of lost assets has to be prepared based on the census survey and incorporated in the RAP. The entitlements are defined well in the RAP.	June 2026

S.No.	Corrective Action	Responsible Agency/Consultant	Remarks	Tentative Timeline for Implementation
			However, these entitlements need firming up by including the impacts to be determined in the updated RAP. The rates applied in the entitlement matrix also need updating as per present-day official rates. The RAP will be updated accordingly.	
6	Preparation of Stakeholder Engagement Plan (SEP)	PMU-LWASA/PMC	ESS-10; Stakeholder Engagement and Information Disclosure of ESF of World Bank need to be followed to prepare a Stakeholder Engagement Plan.	In- process
7	Updating of Livelihood Restoration Improvement Plan (LRIP)	PMU-LWASA/PMC	Specific measures may be provided in terms of capacity building with a training plan based on training need assessment of PAPs and exploring options of training specifically skill development training from reputable training institutes with a backup plan for income generating options.	June 2026
8	Implementation of Grievance Redress Mechanism		GRM is required to be instituted even at this planning and designing stage. GRCs need to be officially notified, complaint registers need to be placed at PMU and PMC's offices.	June 2025

ANNEXURES

ANNEXURE-I

NOC FROM EPA FOR WWTP

GOVERNMENT OF THE PUNJAB
ENVIROMENTAL PROTECTION AGENCY
National Hockey Stadium, Gate No. 10
Ferozpur Road, Lahore

No. AD(EIA)/EPA/F-100(EIA)/2024/ 1035
Dated: 17 / 12 /2024

To

Mr. Hafiz Muhammad Ijaz Rasul,
Deputy Managing Director, Engineering,
Proponent,
WASA, Lahore,
31-B Zahoor Elahi Road, Block-B Gulberg-II, Lahore

Subject: **DECISION OF EPA PUNJAB REGARDING PROJECT "INSTALLATION OF WASTEWATER TREATMENT PLANT BY WASA AT SOUTH WEST OF LAHORE 1.5-KM AWAY FROM BABU SABU INTERCHANGE ALONGWITH MOTORWAY, LAHORE"**

1.	Description of Project:	Installation of Wastewater Treatment Plant
2.	Location of Project:	At South West of Lahore 1.5-Km Away from Babu Sabu Interchange alongwith Motorway, Lahore
3.	Date of filing of EIA:	14-05-2024
4.	Validity of Approval:	This approval shall be valid (for commencement of construction) for a period of three years from the date of issue under Regulation 16 of IEE & EIA Regulations, 2022

5. After careful review of Environmental Impact Assessment (EIA) Report, EPA Punjab has considered Site Inspection Report received from Deputy Director (Environment), Lahore vide his letter No. 879/DD(E)/EPA/LHR dated 31.07.2024. Proceeding of public hearing held on is 12.09.2024 and Minutes of public hearing received from Field office on 6.11.2024. EPA Punjab has also considered the recommendations of **Committee of Experts** (Meeting dated 03.12-2024) and other relevant record to take lawful decision.

6. **Environmental Protection Agency Punjab accords Environmental Approval under Regulation 11 of Punjab Environmental Protection (Review of IEE / EIA) Regulations, 2022 read with Section 12 of Punjab Environment Protection Act 1997 for the establishment/construction of your aforesaid project subject to the following conditions:**

i. The Proponent shall ensure compliance with the Punjab Environmental Quality Standards (PEQS) notified for particulate matter, gaseous emissions, waste water and noise so as to protect the air, water bodies, soil and health of the people;
ii. Mitigation Measures suggested in the EIA Report and Environmental Management Plan (EMP) shall be strictly adhered to control any negative impacts on soil, ground water, air and biological resources of the Project area;
iii. The proponent shall maintain the auditable record of measures taken during implementation of Environmental Management Plan for periodical verification by EPA, Punjab;
iv. Monitoring shall be carried out during the entire period of the project activities. Monitoring Reports shall be submitted to EPA Field office on quarterly basis;
v. The proponent shall provide a copy of EIA report and copy of this letter to the contractors for their information and compliance with conditions / measures suggested in these documents;
vi. Arrangement shall be made for the safe disposal of municipal and solid waste;
vii. Effective arrangements shall be made for the proper disposal of sludge. The sludge shall be retained within the unit boundary/premises and will be disposed of in an environment friendly way at a suitable disposal facility;
viii. The wastewater shall neither be injected into aquifer nor drained into agricultural land or any fresh water body.
ix. The proponent shall lay down Geo Membrane in retention tanks / facultative ponds / wet land and shall take all required measures to avoid contamination of groundwater;
x. The proponent shall also obtain approval / NOC from Department concerned for the disposal of wastewater

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-2-

xi. The construction material shall be stored in such a way that it shall not destroy or damage environment of the locality;
xii. The proponent shall sprinkle water on daily basis during construction activities as dust suppressant;
xiii. The proponent shall redress the grievances/objections / concerns of stakeholders on priority basis (if arises at any stage);
xiv. The Proponent shall plant 1000 trees of 6-7 feet height of indigenous species in respective district. The Proponent shall also take measures for protection and upkeep of these trees and shall maintain their proper record for verification by EPA;
xv. The proponent shall ensure preservation and compensation of social environment as per law of the land.
xvi. The proponent shall do landscaping and restore the environment after completion of the construction work and;
xvii. Majority of unskilled and, up to the extent possible, skilled jobs shall be given to the locals

7. EPA deals with only environmental aspects of the projects and does not deal with revenue matters / land issues.

8. The proponent shall be liable for compliance of Regulation 12, 13, 15, 16, 17 and 18 of Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022

9. The proponent shall be liable for correctness and validity of information supplied to this department directly or through Environmental Consultant.

10. This Environmental Approval for the project does not absolve the proponent of the responsibility of obtaining necessary permissions from any other authority which is required under the law.

11. This approval shall be treated as null and void if all or any of the conditions mentioned above, is/are not complied with. This approval does not absolve the proponent of the duty to obtain any other approval or consent that may be required under any law in force.

12. This approval shall be valid (for commencement of construction) for a period of three years from the date of issue under Regulation 16 of Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022.

13. This approval stands revoked at any-time without any prior notice if deemed necessary in the public / national interest.

ASSISTANT DIRECTOR (EIA)
for DIRECTOR GENERAL, EPA, PUNJAB

NO. & DATE EVEN.

1. A copy is forwarded to Deputy Director (Environment), Lahore. He is requested to ensure compliance of the conditions contained in the Environmental Approval and maintain the file/record of correspondence with the project proponent properly.
2. One window Cell, EPA HQs, Lahore.

ASSISTANT DIRECTOR (EIA)

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ANNEXURE-II

Photo Log



Joint Site Visit of PMUs and PMC Staff of Sewerage Project



Site of WWTP Babu Sabu