ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT

LANDFILL SITE

(A PROJECT BY SUTHRA PUNJAB)

At Rangeela Shah Darbar Road, Tehsil Hasilpur, District Bahawalpur.

PROPONENT:

Mr. Usman Haider S/o Fiaz Haider

CONSULTANTS:

ECOSPHIRON ENVIRONMENTAL SERVICES

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EXECUTIVE SUMMARY

INTRODUCTION

This executive summary presents an overview of the main findings of the Environmental Impact Assessment (EIA) report for the project named as "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur". The coordinates of the are 29.681174 and 72.534933.

A landfill site (or simply landfill) is a designated area where waste is disposed of by burying it in the ground. It's one of the oldest and most common methods of waste management worldwide. A landfill is a carefully designed structure built into or on top of the ground, in which trash is isolated from the surrounding environment (air, water, and soil) using a system of liners and coverings.

Proposed project is about landfill site which is a project under Suthra Punjab located at Tehsil Hasilpur and District Bahawalpur. Establishing a landfill site in Hasilpur under the Suthra Punjab program is essential for proper waste management. It will prevent environmental pollution caused by open dumping and burning of waste. A regulated landfill will protect public health by reducing disease risks and contamination. This aligns with Suthra Punjab's vision of a clean, green, and healthy Punjab. Total area of project site is 138 Kanals and total cost of project is 60 million. This project will execute by contractor (M/s Al-Rehmat Construction & Engineering) as outsourcing for Solid Waste Management Services (along with available resources) for Tehsil Hasilpur, District Bahawalpur for four (04) years.

SALIENT FEATURES OF PROJECT

1.	Project title	Landfill Site (A project by Suthra Punjab)
2.	Location	located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur
3.	District	Bahawalpur
4.	Name of proponent	Mr. Usman Haider S/o Fiaz Haider (Proponent)
5.	Address of proponent	R/O H. # 412, Block III, Muhallah Sector C2 Quid-e-Azam, Town Ship Lahore

6.	**Area of the project**	138 Kanals
7.	Type and category of project	The proposed project falls under Schedule II-G- (Waste Storage and Disposal) and it its sub section I is "Landfill Sites).
8.	Nature of the Project	It is a proposed project i-e open land at all. Proponent will start all activities after the approval by EPA as per requirement.
9.	**Total cost of the project**	**60 millions in PKR**
10.	Availability of resources	Transportation, water supplies, electricity will be available at that specified area.
11.	Source of electricity	WAPDA Electricity is available at that specified site.
12.	Manpower requirement	10 workers in constructional site and 10 workers in operational site.
13.	Water requirement	The whole project will require about 200 gallons/day of water during constructional phase and approximately 100 gallons/day of water during operational phase. This will be met by ground water.
14.	Solid waste and its management	Solid waste during construction phase will be re-used in construction activities. During operational phase, there is no need to get rid from solid waste because said project is itself a landfill site (waste site).
15.	Wastewater and its treatment in proposed project	Waste water quantity will discharge after treatment through septic tanks into nearby fields.

Environmental Consultants

An Environmental Impact Assessment (EIA) study report has been prepared to identify and predict the significant environmental impacts likely to arise from the commencement of the proposed project along with environmental impact statement followed by delineation of appropriate Environmental Management Plan and Environmental Monitoring Plan to check the implementation of the EMMP. Proponent of "Landfill Site (A project by Suthra Punjab)

located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur" has decided to conduct EIA report through environmental consultants, Ecosphiron Environmental Services, Office # VII, F-2, 9 Kashmir Block, Jalal Center, Allama Iqbal Town, Lahore.

Contact Numbers: 0322-4908520, 0301-4276787

Email Address: ecosphiron@gmail.com

A Brief Outline of Proposal

Respective project is an open plot where there are no any squatter settlements. There are no any structures on the proposed site so no any structure will be demolished. This Environmental Impact Assessment (EIA) report has been prepared to evaluate the potential environmental impacts associated with the development and operation of a proposed landfill site. The primary purpose of the landfill is to provide a scientifically managed and environmentally sound facility for the disposal of municipal solid waste generated within the designated service area.

The increasing volume of solid waste, driven by urbanization, population growth, and industrial activities, necessitates the development of a sustainable waste management solution. The proposed landfill site is designed in accordance with national regulations and international best practices to minimize negative environmental effects, such as groundwater contamination, air pollution, and greenhouse gas emissions.

This report outlines the baseline environmental conditions of the project site, identifies and assesses the potential impacts of the landfill's construction and operation, and proposes mitigation measures to reduce adverse effects on the surrounding environment and communities. The EIA also includes a detailed evaluation of alternatives, public consultation outcomes, and an environmental management plan (EMP) to ensure long-term environmental compliance and sustainability of the project.

Currently, it is a proposed project. While proper operation with compliance of Environmental Conditions will be started after getting Environmental Approval.

The Major Impacts & Recommended Mitigation Measures

Keeping in view, all the findings of the baseline study, and through general observation and desktop study, and understanding of the activities and processes involved in the project, environmental impacts have been anticipated. Following impact assessment methodology; i.e. defining the criteria for evaluation of the impacts, identification of mitigation measures (all possible options), evaluation of the residual impacts and identification of the monitoring requirements, adequate and effective mitigation measures have been proposed for all construction and operation related likely environmental impacts of the project. These mitigation measures have been proposed in order of attempts to eliminate or minimize the impact, provide some compensation or rehabilitate the environment by some means.

Weather describes an impact as having both spatial and temporal impacts, which can be described as the change in an environmental parameter over a specified period and within a defined area, resulting from a particular activity compared with the situation which would have occurred had the activity not been initiated. The expected impacts from the project are mostly insignificant and others are of limited nature. In this regard possible improvements and mitigation measures have been taken. The study also shows that there will be no exploitation and consequential depletion of the local natural resources. The general approach to Environmental Management Plan for the project, for the construction and operational phases of the Project has been presented, along with an outline plan for the project Environmental Management Plans (EMPs). Site specific and practically suitable mitigation measures are recommended to mitigate the impacts.

Proposed Monitoring:

Monitoring at the proposed sites has been conducted for ambient air, Noise level and ground water and the reports demonstrated that results are within the limits prescribed by PAK-PEQS (2016). The values of these parameters are present in baseline study of project.

Conclusion

The Environmental Impact Assessment (EIA) contains description of the project, description of the environmental baselines, potential environmental impacts and suggested mitigation measures. An implementation mechanism for mitigation measures in the form of an Environmental Management Plan is included in the study. While the objectives of this study

have been to describe the project and its environmental impact, it also identifies adverse environmental factors associated with the project. Appropriate mitigation measures as explained in the environmental study should reduce, if not eliminate, these impacts so that these are within acceptable limits.

It is further concluded that all potential environmental concerns associated with the project have been adequately addressed, and no further study is required in this context.

The main persons involved in finalizing EIA report are following;

Ms. Shakeela Rani	**Mr. Manzoor Ahmad**
(Environmentalist)	(Environmentalist)

For the Proponent

I have reviewed the project EIA report and found the contents to be valid and true to the best of knowledge and belief.

Mr. Usman Haider S/o Fiaz Haider
(Proponent)
Landfill Site (A project by Suthra Punjab), Bahawalpur

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CHAPTER I

INTRODUCTION

1.0 Purpose

Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur, is intending to develop a site where waste will be dumped from whole city Bahawalpur. The study has been carried out to estimate the potential environmental and social impact assessment, both positive and negative, on the environment as well as socio-economic fabric of the surrounding environment during construction as well as operational phase. This report intends to provide satisfactory mitigation measures to avoid/eliminate any chance of adverse environmental impact on the socio-cultural, economic and environmental components. This report also intends to fulfill the regulatory requirements set under Punjab Environmental Protection Act (Amended 2012) 1997 and its consequent legislative framework for IEE/EIA including the IEE/EIA Regulations **2022 and the guidelines drafted for IEE and EIA under numerous sectorial heads. The entire set of** legislative framework requires any new development project to undergo an IEE or EIA based on the categorization of the project under Schedule I and/or Schedule II.

1.1 Identification of the Proponent

Name of Proponent: Mr. Usman Haider S/o Fiaz Haider

Address of Proponent: R/O H. # 412, Block III, Muhallah Sector C2 Quid-e-Azam, Town Ship Lahore

1.2 Environmental Consultants

The Environmental Impact Assessment (EIA) has been carried out by aptly skilled and duly qualified group of professionals working for the environmental consulting Services namely Ecosphiron Environmental Services. The consulting team can be approached through the following contact details:

Ecosphiron Environmental Services, Office # VII, F-2, 9 Kashmir Block, Jalal Center, Allama Iqbal Town, Lahore. 0322-4908520, 0301- 4276787, ecosphiron@gmail.com

1.3 Nature and Size of Project

The project aims as the management is establishing the "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur".

The capital cost of the project is 60 million in PKR. The project will spread over an area of 138 Kanals with tree plantation around the boundary. As a result of the project, around 10 people will get jobs during establishment phase and another approximately 10 persons will be engaged during operational process depending upon capacity/production of the unit. Labor from the locals will be preferred.

1.4 Eco-Friendly Features of the Project

Special feature of the project is its eco-friendly design through provision of unique elevation and landscaping. The basic idea of the concept is to create a safe, modern as well as environmentally friendly design to ensure improved working conditions required by the potential users. The reason of adopting sustainability or 'bioclimatic' approach to the design provides opportunities to address problems relating to energy usage and air quality.

1.5 Location

The proposed project is located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur". The project site is surrounded by open plot area while in front main road is passing. Based on the current land use of the proposed project, the said project is not located in an ecologically sensitive area.

1.6 Extent/scope of EIA Study

This EIA report has been conducted in accordance with the requirements of PEPA, 1997 (amended 2012), IEE/EIA regulations 2022 as well as section 2.3 of the guidelines for the perpetration and review of environmental reports, November 1997/2022. This EIA report presents screening of potential environmental impacts of the proposed construction and operational phase and presents the necessary mitigation measures to eliminate or reduce the negative impacts to an acceptable level. The report provides an Environmental Management and Monitoring Plan and the institutional requirements for the implementation of this plan.

The EIA process followed all the complementary stages described in the guidelines for IEE/EIA preparation and review. A brief flowchart exhibiting the different stages involved is in figure 1.1.

The format of this EIA covers the followings:

- Introduction
- Project Description
- Environmental Regulatory Framework
- Description of the Environment
- Screening of Potential Environmental Impacts and Mitigation Measures
- Environmental management and Monitoring Plan
- Stakeholders Consultation
- Conclusions and Recommendations
- Annexure

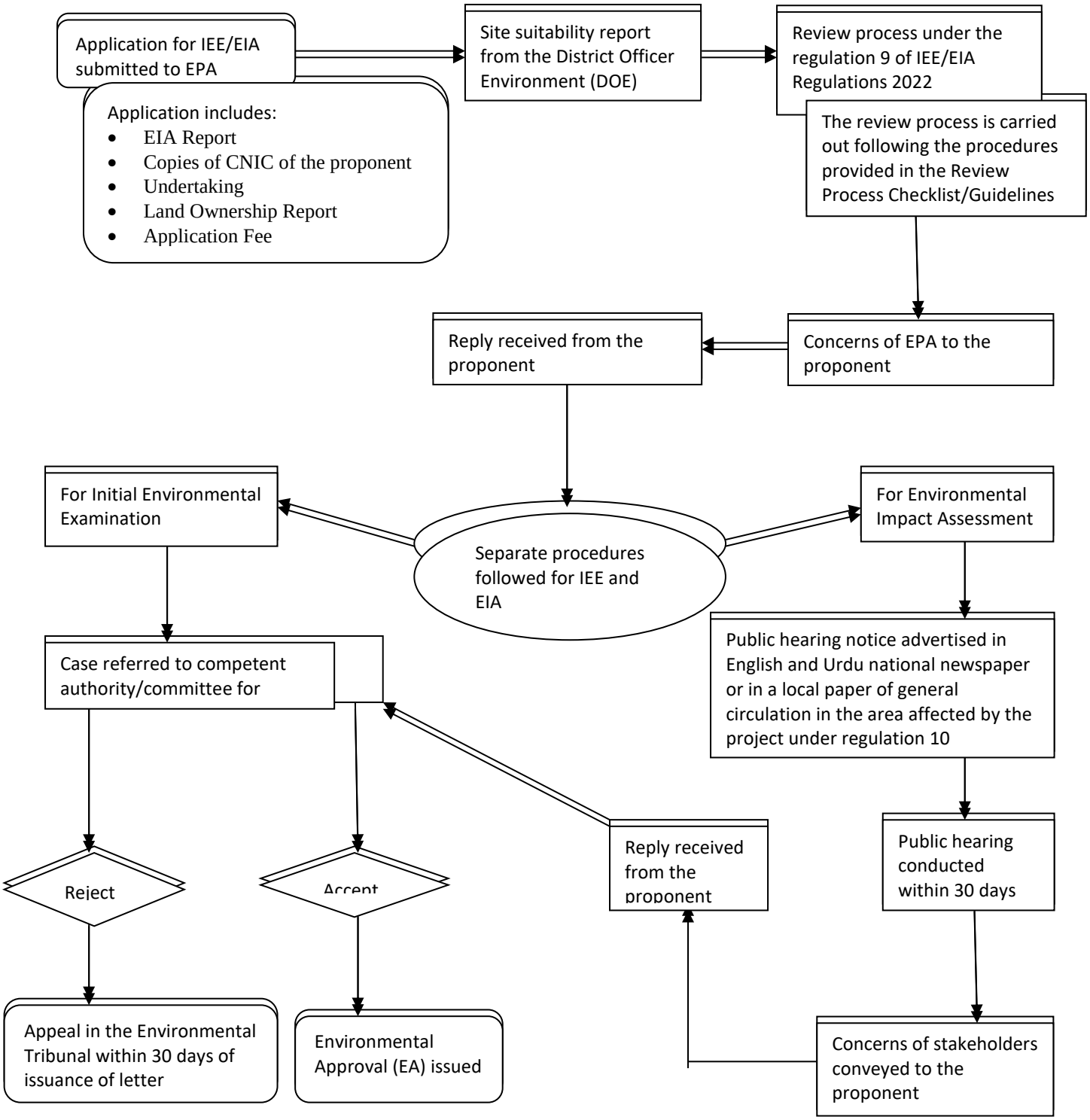


Figure1.1 A Process Flowchart

CHAPTER II

DESCRIPTION OF THE PROJECT

2.0 Type and Category of Project

According to projects categorization for environmental assessment studies, the proposed project that is "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur" falls under The proposed project falls under sub-section 1 Landfill Sites of section G (Waste Storage and Disposal) of Schedule II that is for EIA. This report is required to fulfill the legal requirements set under section 12 of the Punjab Environmental Protection Act, 1997 (Amended 2012). This section of the study renders a detailed account of the project and its salient features, such as location and various phases. Inputs and discharges relevant to different phases of the project, such as electricity & materials etc. have also been examined as a response to possible environmental concerns.

Category of Landfill Site

According to its capacity and categorization it falls in EIA type projects.

2.1 Objectives of the Project

The objective of the proposed Project is as following;

- **Safe Disposal of Waste**

  To provide a scientifically designed and managed facility for the safe, hygienic, and long-term disposal of municipal solid waste, industrial waste, or other approved waste types.

- **Environmental Protection**

  To minimize environmental pollution, particularly the risk of soil, groundwater, and air contamination, through the use of engineered liners, leachate collection systems, and gas management systems.

- **Public Health and Safety**

  To reduce the negative impacts of improper waste disposal (such as open dumping or burning), thereby protecting human health and reducing exposure to hazardous substances, pests, and disease vectors.

- **Controlled Decomposition**
  To allow for the controlled and monitored breakdown of organic waste, with systems in place to manage resulting gases (like methane) and leachate.
- **Waste Volume Reduction**
  To compact and reduce the volume of waste through daily operations, extending the operational life of the landfill and optimizing land use.
- **Compliance with Legal and Regulatory Standards**
  To ensure that all waste disposal activities comply with national and local environmental regulations, including monitoring and reporting requirements.
- **Post-Closure Land Use**
  To allow for future rehabilitation or repurposing of the site (e.g., green spaces, solar farms) after the landfill is closed and stabilized.
- **Support Integrated Waste Management**
  To act as part of a broader integrated waste management system, supporting strategies like waste minimization, recycling, and composting by handling residual waste that cannot be otherwise processed.

2.2 Why Landfill Site Programs Are Being Carried Out Under Suthra Punjab

The landfill site program under the Suthra Punjab initiative was introduced to address serious waste management problems in Punjab, especially in rural and underserved urban areas like Hasilpur, Bahawalpur, and other tehsils. Here's a clear explanation of why Suthra Punjab is implementing landfill site programs:

1. To Replace Unsafe Waste Disposal Practices

- In most tehsils, waste is dumped in **open and unregulated sites**, causing pollution, disease, and land degradation.
- Suthra Punjab aims to **transition from open dumping to engineered landfill sites** that are safe, regulated, and environmentally controlled.

2. To Improve Public Health and Sanitation

- Poor waste disposal leads to the spread of **diseases**, vector-borne illnesses, and **contaminated drinking water**.
- Landfill programs under Suthra Punjab reduce these risks by:

- Using **proper liners**
- Collecting **leachate**
- Managing **waste in a controlled way**

3. To Comply with Environmental Laws and Court Orders

- The **Lahore High Court** and **Environmental Protection Department (EPD)** have directed districts to manage waste according to **Pakistan Environmental Protection Act (PEPA) 1997** amended 2012.
- Suthra Punjab helps tehsils **meet legal requirements** by formalizing waste systems, including **approved landfill development**.

4. To Standardize Waste Management in Smaller Cities and Tehsils

- Only major cities like Lahore had formal landfill sites.
- Suthra Punjab brings **waste infrastructure to neglected areas**, including:
  - **Landfill development**
  - **Waste collection outsourcing**
  - **Transfer stations and recycling**

5. To Protect Soil, Water, and Air

- Engineered landfills reduce:
  - **Groundwater contamination** from leachate
  - **Methane emissions** from decomposing waste
  - **Uncontrolled burning** and open fires
- This supports **environmental sustainability** in line with Punjab's **climate goals**.

6. To Create Green Jobs and Improve Local Governance

- By improving waste services and formalizing the sector:
  - **New jobs** are created in waste handling, recycling, and landfill management.

- **Municipal authorities** improve capacity and service delivery through training and PPP (public-private partnerships).

DISCIPLINARY POLICY

The project expects that its employees will strive to work together to promote the interests of all legitimate business operations. Each employee will be shown, informed and trained to perform the functions which the plant requires to be performed. Employees are expected to perform their tasks as required, and with responsibility.

Disciplinary action may be initiated by the immediate supervisor of the employee or by members of management, after the case has been discussed with the immediate supervisor. All disciplined employees have the right to appeal a perceived injustice by bringing the case before management. However, the immediate supervisor must be informed by the employee that he would like to redress an action taken against him/her by discussing it with a member of management.

Any of these actions will result in immediate dismissal, without recourse to review.

Around 10 people will get jobs during establishment phase and another 10 people approximately will be engaged during operational phase depending upon capacity/production of the unit. Labor from the locals will be preferred.

The project proponent established contact with the Environmental Protection Agency **(EPA)**, Government of the Punjab for the grant of environmental approval.

This requirement is under the regulation of Review of IEE and EIA Regulation 2022. Accordance with the above-mentioned list this project falls in the category of projects requiring EIA.

The preparation and submission of an EIA report for any project is a statutory obligation under Punjab Environmental Protection Act, 1997 (Amended, 2002) in terms of Section 12 (1) of the Act which states as under:

"No proponent of a project shall commence construction or operation unless he has filed with the Provincial Agency an Environmental Impact Assessment (EIA) or where the project is likely to cause an adverse environmental effect, an environmental impact assessment, and has obtained from the Federal Agency approval in respect there of".

Accordingly this EIA report has been prepared following the format conforming to the "Guidelines for the preparation and review of Environmental Reports, October 1997" approved by the Government of Pakistan.

The baseline study of the existing environmental conditions in the project area including the identification of environmentally sensitive areas is as under.

1. Identification of environmental issues and activities arising because of project's intervention.
2. Assessment of environmental impacts and their significance.
3. Suggesting appropriate mitigation measures for minimizing/ reducing/ controlling the adverse impacts.
4. Designing environmental monitoring and evaluation methods for supervising the environmental performance of the project.
5. Formulation of Environmental Management Plan for environmentally smooth implementation of the project.
6. Assess the proposed activities and determine their compliance with the relevant environmental regulations in Pakistan.
7. Prepare an EIA report for submission to the Environmental Protection Agency (EPA) Punjab.
8. To provide information to the proponent, stakeholders and designers for alleviating potential adverse impacts. To identify the potential impacts of the project intervention on resources and receptors (direct or indirect).

2.2 Site Alternatives Considerations

1. Context & Rationale for Alternatives

- **Current Scenario**: Waste from Hasilpur and surrounding tehsils is likely being disposed of in open dumps or informal sites, as Punjab has only one officially

approved sanitary landfill in Lahore; other districts—including Bahawalpur—rely on unsafe disposal methods

- **Local Waste Management Practices**: There's substantial informal recycling and waste scavenging in Bahawalpur City, with up to 64 tons/day recovered by the informal sector
- **Government Initiatives**: The **Suthra Punjab** sanitation program under the Clean Punjab initiative promotes modern waste solutions across tehsils, including rural areas like Hasilpur

2. Site Alternatives for EIA Evaluation

Here are viable alternatives to a traditional landfill you could evaluate:

a) Bioreactor Landfill

- **Description**: Enhances landfill decomposition through leachate recirculation or aeration, accelerating breakdown and reducing long-term monitoring needs
- **Pros**: Faster waste volume reduction (up to +30 %), earlier site closure, improved methane capture.
- **Cons**: Higher initial monitoring costs; moisture may affect structural stability and gas extraction systems.

b) Composting Facility for Organic Waste

- **Description**: Processing organic fraction (which is ~50% of waste) through aerobic composting, generating soil conditioner—similar to Lahore's composting
- **Pros**: Addresses agricultural soil degradation, reduces landfill input, produces marketable compost.
- **Cons**: Requires separation at source, training, and market development for compost.

c) Material Recovery Facility (MRF) + Mechanical Biological Treatment (MBT)

- **Description**: Sorts recyclables and organic waste for recycling or treatment (e.g. anaerobic digestion)

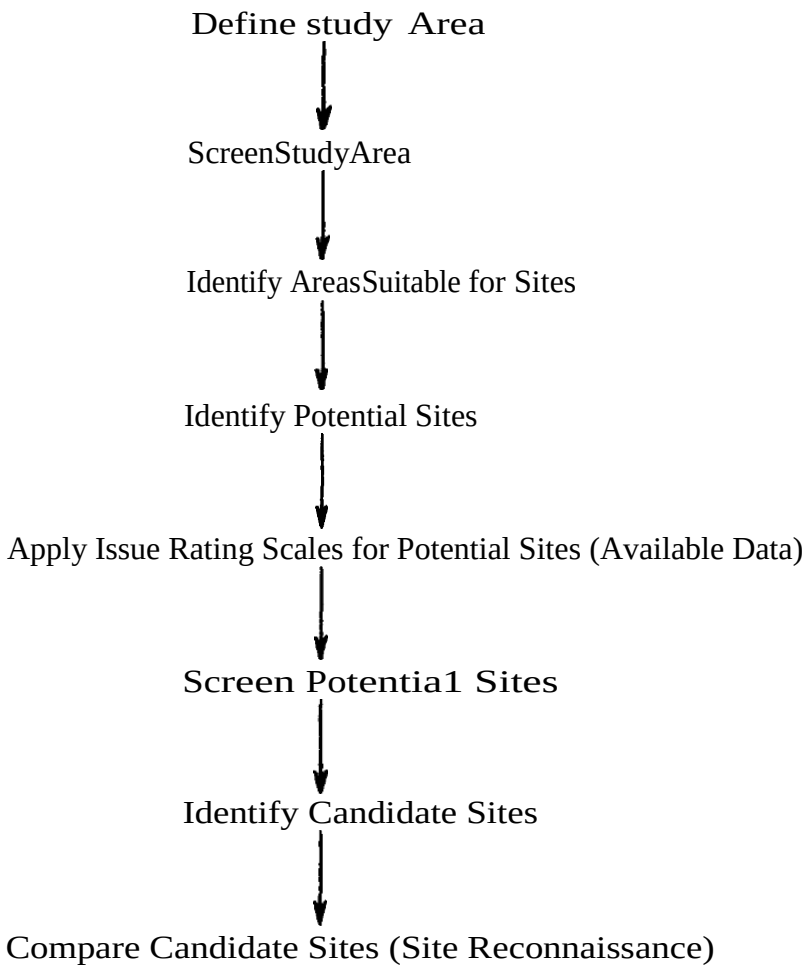
- **Pros**: Maximizes resource recovery, potential for energy-from-waste, supports formal-informal waste sectors.

- **Cons**: Capital-intensive, needs skilled operations.

d) Public–Private Outsourcing of Waste Services

- **Description**: Under Clean Punjab, SWM services in Hasilpur are being outsourced to private contractors, enhancing collection and service delivery
- **Pros**: Improves efficiency, brings modern equipment, and can integrate alternative disposal options.
- **Cons**: Dependent on contract performance and oversight.

Site Selection Format for "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur"



The steps involved in implementing a site selection study which identifies sites which meet the "obviously superior'* criterion must at some point consider that:

- The existing laws and environmental standards for air, water, and waste disposal must be incorporated into the site selection criteria.
- Various environmental, social/economic, and engineering considerations, usually called “issues of concern," must be incorporated into the study. Examples of such issues are :
  - Aquatic biology
  - Noise
  - Terrestrial biology
  - Aesthetics
  - Air quality
  - Ground water contamination
  - Socioeconomic effects
  - Surface water contamination
  - Project cost
  - Health

Keeping these considerations in mind five alternatives considered.

After the completion of construction after obtaining Environmental Approval from EPA Punjab, the proponent will take into consideration, all the locally available technology options to incorporate the best one into project operation.

In view of all these facts, it is concluded that a feasible project at the most suited location has been proposed and will employ the best locally available technology option considering all the alternatives. Keeping these requirements and their availabilities, the present site is the best suited for the construction of the project. The area is far away from the dense residential activity. All the other basic infrastructural requirements are available at the selected site.

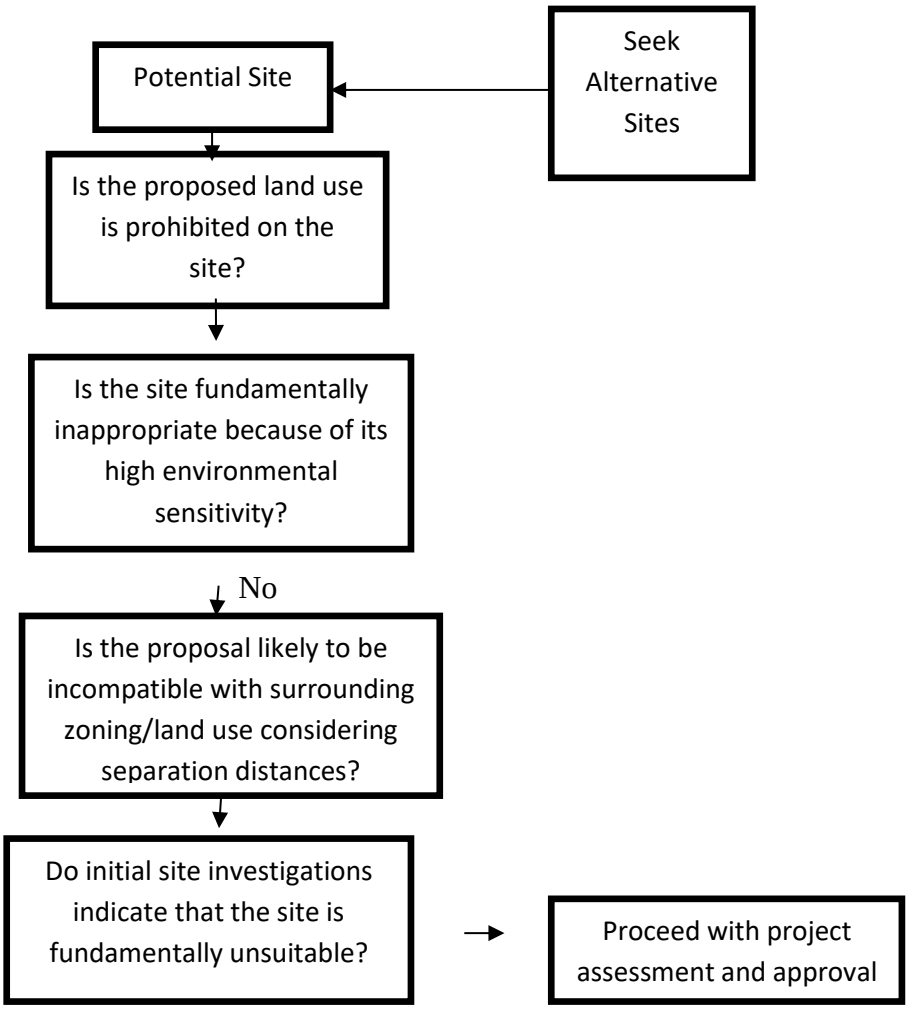


Figure 1.2: Site Selection Principle

Moreover, there is no ecologically sensitive or declared protected area such as Territorial Waters, forest, game reserve or biodiversity parks within a 05 km radius of the project site, requiring the proponent to look for site alternatives.

2.3 Location Plan/Map

The proposed project "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur".

And project layout plan is attached herewith this report as annexure.

2.4 Magnitude of the Operation Including Capital Cost and Associated Activities

The proposed project intends on development of "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur".

The cost of the project comprises of 60 million in PKR approximately. The said project is an open plot. There is no any reserved forest or protected area within 5km of the proposed site.

There are no significant or well-shaped trees and shrubs on the project site. No fresh water bodies are known to exist in the vicinity of the project area; therefore, there will not be any deterioration of surface water quality. During the construction vehicles and machinery will be employed. These will generate some dust and smoke temporarily which will definitely stop on completion of the construction work.

The potential negative impacts during construction and operational stage of the project will be mitigated to an acceptable level. Comparison of potential adverse and beneficial impacts of the project shows that project will prove to be beneficial for the inhabitants of the area. Hence the proposed project will prove to be beneficial and also increase the socio-economic status of the nearby inhabitants, and will contribute in the overall economy of the country.

Necessary mitigation measures are recommended in the report to make the proposed project Environment Friendly. Environmental Management Plan identifies monitoring needs and implementation on Environmental Management Plan is also recommended. The EIA concludes that the proposed project has indicated that there are no significant environmental impacts associated with the construction and operation phase of the project, if the anticipated impacts are properly mitigated; therefore, no further EIA study is required.

2.5 Water Requirement

The surplus water during the construction phase of the whole project will be estimated to meet any unforeseen situation. The water demand will be fulfilled from ground water. Water demand for various uses has been estimated on the basis of WASA specifications. Water requirement for maintenance of green belts will be done on daily basis by ground water through pumps and pipes to avoid wastage of water. The water requirement for the construction phase will be 200 gal/day while during operational phase water requirement will be 100 gal/day

2.6 Wastewater Generation and Disposal

Wastewater to be generated from the project during construction phase will be reused for multi purposes like sprinkling on dust, making of construction material etc. while domestic wastewater during construction phase will be no issue because workers will use surrounding bathrooms like of masjid etc. During construction phase, wastewater quantity is unpredicted might be 200-300 gallons/day while this wastewater will never be Wastewater will be drain out after treatment into the WASA drainage system which is nearby of project site approximately at 5km distance. The wastewater during operational phase will be domestic only for these purpose septic tanks will be made. Its quantity is might be 200-250 gallons/day.

2.7 Solid Waste Generation and Disposal

Estimated quantity of solid waste during construction phase is varied. The reason being, solid waste will have excavation material as major part of its overall composition. However, the earth material will be reused within the site eventually leaving zero waste due to excavation activities. Therefore, during operational phase there is no need to measure the ways to get rid from solid waste as said project is landfill site.

2.8 Energy Demand

The energy will be supplied by WAPDA.

2.9 Manpower Required

The man power during construction phase will be approximately 10 and operational stages will be approximately 10 persons. Thus, the project is source of employment for economic development activities of the area.

2.10 Proposed Schedule of Implementation

It is estimated that the completion of construction phase of entire project will be started after getting environmental approval from EPA, Punjab.

Activities involved are:

- Land acquisition – already done (Land ownership documents are along with this report)

- Lay out plan of project (attached herewith this EIA report)
- Leveling of land
- Excavation for foundation building
- Construction of site
- All finishing work of the entire construction work will be furnished after last step.

2.11 Details of Restoration and Rehabilitation at the End of the Project Life

"Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur" will staff more people for the proper maintenance of the proposed project under the skilled supervision of the site supervisors. This staff will add to the already working staff for the maintenance of activities. Regular maintenance can increase the life expectancy of such project considerably. However, if and when the end-of-life time period of the project comes, safety measures will be adopted.

2.12 Government Approvals

Project need Environmental approval after winning bid.
Working on a **landfill site** involves exposure to physical, chemical, and biological hazards. To ensure **security and safety**, workers and operators must follow structured safety protocols, use protective equipment, and undergo proper training.

2.13 Get work on landfill site with security and safety

Here's a detailed guide on how to **work safely and securely on a landfill site**:

1. Personal Protective Equipment (PPE)

Always wear the appropriate PPE:

- **Hard hat** – for protection from falling debris
- **High-visibility vest/jacket** – to stay visible to machinery operators
- **Steel-toed boots** – for foot protection in rough or uneven terrain
- **Gloves** – for handling waste or tools
- **Dust mask or respirator** – especially when working near decomposing waste
- **Safety goggles** – to protect eyes from chemicals or flying particles

- **Ear protection** – when working near loud machinery

2. Worker Training and Induction

Before starting work:

- Undergo **site-specific safety training** and orientation
- Learn about **site hazards** (leachate, methane gas, unstable surfaces, sharps)
- Understand **emergency procedures**, including fire, gas leak, and injury response
- Get trained on how to handle **waste safely**, including hazardous or medical waste (if present)

3. Site Safety Rules

Follow all operational guidelines:

- Stay within **designated work zones** and access routes
- Never walk or drive on **unstable or freshly filled waste areas**
- Obey **traffic rules** for landfill vehicles
- Never operate machinery unless you are **licensed and authorized**
- Be cautious around **landfill slopes**, which can collapse without warning
- **Do not smoke** on site—methane gas is flammable

4. Environmental Hazards Management

- **Methane Gas**: Monitor gas levels regularly using sensors; avoid ignition sources
- **Leachate**: Avoid contact with leachate ponds or liquids leaking from waste; they can contain toxic chemicals
- **Vectors**: Use insect and rodent control systems to reduce disease risk
- **Medical Waste**: If present, must be separated and handled using special procedures and PPE

5. Emergency Preparedness

Have systems in place for:

- **Fire safety**: Sand, extinguishers, or water trucks readily available
- **First aid**: On-site first aid kits and trained personnel
- **Evacuation**: Clearly marked emergency exits and muster points
- **Communication**: Radios or phones for quick contact in emergencies

6. Hygiene and Health Practices

- Wash hands before eating or drinking
- Do not eat in waste handling areas
- Use **decontamination stations** or washrooms before leaving site
- Report cuts, punctures, or health symptoms immediately to site supervisor

7. Security Measures

To protect the site and its personnel:

- **Fencing and gated access** to prevent unauthorized entry
- **Security personnel** or surveillance cameras
- **Visitor registration** and supervision
- **Night lighting** for evening or early morning operations
- Regular **equipment inspections** to prevent sabotage or misuse

9. Machinery and Equipment Safety

- Conduct **daily inspections** of machinery (loaders, compactors, trucks)
- Use equipment **only as trained**
- Maintain **safe distances** from moving vehicles
- Always use **seatbelts** and other built-in safety systems

2.14 Project Description

Here's a well-structured **description of a landfill site under the Suthra Punjab initiative**, written specifically for inclusion in an **Environmental Impact Assessment (EIA) report**:

Project Description: Landfill Site under Suthra Punjab

1. Project Title

Development of Landfill Site under the Suthra Punjab Initiative – Hasilpur, District Bahawalpur

2. Project Overview

The proposed project involves the development and operation of a **sanitary landfill site** in Hasilpur Tehsil, District Bahawalpur, as part of the Government of Punjab's **Suthra Punjab (Clean Punjab)** program. This initiative aims to modernize solid waste management across all tehsils of Punjab, especially in underserved rural and semi-urban areas.

The landfill will serve as a **scientifically designed, environmentally controlled waste disposal facility** to replace existing open dumping practices. It will cater to the municipal solid waste (MSW) generated from Hasilpur city and its surrounding union councils, supporting safe, long-term waste containment and environmental protection.

3. Project Objectives

- To establish a **compliant and engineered landfill** system
- To minimize **soil, air, and water pollution** caused by unregulated dumping
- To align with national and provincial environmental laws, including PEPA 1997
- To support the **integrated solid waste management system** under Suthra Punjab
- To enable **future resource recovery** through methane capture and waste sorting

4. Site Location and Area

- **Location:** Near Hasilpur city outskirts, away from residential and sensitive ecological zones
- **Land Area:** Approx. 138 (subject to final design)
- **Access:** Connected to main roads for waste vehicle entry and exit

5. Design Features of the Landfill

Component	Description
Base Liner System	HDPE + clay composite liner to prevent leachate infiltration
Leachate Collection System	Network of perforated pipes to collect and drain leachate to treatment units
Gas Collection System	Passive or active methane gas vents or wells to prevent gas buildup
Waste Cells	Compacted layers of waste, daily covered with soil or geotextile
Perimeter Drainage	Prevents rainwater from entering waste cells
Weighbridge & Entry Gate	For tracking incoming waste and managing site access
Fencing and Security	To restrict unauthorized access and ensure operational control
Plantation Buffer Zone	Green belt to reduce odor and visual impact

6. Operational Details

- **Waste Capacity:** Designed for 4 years of projected waste from Hasilpur
- **Operating Hours:** 6 days a week, 8–10 hours daily
- **Waste Types Accepted:** Primarily municipal solid waste (MSW); hazardous, clinical, or industrial waste excluded
- **Monitoring & Maintenance:** Continuous monitoring of leachate, gas, and groundwater quality.

7. Alignment with Suthra Punjab Goals

- **Decentralized Waste Management:** Bringing landfill infrastructure to tehsil level
- **Environmental Sustainability:** Engineered design meets national EIA and waste standards
- **Public-Private Participation:** Option for outsourcing collection and transport services
- **Capacity Building:** Local staff training for operations and monitoring

8. Expected Environmental Benefits

- Elimination of open dumping sites
- Reduction in water and soil contamination
- Controlled methane emissions and potential gas-to-energy use
- Improved aesthetic, health, and environmental conditions for local communities

CHAPTER III

STATUTORY REQUIREMENTS

3.1 General

Sustainable development and green economy is a concept that has emerged over the past decades to describe a new framework aimed at economic and social development while maintaining the long term integrity of the ecological system and environmental resources. The principal of sustainable development is in the process of being incorporated into the national policy and legislation through various statutory instruments. This chapter describes the current legal responsibilities of the proponent in context of environmental and sustainable development, and the institutions that exist in the country that may influence the environmental management of the project.

This section deals with the current policy as well as legal and administrative framework related to carrying out of Environmental Impact Assessment (EIA) of the project. An efficient and effective organizational structure is essential for successful implementation of the mitigation measures identified for the project. Like other projects, the project, before its implementation, is required to go through an Environmental Assessment, in accordance with the provisions of the Punjab Environmental Protection (Amendment) Act 2012.

3.2 Existing Legislation and Legal Framework

The Federal Ministry of Environment was responsible authority for policy making on environmental protection in Pakistan but after 18th Amendment in the Constitution, the Provincial Governments have taken over the subject of Environment. This EIA study has been carried out in the light of the policy guidelines of the Preparation of IEE/EIA Reports under the procedures and practices formulated by the Pak EPA and adopted by the Punjab Environmental Protection Agency (EPA).

3.3 Institutional Setup

3.3.1 Environmental Protection Councils

The Punjab Environmental Protection Council (PEPC) is the apex decision-making body of Punjab. It has been developed under the provision of Punjab Environmental Protection (Amendment) Act 2012. It is headed by Chief Minister of Punjab with other members. The purpose of EIA is basically to obtain Environmental Approval from the Environmental Protection Agency (EPA), Punjab in compliance with Pakistan Environmental Protection Act (PEPA) - 1997, now having been replaced by Punjab Environment Protection (Amendment) Act 2012.

3.3.2 Environmental Protection Agencies

Pak EPA has been established at the Federal level and EPAs are established at Provincial level also. In Punjab an independent Environmental Protection Agency is constituted headed by the Director General.

3.3.3 Environment Protection Department, Punjab

The Punjab Government has established Environment Protection Department (EPD) administratively controlled by the Secretary, Government of Punjab. The EPD has its independent Minister. According to the provisions of the Punjab Environmental Protection (Amendment) Act, 2012, EPD has a significant role in policy making and implementation of the environmental laws in the Punjab Province.

3.3.4 Relevant Legal / Institutional Framework

The applicable laws for the environmental study of the project are briefly given below. The proponent of the project will abide by the applicable laws and regulations.

A number of laws have been promulgated by the Government of the Pakistan to deal with the environmental and social aspects related to the implementation of various development projects in the country. In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) that was replaced by the PEPA, 1997, through an Act of Parliament. According to the 18th Amendment in Constitution, the

PEPA 1997 has been confined to Federal Area and provinces have been allowed to formulate their own environmental legislation in the subject of environment.

Under the PEP Act, it is mandatory to carry out IEE or EIA for all development projects. The Pak EPA has also framed guidelines for environmental assessment of projects in various developmental sectors, According to 1997; the Punjab Environmental Quality Standards (PEQS) were established for effluents discharges and gaseous emissions of various Municipal and Industrial sources. The latest revision of NEQS as carried out in year 2022.

Provincial Environmental Protection Departments are also working on the formulation and enforcement of environmental statutes and by-laws. The Pak EPA has issued several policies guidelines and adopted measures for streamlining the environmental assessment. Though, the need for environmental screening and assessment has received some weight during the recent past, strict implementation of the NEQS is still a dream to be realized. The applicable laws for the environmental study of the Project are briefly described below:

3.4 Pakistan Environmental Protection Order (PEPO) 1983

In 1983, the Government of Pakistan issued an Environmental Protection Ordinance (EPO) 1983. It was the first legislation promulgated for the protection of environment. According to PEPO, 1983 it was necessary to carry out IEE / EIA for all development projects, but there were no IEE / EIA regulations under that ordinance.

3.5 Punjab Environmental Protection (Amendment) Act 2012

Section 12 of the Punjab Environmental Protection (Amendment) Act 2012 makes it mandatory for the proponent of a project to file with the Environmental Protection Agency either an Environmental Impact Assessment (EIA) or Initial Environmental Examination (IEE) , as the case may be, in respect of the project.

As per definition given in the Punjab Environmental Protection (Amendment) Act 2012, Environmental Impact Assessment (EIA) means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory, and compensatory

measures, formulation of environmental management & training plans & monitoring arrangements, and framing of recommendations and such other components as may be prescribed. The provision of Section 12 has been incorporated "as it is" in the new Punjab Environmental Protection (Amendment) Act, 2012.

3.6 National Environmental Policy 2005

Government of Pakistan has notified National Environmental Policy 2005, for different projects/aspects in which guidelines/priorities have been given to undertake/commence the projects having significant environmental impacts.

The National Environmental Policy (2005) provides a framework for addressing the environmental issues (particularly pollution of fresh water bodies and coastal waters, air pollution, lack of proper waste management, deforestation, loss of bio diversity, desertification etc.) confronting Pakistan. It recognizes the goals and objectives of the Pakistan National Conservation Strategy (PNCS, 1992), National Environmental Action Plans, and other existing environment related national policies, strategies, and action plans. It also provides broad guidelines to the Federal Government, Provincial Governments, federally administrated territories and local governments to address their environmental concerns and to ensure effective management of their environmental resources.

3.7 Review of IEE / EIA Regulations 2022

The Pak EPA has issued Review of the Environmental Impact Assessment (EIA) and Initial Environmental Examination (IEE) Regulations 2022, to review the Environmental Impact Assessment (EIA) / Initial Environmental Examination (IEE) reports. Categorization of the projects for IEE and EIA is one of the main components of the Regulations. Projects have been classified on the basis of expected degree of adverse environmental impacts. Projects type listed in Schedule I are designated as potentially less adverse effect, schedule I projects require an IEE and projects given in schedule II require EIA to be conducted.

Salient features of the Regulations are listed below:

- Categories of project requiring IEE and EIA are issued through two schedules attached with the regulations.
- A fee depending on the cost of the project has been imposed for the review of IEE and EIA.
- The submittal is to be accompanied by an application in prescribed format included as Schedule IV of the Regulation.
- The EPA is required to issue conformation of compliance within 15 days of receipt of request and complete documentation.
- The IEE / EIA approval for construction of the project will be valid for three years from date of accord.

3.8 Guidelines for the Preparation of IEE/EIA Reports

The Pak EPA has also framed Guidelines for the Preparation of IEE / EIA of projects in various developmental sectors.

3.9 The Punjab Local Government Ordinance, 2001

Schedules 4 and 8 of this Ordinance pertain to environmental pollution. There are not withstanding any specific provisions, every local government may perform functions conferred by or under the Punjab Local Government Ordinance, 2001, and in performance of such functions may exercise such powers, which are necessary and appropriate. Under the ordinance, the local councils are authorized to restrict projects causing pollution to air, water or land. They may also initiate schemes for improving the environment.

3.10 Pakistan Penal Code, 1860

This defines the penalties for violations concerning pollution of air, water bodies and land. Sections 272 and 273 of this Act deal with the adulteration of food or drink. Noise pollution has been covered in section 268, which defines and recognizes noise as a public nuisance. "A person is guilty of a public nuisance who does any act or is guilty of an illegal omission which causes any common injury, danger of annoyance

to the public or the people in general who dwell or occupy property in the vicinity, or which must necessarily cause injury, obstruction, danger or annoyance to persons who may have occasion to use any public right".

3.11 The Land Acquisition Act, 1894

The Land Acquisition Act (1894) deals with the acquisition of private properties for public purposes. There are 55 sections in this Act mainly dealing with area notification, surveys, acquisition, compensation, apportionment awards, disputes resolution, penalties and exemptions.

Although quite old, this act laid out the legal basis for any property affected by a project and for compensating the effected owners of the land.

3.12 Factories Act, 1934

The clauses relevant to the project are those that concern the health, safety, and welfare of workers, disposal of solid waste and effluent and damage to private and public property. The Factories Act also provides regulations for handling and disposal of toxic and hazardous materials. Given that construction activity is classified as ‘industry’, these regulations will be applicable to the project contractors.

3.13 Labor Laws

Construction and operational activities during the course of construction may affect occupational health of workers. Employers are required to abide by labor laws in respect of their own employees and also to ensure that contractors to follow the relevant labor laws and rules relating to safety of the workforce and creating a healthy working environment. The proponents shall ensure that the labor force engaged at the project site is not exposed to any danger by monitoring the contractor’s work frequently.

CHAPTER 4
DESCRIPTION OF THE ENVIRONMENT

4.1 GENERAL

The existing environment around the site of proposed project has been studied with respect to physical, ecological and socio-economic resources. The existing information to establish a database for the EIA of the project was collected from different departments, review of previous studies and through the site visits carried in out in the project area.

4.2 PHYSICAL ENVIRONMENT

The study examines the physical resources, topography, soil, climate, surface and ground water and geology is of not only the project site but also the city as whole to assess whether the project under review can or does impact on any of these parameters. The description of physical environment of District Bahawalpur and the project site is present in the following sub sections.

4.2.1 Geological Formation

Bahawalpur city lies just south of the Sutlej River, is the site of the Adam wahan Empress Bridge, the only railway bridge over the Sutlej in Pakistan. It is a fertile alluvial tract in the Sutlej River valley that is irrigated by floodwaters, planted with groves of date palm trees, and thickly populated forests. The district is land marked from all the sides. In the south and south east the Cholistan reaches the Indian boarder whereas in the north it runs parallel to the southern part of the Punjab plains and river Sutluj makes a common border with the Lodhran and Muzaffargrah districts.

The district can be divided into three main physical features i.e. (a) Riverine area, (b) plain area and (c) Desert area which is called Cholistan. The Riverine area of the district lies close on the river Sutluj which flows in the north along its boundary with Lodhran district and Vehari districts.

4.2.2 Climate

The climate of the city is hot and dry in summer and cold in winter. The summer season is lengthy which begins in April and continues till October for about seven

months. The hottest months are May, June and July. The winter is pleasant. The coldest months are

4.2.3 Temperature

The mean maximum and minimum temperatures during summer period are 42 and 29 degree centigrade respectively. During winter period the mean maximum and mean minimum temperatures are 21 and 5 degree centigrade respectively.

4.2.4 Rainfall

Most of the rain falls during monsoon season from July to September. Winter rain is very scarce. Annual rainfall is about 16 centimeters.

4.2.5 Topography

Bahawalpur is located south of the Sutlej River and lies in the Cholistan region near the Thar Desert. The city is well connected to the major cities Multan (90 km), Lahore (420 km), Burewala (122 km), Vehari (90 km), Faisalabad (270 km) and national capital, Islamabad is about 700 km

4.2.6 Water Resources

- **Surface Water**
- **Ground Water**

  Ground water in the Municipal area is generally saline except along the irrigation canals and the river.

4.2.6.1 Drinking Water Quality

Drinking water supply situation of Bahawalpur is much below as compared to all other cities; the service coverage is about 3% of population. The city faces similar issues related to drinking water supplies i.e Low coverage ratio, Poor water quality delivered to users, Illegal connections, not enough trained and qualified staff, the water quality is reported to be poor.

The water supply network in Bahawalpur covers 10% of the town and 3% of the population and the water quality is reported to be very poor. PCRWR carried out a survey of major cities in the Punjab among which was Bahawalpur. The results of the survey indicated that around 24% of the sampled water was polluted with

E.Coli, 52% samples were found to be contaminated with Coliform bacterium, and 76% possessed excess Arsenic (As) - most of the samples contained more than 50 ppb which is 5 times more than the limits set by the WHO. PHED is presently executing Rehabilitation and Augmentation of Urban Water Supply Scheme Bahawalpur City. Additionally, in 2006 the World Bank and the Government of Punjab developed an "Urban Water and Sewerage Reform." Plan .However, there is still no overall water supply plan has been developed

4.3 BIOLOGICAL ENVIRONMENT

The fauna and flora of the area include: the most common animals in the city include the hog deer, ravine deer, black buck and blue bull. Fox, jackals, hares, wild boars, porcupines, mongoose, arks, owls and hawks are also found in large numbers.

4.3.1 Flora

Trees, also called the 'lungs' of the earth, are important for the restoration of the eco-system. People can benefit immensely from their survival and existence. Trees have also been a source of medicine for thousands of years and a refuge for various species of birds. Several species of the trees in Lahore are being used in medicines. Some trees of significant medicinal value are grown easily in the city.

The main crops which Bahawalpur is recognized for are Cotton, Sugarcane, Wheat, Sun Flower Seed, Rape/Mustard Seed and Rice. Bahawalpur Mangoes, Citrus, Dates and Guavas are some of the famous fruits exported out of the country as well as Onion, Tomato, Cauliflower, Potatoes and Carrot. Being an industrial expanding city the government has revolutionised and libertised various markets allowing the Caustic Soda, Cotton Ginning & Pressing, Flour Mills, Fruit Juices, General Engineering, Iron & Steel Re-rolling Mills, Looms, Oil Mills, Poultry Feed, Sugar, Textile Spinning, Textile Weaving and Vegetable Ghee & Cooking Oil industries to flourish.

Table: 4.1 Inventory of some Flora of District Bahawalpur

S.no	Common Name	Scientific Name
1	Indian Lilac	*Azadirachtaindica*L.
2	Chinese date	*Ziziphusmauritiana*Lamk
3	Yellow	*Terminalia chebula* Retz.
4	Temple plant	*Crataevaadansonii* DC.
5	Bombax	*Bombaxceiba* Linn.
6	Bistula	*Cassia fistula* Linn.
7	India laburnum	*Acacia nilotica*(Linn.)Delile.
8	Indian banyan	*Ficusbenghalensis* Linn.
9	Buddha tree	*Ficusreligiosa* Linn.
10	Benzoil tree	*Moringaoleifera*Lam.
11	Devil tree	*Alstoniascholaris*(L.) R.Br.
12	Rosewood	*Dalbergiasissoo*Roxb.
13	Mango	*Mangiferaindica* L.
14	Spanish cherry	*Mimusopselengi* L.
15	Jujube	*Ziziphuszizyphus*Mill.

4.3.2 Fauna

The most common animals in the city include the hog deer, ravine deer, black buck and blue bull. Fox, jackals, hares, wild boars, porcupines, mongoose, arks, owls and hawks are also found in large numbers. The Bahawalpur Zoo, one of the few zoos in Pakistan, is located in Bahawalpur. Spread over an area of several acres inside the city, it contains a variety of animal species, including Asiatic lions, Bengal tigers, hyenas, leopards, and peacocks. The zoo has a collection of 130 animals and 700 birds from tropical regions, particularly those found in the Cholistan region. The zoo occasionally breeds and supply animals to other zoos in the country. It also has an aquarium and zoological museum with stuffed rare birds and animals. Located 35 kilometres east of the city is the Lal Suhanra National Park, one of the few safari parks in the country housing large animals including lions and rhinoceros.

Table: 4.2 Inventory of some Fauna of District Bahawalpur

S.no	Common Name	Scientific Name
1	Intermediate Egret	*Egretta intermedia*
2	Indian-Pond Heron	*Ardeolagrayii*
3	Red-Wattled Lapwing	*Hoplopterusindicus*
4	Common Sandpiper	*Actitishypoleucos*
5	White Wagtail	*Motacilla alba*
6	Yellow Wagtail	*Motacillaflava*
7	Red-vented Bulbul	*Pycnonotuscafer*
8	House Sparrow	*Passer domesticus*
9	Common Myna	*Acridotherestristis*
10	Bank Myna	*Acridotheresginginianus*
11	Pied Myna	*Sturnus contra*
12	House Crow	*Corvussplendens*
13	Nectariniaasiatica	*Purple sunbird*
14	Black Drongo	*Dicrurusmacrocersusvieillot*
15	Black kite	*Milvus migransmigrans*
16	Blue rocky pigeon	*Columba livia*
17	Little brown dove	*Streptopeliasenegalensis*
18	White-breasted Kingfisher	*Halcyon smyrnensis*
19	Little Green Bee eater	*Meropsorientalis*
20	Golden-backed woodpecker	*Dinopiumbenghalense*
21	Hoopoe	*Upopaepops*
22	Pheasant-tailed jacana	*Hydrophasianuschirurgus*

Some birds and few animals like Buffaloes, cows, goats, donkeys, hens, rats, cats and dogs are present in the vicinity of proposed site. Some reptiles like lizards are also present. The only amphibian seen the project area is frog. No threatened or

endangered species are found in the project site. Similarly no wildlife is present.

4.4 SOCIO ECONOMIC ASSESSMENT

Social change is the consequence of almost any intrusion into the community life of any society. The intrusion can be in the form of any developmental projects or nonspecific, less tangible forms such as increased exposure to other cultures, technological changes and so on. The social change that results from intrusion into community life can also be beneficial, but can have undesirable or negative outcomes. Even that change in the long run may have positive effect on the social well-being of a community.

Social Impact Assessment is a methodology used for examining social change due to external sources, especially specific developmental projects, but also government policies, technological changes and social processes or anything that has a social impact.

The objectives of the given study are outlined as follow:

- To carry out the assessment of social impact.
- Acquire socioeconomic data to evaluate and identify the project interventions.
- Assess needs of community related environmental concerns.
- To assess adverse and beneficial socioeconomic and health impacts of the activity.
- To suggest remedial measures and solutions to improve socio economic conditions.
- To analyze socio economic conditions of community, with special reference to environment and conservation of natural resources.

4.4.1 Demographic Profile

The demographical profile of city shows that it became city in 1847, became tehsil in 1901, there are 18 UCs, and total area of the City is 96 Sq Km, total Population of the City (Population reported by Urban Unit) was 481,858 in1998, literacy rate of the City was 58.5%, average household size 7.1, annual growth rate during 1981-98 was 2.93 %.(District Census Report 1998). Present Projected population is 644,872.

Bahawalpur Cantonment also existed adjacent to Bahawalpur City. The cantonment area population was 51769 in 1998 and average growth rate was 3.62 during 1981-1998. The present projected population of Cantonment area is 79,322.

Saraiki is the local language, while Urdu and English are official languages used in various educational and government institutions.

4.4.2 Health facilities

In Bahawalpur Victoria Hospital has capacity of 1409 beds and addition two new blocks (cardiology and cardiac surgery block and urology center) this will add 200 beds. There are about 51 Private hospitals. These all produce about 3 tons hospital waste. This is either burnt or disposed openly in barren areas. On the issuance of notices by District Environment Officer the principal of Quaid-e- Azam Medical College (QMC) and Medical Superintend Bahawalpur Victoria Hospital are now trying to obtain funds for the installation of incinerator/ autoclave to dispose the hospital waste properly.

4.4.3 Educational Facilities

List of educational institutions in Bahawalpur

- Dominican Convent Higher Secondary School Bahawalpur.
- Government Sadiq College Women University.
- Islamia University Bahawalpur.
- Allied Schools, a project of Punjab Group of Colleges.
- The Educators.
- ILM Group of Colleges.
- Quaid-e-Azam Medical College.

4.4.4 Transportation and Communication

Presently Urban transport is becoming burning issue of Bahawalpur City, because of its rapid population and urbanization growth. It requires immediate attention to plan for present and future needs for urban transport services. Currently urban transport services in Bahawalpur are similar as have in other cities, like use of Motor Cycle Rickshaws, and Auto Rickshaws as urban transport.

No urban transport services are available except for motorcycles, rickshaws and auto

rickshaws. The effective capacity of the new road system is reduced by poor traffic management, poor compliance with traffic regulations and the mix of motorized and nonmotorized traffic.

Bahawalpur city lies south of the Sutlej River. It is situated in the south of Punjab province, 90 km from Multan, 420 km from Lahore, 122 km from Burewala, 90 km from Vehari, 270 km from Faisalabad and about 700 km from Islamabad. It is linked to these other cities by major railway and four sub-regional roads.

The road infrastructure in Bahawalpur is generally good for existing requirements. As with other cities under review, there are no signals on any Chowk and no urban bus or van services are available. Mixed motorised and non-motorised traffic increase congestion on roads.

Bahawalpur has its own airport built by the Dubai Civil Aviation Department. Bahawalpur Airport links the city with various Pakistani cities such as Dera Ghazi Khan, Islamabad, Karachi and Lahore with the national flag carrier, Pakistan National Airlines.

The airline has launched international flights to Dubai and plans to introduce more international destinations. There are also daily bus and train services to and from Multan, Lahore, Sukkur and Karachi.

4.4.5 Industrial Activities

The Punjab Small Industries Corporation (PSIC) has established a Craft Development Center for Cholistan area, outside Farid Gate, Bahawalpur from where handicrafts manufactured in Cholistan can be purchased.

The Most famous industries lying in this area include Fertilizer, Sugar, Cotton, and Textile, Beverages, flour & Cottage Industries. Fuji Fertilizer Company , Unilever , Jamal Din wali Sugar Mill, Hamza Sugar mill, Itehad Sugar Mills are the most important industries playing fundamental role in the economy of the area.

4.4.7 Water Supply

The water supply network covers 10% of the town and serves 3% of the total population. Presently PHED is executing rehabilitation and augmentation of Urban Water Supply Scheme for Bahawalpur City. This would help in drinking water supply

needs and increase in service coverage. Southern Punjab Basic Urban Services Project (SPBUSP) also helping in water supply service provision and expenditure has been made of Rs 414.203 million and physical progress is 93%.

4.5 Conclusion

Comparison of potential adverse and beneficial impacts of the project shows that project will prove to be beneficial for the inhabitants of the area. The project will provide job opportunities for the local inhabitants. Hence improve their socio economic status. Employment opportunities generated by the project will include workers, helpers and guards. The overall socio economic impact of the project is interpreted in relation to the existing environmental conditions.

The project, overall, does not have major adverse impacts on the existing environment and people with due implantation of the mitigation measures, there will be very insignificant adverse impacts on the socio economic environment. The project has more beneficial impacts on the socio economic environment than adverse impacts. In conclusion, it can be said that overall the project would have positive impacts on the socio economic status of the neighboring community inhabitants.

CHAPTER V

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

5.1 General

The potential environmental impacts related to the establishment of the project have been studied related to design, construction and operational stages of the Project. Environmental protection measures are recommended to eliminate adverse impacts on environment or to reduce them to an acceptable level within the prevailing legislative and regulatory framework. These Impacts are evaluated on the basis of magnitude, immediacy and sustainability. A careful consideration of project aspect, their potential environmental impacts and mitigation measures are proposed in this chapter.

Evaluation criteria are as follow:

- Magnitude: Type of impact (direct, indirect, and cumulative)
- Immediacy: Temporal extent (during construction, after construction)
- Spatial extent (local, widespread)
- Sustainability and Reversibility:
    - Mitigability (fully, partially)
    - Monitoring (fully, partially)

5.2 Environmental Problems Due to Project Location

1. Introduction

- Project Title: Development of Hasilpur Landfill Site
- Location: Hasilpur, Punjab, Pakistan
- Purpose of EMP: To ensure environmentally sound planning and management of the landfill site based on scientific and regulatory criteria during the site selection process.

2. Site Selection Overview

Site selection is a critical step to minimize environmental, health, and social risks. Key criteria considered:

2.1. Environmental Criteria

- **Away from surface and groundwater sources** (e.g., 500–1000 m buffer)
- **Low flood risk** area
- **Avoidance of wetlands, forests, and sensitive ecosystems**
- **Air dispersion modeling** to ensure minimal impact from landfill gas and odor

2.2. Social and Land Use Criteria

- At least **500 m away from residential areas**
- No schools, hospitals, or public facilities nearby
- Not on agricultural or high-value land
- Compatible with the local land use plan

2.3. Technical and Operational Criteria

- Suitable **soil type** (e.g., clayey soils preferred to prevent leachate migration)
- Adequate land area for future expansion (minimum 15–20 years capacity)
- Good access roads for waste transportation
- Stable topography for construction

Table 5.1. Potential Environmental Impacts & Mitigation (Related to Site Selection)

Sr. #	Environmental Component	Potential Impact	Mitigation Measure
1	**Water Resources**	Groundwater contamination	Site >500m from water bodies; use of HDPE liner and leachate collection system
2	**Air Quality**	Dust & odor emission	Site located downwind of settlements; buffer zones with vegetation
3	**Biodiversity**	Habitat disturbance	Site selected away from ecological

			sensitive zones
4	**Soil**	Soil erosion, leachate infiltration	Use of clay lining, proper drainage design
5	**Noise**	Traffic and machinery	Site away from populated zones; operation during working hours only
6	**Socioeconomic**	Public nuisance, property devaluation	Community consultation; proper fencing, access restrictions

The potential impacts assessed due to project location are change in land use pattern, pressure on the existing natural resources, natural hazards like floods, earth quake, changes in the socio-cultural patterns of the local community, local community displacement issues, and obstruction of accessibility to the community already residing in the locality. A detailed explanation of each potential impact is given hereunder in tabulated form is mentioned as following.

Here's a **basic EMP framework focused on site selection criteria and related management strategies** for the Hasilpur landfill:

Table 5.2: Environmental Management Plan (EMP) – Hasilpur Landfill Site (Based on Site Selection)

	POTENTIAL IMPACTS	**MITIGATION MEASURES**
1.	**Change in Land Use Pattern**	
	Any new intervention has its first and foremost impact of changing the land use pattern of the area. The impact of this nature is irreversible therefore site selection needs to have careful consideration of the impacts that may arise due to the changes in land use patterns.	Prior to selection of site, the project proponent has had careful consideration of site alternatives and hence due to current land use nature, price, and comparatively less environmental impacts the site was selected out of the two alternatives. Another factor adding to the feasibility of the proposed site was that it involved no displacement of local community, closeness to existing commercial hub and

		less energy consumption for transportation.
2.	**Pressure of Resources**	
	Yet another impact to be considered prior to site identification is the availability of already existing resources e.g. water, gas, electricity, etc. any new intervention can exert pressure and marginalize the existing community. This could eventually create a sense of deprivation among the already existing community and may eventually result in social unrest.	Considering this very important factor, the site identification was done after evaluating the extent of provision of resources. The water requirements, energy requirement, social services (identified in the previous chapters) were done and based on the availability of resources to meet the present and future demand, the mentioned site was identified.
3.	**Natural Hazards**	
	It is very important to assess the extent of damage any natural hazard e.g. earthquake, floods, landslides may cause. The geological formation of the capital territory is such that it has been categorized into earthquake zones.	The proposed site identified within environmentally /geologically safe and does not fall in any of the earthquake zones in which the capital territory is divided.
4.	**Displacement of Local Community**	
	Displacement of local community can tend to create social issues and aggravate negative feelings from the existing population towards the project.	The proposed project is planned on a site which has already been acquired by the proponent after going through its socio-culture, environmental and economic considerations. The land is an empty plot hence does not require local community displacement.
5.	**Accessibility Issues to the Local Community**	
	Another important impact considered was obstruction or changes in the patterns of transportation and increase travel time/distance for the local community.	The proposed project site is a vacant plot within boundary surrounding it from all sides and does not involve damage to any roads. Nature, size and scope of work also limit the extent of activities during

		construction as well as operational phases.
6.	**Presence of Sensitive Areas**	
	Development interventions can degrade the quality and life expectancy of ecologically, socially and historically sensitive areas.	There are not sensitive areas of any nature be it ecological, social or historical in the proposed area.
7.	**Availability of Existing Infrastructure and Services**	
	Unavailability of infrastructure can render the entire project void and impractical due to absence of important community infrastructure.	The proposed project is well connected to the rest of the city through major asphalt roads. Commercial buildings, housing societies, hospitals, clinic and transport facilities available hence making the location ideal for the said purpose.

5.3 Environmental Problems Due to Project Design

Environmental issues may also arise during project design phase which may cause potential threats to the overall project life is not considered timely.

Here's a detailed **Environmental Management Plan (EMP)** specifically focused on the **design phase** of the **Hasilpur Landfill Site**. This EMP outlines how environmental risks will be managed during the planning and design of the landfill infrastructure, including containment, leachate control, gas management, and buffer zones.

Environmental Management Plan (EMP) – Design Phase

Hasilpur Landfill Site

1. Introduction

- **Project Name:** Hasilpur Municipal Solid Waste (MSW) Landfill Site
- **EMP Focus:** Environmental management considerations during the **design phase**
- **Prepared for:** Municipal Committee Hasilpur
- **Prepared in line with:** Punjab Environmental Protection Act 1997 (Amended 2012), IEE/EIA Regulations 2022, and relevant design standards (e.g., WHO, USEPA, PEQS)

2. Objectives of the EMP for Design

- Ensure environmentally safe landfill engineering
- Prevent contamination of soil, water, and air through appropriate design
- Incorporate pollution control technologies
- Support sustainable and regulatory-compliant waste management infrastructure

Table 5.3 . Key Environmental Aspects & Design-Phase Mitigation Measures

Environmental Component	Potential Impact	Design-Based Mitigation Measure
Soil & Groundwater	Leachate contamination	- Use **composite liner system** (clay + HDPE geomembrane) - Design **leachate collection and treatment system**
Surface Water	Runoff carrying contaminants	- Design **stormwater drainage system** around landfill - Separation of leachate from stormwater
Air Quality	Methane and odor emissions	- Include **landfill gas collection system** (passive or active) - Provide **daily cover** in design
Biodiversity	Habitat disturbance	- Maintain **buffer zones with native vegetation** - Avoid ecologically sensitive design areas
Public Health & Safety	Vector breeding, fires	- Design for **daily soil cover** - **Fire control** infrastructure (firebreaks, water storage)
Land Stability	Slope failure,	- Proper **slope angle** (e.g., 3:1)

	subsidence	- Internal **drainage layers** to reduce pore pressure
Aesthetics & Nuisance	Visual impact, noise	- Design **perimeter fencing**, **landscaped berms**, **tree buffer**
Climate Resilience	Flooding risk	- Raise base level above **high flood level** - Integrate **climate-resilient infrastructure**

4. Design Components to be Included

a. Liner System

- **1m thick clay liner** (permeability $\leq 1x10^{-7}$ cm/s)
- **1.5 mm HDPE geomembrane**
- **Geotextile protection layer**

b. Leachate Management

- **Perforated HDPE leachate collection pipes**
- **Leachate sump and pump system**
- **Leachate storage tanks/evaporation ponds**
- Provision for **treatment (constructed wetlands or treatment plant)**

c. Gas Management

- Vertical **gas venting wells**
- Option for **flaring or energy recovery**
- Passive gas venting for small-scale facilities

d. Stormwater Control

- **Peripheral drainage channels**
- **Sedimentation basin** before discharge
- **Separated from leachate** system

e. Waste Cells

- Modular design for **phased filling**
- Bottom slope for **drainage (e.g., 2–5%)**
- **Daily and intermediate cover** materials defined

f. Buffer Zone

- Minimum **50–100 meters** wide green belt
- Native **drought-resistant trees and shrubs**

g. Infrastructure

- **Weighbridge**
- **Access road with turning radius**
- **Administrative office, monitoring station**
- **Boundary wall and gate**
- **Fire control system**

Table 5.4. Environmental Monitoring During Design Finalization

Parameter	Monitoring Tool	Frequency	Responsibility
Soil permeability	Lab testing	Once (pre-design)	Engineering consultant
Groundwater level	Borehole data	Pre-design	Hydrogeologist
Air quality (baseline)	Particulate monitoring	Pre-design	Environmental consultant
Flood risk	Hydrological study	Once	Civil Engineer / Consultant
Biodiversity	Site ecological survey	Once	Environmental NGO / Consultant

Table: 5.5. Institutional Responsibility

Stakeholder	Role
Municipal Committee Hasilpur	Project lead and implementing agency
Punjab EPA	Review and approve the design EMP
Design Consultant	Incorporate mitigation in engineering design

Environmental Consultant	Prepare and validate EMP and environmental assessment
Contractor	Execute design as per environmental specifications

7. Regulatory Compliance

- Punjab Environmental Protection Act
- PEQS (Punjab Environmental Quality Standards)
- Pakistan EPA Guidelines for Landfill Design
- Solid Waste Management Rules (2021)

8. Conclusion

The EMP for the design phase of the Hasilpur landfill ensures that critical environmental safeguards are integrated into the engineering plan. By adopting best practices in containment, drainage, gas control, and site aesthetics, the landfill will minimize long-term environmental and social impacts.

5.4 Environmental Problems Associated with Project Construction Stage

Here is a detailed **Environmental Management Plan (EMP) for the Construction Phase** of the **Hasilpur Landfill Site**. This plan focuses on minimizing environmental, health, and safety risks during the **actual construction activities** such as excavation, liner installation, infrastructure development, and access road construction.

Environmental Management Plan (EMP) – Construction Phase (Hasilpur Municipal Solid Waste Landfill Site)

1. Purpose of the EMP

This EMP outlines **measures to prevent, reduce, or control environmental impacts** arising during the construction phase of the Hasilpur Landfill. It ensures compliance with environmental regulations and promotes worker and community safety.

2. Construction Activities Covered

- Site clearing, grading, and excavation

- Construction of access roads and internal roads
- Installation of liners and leachate collection systems
- Gas venting system installation

Sr. #	Environmental Aspect	Potential Impact	Mitigation Measure
1	**Air Quality**	Dust from excavation, vehicle movement	- Water spraying on dry surfaces - Speed control of vehicles - Cover materials during transport
2	**Noise Pollution**	From machinery and construction activities	- Limit work to daylight hours - Use low-noise equipment - Provide PPE (earplugs) for workers
3	**Soil Erosion**	Due to clearing and grading	- Temporary sediment barriers - Stabilize exposed areas quickly
4	**Water Pollution**	Surface runoff and spills	- Proper stormwater diversion - Spill containment measures - Store fuels/chemicals away from drainage
5	**Waste Generation**	Construction debris, plastic, cement waste	- Segregate and reuse/recycle materials - Designate on-site waste storage area
6	**Biodiversity**	Habitat disturbance	- Avoid tree felling outside designated area - Restore vegetation in buffer zone
7	**Worker Safety**	Accidents, exposure to dust/noise	- Provide PPE (helmets, masks, gloves) - First-aid and emergency protocols

8	**Community Health**	Dust, noise, traffic risk	- Limit truck movement near schools/homes - Notify public before large-scale works

- Construction of administration block, fencing, and drainage systems

Planting of green buffer zones

Table 5.6. Potential Environmental Impacts & Mitigation Measures

4. Environmental Monitoring Plan (During Construction)

Parameter	**Monitoring Method**	**Frequency**	**Responsibility**
Dust Levels	Visual & PM10 monitoring	Weekly	Environmental Officer
Noise Levels	Sound level meter	Weekly	HSE Supervisor
Soil Erosion	Visual inspections	Weekly after rain	Site Engineer
Waste Disposal	Log sheets & inspection	Weekly	Site Supervisor
Water Runoff Quality	Sampling near outfalls	Monthly (if applicable)	Environmental Consultant

Table 5.7 Institutional Responsibilities

Agency / Team	**Responsibility**
Municipal Committee Hasilpur	Oversight and regulatory compliance
Contractor	Implementation of EMP on-site
Environmental Consultant	Environmental supervision, monitoring reports
Site HSE Officer	Daily EMP implementation, training, documentation
Punjab EPA	Compliance audit and enforcement

6. Training and Awareness

- Conduct **pre-construction environmental and safety training** for all site workers.
- Toolbox talks on:
    - Waste management
    - Safe machinery operation
    - Emergency response
- Display **environmental signboards and safety instructions** on-site.

5.8. Emergency Response Plan (ERP) During Construction

Hazard	Emergency Measure
Fuel or chemical spill	Use spill kit, isolate area, report to HSE
Injury or accident	Administer first aid, transport to nearest clinic
Fire incident	Use on-site fire extinguisher, alert fire department

8. Documentation and Reporting

- **Daily Site Log** – Dust, noise, complaints, accidents
- **Weekly Environmental Checklist** – Compliance with EMP
- **Monthly Report** – Monitoring results and incidents
- Submit reports to **Municipal Committee** and **Punjab EPA** as required

9. Legal Framework

This EMP aligns with

- **Punjab Environmental Protection Act, 1997 (amended 2012)**

- **Pakistan Environmental Protection Agency (PEPA) Construction Guidelines**
- **Pakistan Environmental Quality Standards (PEQS)**
- **Occupational Safety and Health (OSH) standards**

Conclusion

Effective environmental management during construction is crucial to ensure the Hasilpur Landfill is developed **sustainably**, with **minimal impact** on nearby communities and the environment. Proper training, monitoring, and compliance enforcement will ensure a safe and successful construction phase.

5.5 Environmental Problems Associated with Project Operations

Table 5.4 provides a detailed overview of the environmental aspects and subsequent environmental impacts that may arise during project operational phase. Appropriate mitigation measures are also proposed for the remedy of any such potential impacts.

Table 5.9: Environmental Impacts/Mitigation Measures during Operational Phase

Sr. #	Environmental Aspect	Potential Impacts	Mitigation Measures / Recommendations	Responsible Party	Monitoring Frequency
1	**Leachate Generation**	Groundwater & soil contamination	- Install & maintain leachate collection system - Regularly inspect liners - Treat leachate before discharge	Site Manager, Environmental Engineer	Monthly water quality testing
2	**Landfill Gas (Methane, CO_2)**	Explosion risk, air pollution, climate change	- Install gas collection vents or flaring units - Avoid open burning	Operations Manager	Quarterly gas monitoring

			- Monitor gas levels		
3	**Odor and Air Pollution**	Public complaints, nuisance to nearby areas	- Apply daily soil cover - Restrict organic waste exposure - Plant buffer vegetation	Site Supervisor	Weekly site checks, community feedback
4	**Vector & Pest Infestation**	Spread of disease, public health risk	- Spray insecticides or fogging regularly - Use nets or traps - Control stray animals	Health Dept, Site HSE Officer	Bi-weekly during monsoon
5	**Surface Water Pollution**	Contamination of canals, drainage	- Maintain stormwater drainage away from waste cells - Separate stormwater from 6leachate - Sedimentation basins	Site Engineer	Monthly (especially in rainy season)
7	**Soil Contamination**	Land degradation, loss of fertility	- Prevent leachate seepage with lined base - Avoid disposal of hazardous waste	Waste Management Authority	Bi-annual soil testing
8	**Noise Pollution**	Disturbance to local communities	- Limit operations to daytime - Maintain equipment regularly	Site Operations Team	Weekly noise level checks

9	**Fire and Explosion Hazards**	Safety risk, emissions	- Ban open burning - Equip site with fire extinguishers - Monitor gas pressure in cells	Safety Officer	Fire drill every 6 months
10	**Waste Scavenging**	Health risks to informal workers	- Fence the site - Prohibit unauthorized access - Provide PPE to authorized workers	Site Security, Municipal Committee	Daily site inspection
11	**Traffic & Transportation**	Accidents, noise, dust	- Maintain dedicated access road - Limit truck speed - Schedule trips during low-traffic hours	Transport Supervisor	Monthly vehicle log review
12	**Aesthetic Impacts**	Poor public perception, complaints	- Maintain clean working face - Use boundary walls and vegetation screens	Site Supervisor	Monthly community feedback review
13	**Community Health & Safety**	Disease outbreaks, injuries	- Conduct health check-ups for workers 14- Create emergency response plan - Establish public complaint desk	Health Dept, Municipal Committee	Quarterly health audits
	Record	Lack of	- Maintain logs of	Site Manager	Weekly

14	**Keeping & Reporting**	transparency or data	incoming waste, environmental parameters, incidents		updates, monthly reports to EPA

Table: 5.10 General Recommendations during Operational Phase

Area	Recommendations
Environmental Monitoring	Implement continuous air, soil, and water quality monitoring using PEQS standards
Regulatory Compliance	Ensure regular reporting to Punjab EPA and compliance with PEPA 1997 (amended 2012)
Public Awareness	Engage local communities via awareness campaigns, signage, and stakeholder meetings
Capacity Building	Train landfill staff on environmental management, emergency response, and safety protocols
Technology Integration	Use GPS-enabled truck tracking, digital logs, and environmental sensors where possible

Conclusion

Proper operation of the Hasilpur landfill site requires strict adherence to environmental safeguards, regular monitoring, and transparent reporting. These actions will ensure that the site minimizes its negative impact on human health, local ecosystems, and natural resources in District Bahawalpur.

Table: 5.11 Closure & Post-Closure Phase

Environmental Aspect	Potential Impact	Mitigation Measures / Recommendations	Responsibility	Monitoring
Site Stability	Subsidence, leachate movement	Final capping with geomembrane & clay; vegetation	Consultant	Quarterly for 2 years
Gas Emissions	Methane leaks	Continue gas	Municipal	Annual

		venting/flaring	Committee	monitoring
Groundwater Quality	Pollution risk	Monitor wells post-closure for 4 years	Environmental Dept.	Bi-annual
Land Use	Unplanned development	Convert to green area or solar farm	Local Gov.	As per land use plan

5.6 Potential Environmental Enhancement Measures

In order to enhance the environment, the following measures will be adopted:

1. Trees will be planted within the premises to beauty the surrounding area.
2. A special budget will be designated for the environmental improvement of the environment on annual basis probably 1 million. The administration will be responsible for spending of this budget. The team leader will prepare the inventory of environmental improvement activities and communicate it with the rest of the team for implementation.

5.7 Occupancy

Adequate number of staff will be employed to maintain various facilities and activities related to environment and resource conservation e.g. water supply, electricity and other wastewater management, security, green areas, repair and associated infrastructures etc. some employees to be engaged for the maintenance and repair will also reside within the proposed project.

5.8 Additional Considerations

It is very importance to plan a project after evaluating its cumulative socio-environment and cultural impacts. The project is planned after keeping all the parameters of environment, health and safety for site identification, design, construction phase and operational phase. That's why the cumulative impacts of the project are negligible.

CHAPTER VI

ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN

6.0 Background:

The purpose of developing this Environmental Management and Monitoring Plan (EMMP) is to provide a dynamic guideline to the concerned stakeholders to define details of who, what, where and when environmental management and mitigation measures are to be implemented besides providing the contractors and proponents better on-site environmental management control over the life of the project. The scope of this Environmental Management and Monitoring Plan includes the activities during construction as well as operational and eventually a decommission phase of the proposed project. However, to ensure the compatibility of the Environmental Management and Monitoring plan in accordance with the changing socio-cultural, economic and environmental factors, it would be used as a dynamic tool which means that the EMMP would undergo necessary no deifications to keep catering to the changing environmental needs of the proposed project.

Table 6.1: Users of this EMMP would include but not be restricted to the following:

Sr. #	EMMP Elements	End Users
1	Background	All stakeholders – internal and external Community groups Approval or consent authority e.g. EPA Punjab
2	Environmental Management	The management and supervisory staff of "landfill site at Hasilpur, District Bahawalpur" EPA Punjab
3	Implementation	The management and supervisory staff of "landfill site at Hasilpur, District Bahawalpur"

		Community groups, EPA Punjab
4	Monitor and review	The management and supervisory staff of "landfill site at Hasilpur, District Bahawalpur" and EPA Punjab

6.1 EMMP Context:

Being an environment conscious and law-abiding entity, "landfill site at Hasilpur, District Bahawalpur" has decided to identify, develop and implement an EMMP that identifies the environmental aspects of their project besides providing them a guideline to tackle any environmental issues that may arise in the future. Under the Punjab Environmental Protection Act, 1997 (Amended, 2012), conducting an IEE/EIA prior to commencement of a project is obligatory. This is further reinforced through the IEE/EIA Rules 2022. A more elaborated guideline for Environmental Report Writing further provides a step-by-step procedure for drafting of an IEE/EIA report. An Environmental Management and Monitoring Plan have been made a compulsory part of the IEE/EIA report under the same guidelines. It is for this reason that project has planned to meet pre-requisite of the Environmental Approval by drafting a meticulously planned EMMP.

6.2 EMMP Objective:

The primary objectives of this EMP are to:

- Prevent, minimize, and control adverse environmental impacts
- Ensure compliance with environmental laws and regulations
- Define roles and responsibilities for environmental management
- Provide a structured plan for environmental monitoring and reporting
- Promote health, safety, and environmental awareness among workers and local communities

6.3 Environmental Policy

"Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur" strives for environmental reverence which is why it has devised its environmental policy stating vision of the company towards environmental conservation. Our policy is:

1. to provide a modern yet sustainable and environmentally friendly working condition to its employees
2. conserve natural resources through adopting less waste policy
3. energy conservation through promoting environment friendly plant designs
4. to provide trainings to all employees to meet our environmental objectives

6.4` Environmental Management and Monitoring Plan Structure and Responsibility

Table 6.2: Roles and Responsibilities

Sr. #	Positions	Significance	Stage	Environmental Responsibilities
1	Proponent / Owner	Critical	Construction / Operations	• Oversee Environmental Policy and EMMP • Serve as primary contact to the regulatory authorities • Commit resources to achieve

				environmental objectives
2	All Employees	Critical	Construction / Operation	• Attend training and understand their roles in the implementation of EMMP • Understand the Environmental Policy / Objectives and act accordingly • Participate in the review of EMMP • Coordinate with the responsible authorities within the project to report any noncompliance to their Environmental Policy
3	Construction Supervisor	Critical	Construction	• Understand the environmental policy of the project • Operate in accordance with the environmental policy • Ensure reducing solid waste generation • Reduce water and energy wastage • Ensure all machineries /equipment are in good conditions • Ensure health and safety of the workers during construction phase
4	Maintenance Manager	Critical	Construction / Operation	• Understand the environmental policy of the project • Operate in accordance with the environmental policy • Ensure reducing the chances of increased solid waste • Reduce water and energy wastage • Ensure all machineries /equipment are in good conditions • Ensure health and safety of the workers during construction / operational phase

				• Provides health, safety and environmental awareness trainings to the staff
5	Administrative Person Deal with Environment Issues	Critical	Operational	• Understand the environmental policy of the project • Operate in accordance with the environmental policy • Ensure reducing the chances of increased solid waste • Reduce water and energy wastage • Ensure all machineries /equipment are in good conditions • Ensure health and safety of workers during operational phase • Receive health, safety and environmental awareness trainings • Prepare and maintain accidents/environmental risk records • Timely coordination with the responsible authority

6.5 Environmental Management Plan for "Landfill Site (A project by Suthra Punjab), Tehsil Hasilpur, District Bahawalpur".

Hasilpur Landfill site believes in sustainable resource management which is why it has developed a comprehensive Environmental Management and Monitoring Plan for its construction as well as operational phase.

6.5.1 EMP during Design and Planning Phase

Table: 6.3 EMP During Design and Planning Phase

Environmental Aspect	Mitigation Measures
Site Selection	Select site >500m from residential areas, water bodies, and flood

	zones
Layout Design	Include lined cells, leachate collection system, gas venting, and buffer zones
Drainage Design	Construct peripheral stormwater drains to avoid water accumulation
Buffer Zone	Establish 50–100m vegetative buffer zone with native species
Community Concerns	Conduct public consultations and address grievances during planning

6.5.2 EMP During Construction Phase

Table: 6.4 EMP During Construction Phase

Environmental Aspect	Potential Impact	Mitigation Measures	Responsibility
Air Quality	Dust generation	Water sprinkling, cover materials, vehicle maintenance	Contractor
Noise	Disturbance to nearby residents	Operate only during day; use low-noise machinery	Contractor
Waste Management	Construction debris	Reuse/recycle materials; proper disposal	Contractor
Soil Erosion	Loss of topsoil	Temporary drains; re-vegetate exposed soil	Contractor
Worker Safety	Accidents, injuries	PPE, safety training, site signage	Contractor / HSE Officer

6.5.3 EMP During Operational Phase

Table: 6.6 EMP During Operational Phase

Environmental Issue	Potential Impact	Mitigation Measures	Responsible Party
Leachate Generation	Groundwater contamination	HDPE liner, leachate collection & treatment, groundwater monitoring	Site Operator
Landfill Gas (Methane)	Explosion, air pollution	Gas vents/flaring, no open burning	Site Manager
Odor & Air Pollution	Nuisance to public	Daily cover, green buffer, deodorants if needed	Operations Team
Surface Water Pollution	Canal/drain contamination	Storm water drainage separation, leachate control	Engineer
Soil Contamination	Soil degradation	Ban hazardous waste, inspect liners	Environmental Officer
Vectors (flies, rodents)	Disease spread	Regular fogging, waste covering, trap setting	HSE Team
Noise Pollution	Disturbance	Daytime operations, maintenance of machinery	Operator
Fire Hazard	Infrastructure loss, air pollution	No burning, fire equipment, fire drills	Site Safety Officer
Public Health & Safety	Illness, complaints	Regular health camps, PPE for workers, grievance	Municipal Committ

		system	ee

6.5.4 EMP During Closure and Post-Closure Phase

Table: 6.7 EMP During Closure and Post-Closure Phase

Activity	Mitigation / Monitoring Measures
Final Capping	Multi-layer cap with clay, geomembrane, topsoil
Vegetation	Plant grass/trees to prevent erosion and improve aesthetics
Gas Management	Continue gas venting or flaring post-closure
Leachate Monitoring	Groundwater testing for at least 5 years
Site Use	Convert into green space, solar park, or public recreation area
Monitoring	Bi-annual environmental monitoring post-closure

6.5.5 Environmental Monitoring Plan

Environmental monitoring will be undertaken in accordance with the requirements of the environmental authority (EPA, Punjab) to ensure compliance to the National Environmental Quality Standards (PEQS) as and when required. Proponent has decided to spend 1 million PKR annually for sake of Environmental Budget.

Environmental monitoring will include parameters that will be mentioned in the Environmental Approval accorded by the Environmental Protection Agency, Punjab for its construction phase.

Table: 6.8 Environmental Monitoring Plan

Parameter	Method	Frequency	Location	Responsibility
Air Quality (PM, Odor)	On-site sampling	Monthly	Active face, boundary	Environmental Officer

Groundwater Quality	Lab analysis	Quarterly	Downstream boreholes	Consultant
Noise Levels	Decibel meter	Monthly	Boundary areas	HSE Officer
Leachate Volume & Quality	Flow meter, lab test	Monthly	Leachate tank	Site Engineer
Soil Quality	Laboratory analysis	Bi-annually	Within and around site	Consultant
Health & Safety Audits	Site inspection	Monthly	Entire facility	Safety Officer

6.6 Institutional Arrangement

Administration under the supervision of the maintenance manager will report directly to the proponent. The administration will consist of skilled personnel with expertise in health, environment and safety issues. Roles and responsibilities for the implementation of EMMP are further explained earlier under the head Roles and Responsibilities.

Table: 6.9 Institutional Arrangements and Responsibilities

Entity	Responsibilities
Municipal Committee Hasilpur	Project execution and oversight
Punjab Environmental Protection Agency (EPA)	Environmental compliance and monitoring
Environmental Consultant	Prepare EMP, conduct monitoring, assist in reporting
Contractor / Operator	Implement mitigation measures during

	construction and operations
HSE Officer (on-site)	Daily supervision of EMP implementation

6.7.1 Reporting

The proponent aims to provide timely, relevant and appropriately presented information to the concerned government authorities, local community surrounding the proposed project site on the environmental, health and safety performance of the project. The commitment would be met by record keeping and presenting it to the concerned authorities as and when required.

6.7.2 Staff Training

Staff training is important parameter that needs to be fulfilled adequately in order to ensure the successful implementation of environmental objectives. Keeping this fact under consideration, "Landfill site at Hasilpur, District Bahawalpur" will ensure that the employees, contractors and workers receive appropriate environmental awareness training. This will be obtained through a variety of methods including training sessions, formal/informal meetings and discussion and formal presentations. Environmental awareness training would take place at various stages of the persons concerned with the proposed project. This would occur at the induction of any new employee/contractor/workers and will be made a regular on-site feature. Records of training content and attendance will be maintained.

"Landfill site at Hasilpur, District Bahawalpur" would require the persons involved during construction as well operational phase to be aware of following responsibilities and equipment, maintenance detail:

1. Their roles and responsibilities (including environmental incident reporting)
2. The environmental impacts (potential and actual) of their activities during construction and operation
3. Natural hazards such as earth quake and floods etc.
4. The potential consequence of poor environmental performance
5. Site emergency plans and their execution procedures

Table: 6.10Capacity Building and Training

Topic	Target Group	Frequency
Waste handling and safety	Workers, operators	Quarterly
Emergency response (fire, gas leak)	All staff	Every 6 months
Environmental awareness	Community members	Annually
PPE and first-aid training	Field workers	Bi-annually

Table 6.11: Persons involved during constructional and operational phase to be aware of following responsibilities and equipment, maintenance detail:

#	Description	Responsibility	Who will be involved	Outcomes
1	Air Quality	Administration	All employees	• Better understanding of the health impacts associated with air pollution • Develop a monitoring and reporting system for air pollution • Third party involvement especially EPA approved labs will be decided under potentially harmful circumstances
2	SWM	Administration	Staff	• The staff will be trained to follow the principles of recycle, reuse, reduce and will be taught to follow solid waste segregation at source • Improved understating regarding health impacts associated with unplanned waste management

				• A monitoring and reporting system that would enable the supervisor to keep control of all unnecessary scattering
3	Wastewater	Administration	Employees but specific attention to the staff	• Improved understanding of the conservation techniques • Quality assurance through lab analysis, if need be, found • Overflow control in the drains through continuous cleaning
4	Noise	Administration	All employee	• Monitoring and reporting system for noise related issues if detected • Appropriate measures would be identified and implemented • Guidance to the employee on adopting good practices for noise and any other practice that otherwise could lead to environmental nuisance.
5	Firefighting	Administration	All employee	• Improved understanding of keeping a tab on all potential threats that could lead to fire hazards • Understanding on how to use the firefighting equipment • Understanding regarding emergency exits and use of fire point
6	Landscaping	Administration	Staff	• Improved efforts for maintaining the green belts and tree plantations
7	Accidental Spills	Administration	All staff	• Improved understanding regarding how to react during minor and major spills according to the

				measures identified

6.8 Environmental Audits and Reviews

"Landfill Site at Hasilpur, District Bahawalpur" will ensure conducting environmental audits to assess compliance with the conditions set under the environmental legislation and those mentioned by the EPA, Punjab during grant of Environmental Approvals. The objective of the environmental audit and review is to monitor and report both compliance and non-compliance with the statutes, EMMP and the conditions set under Environmental Approval. This would be done for both the construction as well as operational phase of the proposed project under the supervision of the administration.

6.9 Public Consultation

Social survey was held with the surroundings from the project area. They are pro project. They were of the view that the project will bring new income opportunities for the surrounding community ultimately helping in the reduction of poverty in the area to a greater extent. A sample of the questionnaire used for public consultation is attached along as **Annexure.**

Emphasis was placed on community awareness and perception about the proposed project. This was an important component of the entire study as social assessments are complementary part of environmental assessment. By and large, the people of the proposed project area are well aware of the project and can well anticipate the activities that would entail once the project enters its construction and operational phase. All of the respondents who participated in the public consultation process welcomed the proposed project considering it beneficial both economically and socially. According to their point of views, the proposed project would be really beneficial by providing medical facilities. People foresee this project as a positive precursor that would give rise to employment opportunities and small vendor's activities during construction phase. No opposition from the public was confronted for the project.

6.10 Compensation in Money Terms

The said project is situated in almost open area where already agricultural cum commercial activities are running. There will be no cutting of flora and no harm to fauna by this proposed project. There is no any structure or residence which will be damaged by proposed project so there will be no need for money compensation. Proposed project is environment friendly.

6.11 Replacement, Relocation and Rehabilitation

Proposed project will be done on the open plot where there is neither any population nor any structure. So, there will be no need for replacement, relocation and rehabilitation of said project. This will come in operational here and will work here in environment friendly manners.

6.12 Environmental Breakdown Structure (EBS)

Total Environmental Budget: PKR 1,000,000

Component	Description	Estimated Cost (PKR)
Environmental Monitoring	Quarterly sampling of air (dust/PM), water (leachate/groundwater), and noise	250,000
Personal Protective Equipment (PPE)	Gloves, masks, boots, vests, goggles for 20–30 workers	100,000
Leachate Monitoring & Sampling	Lab testing of leachate (COD, BOD, pH, heavy metals)	100,000
Fire & Emergency Response Setup	Fire extinguishers, first-aid kits, basic signage, emergency drills	80,000
Buffer Zone Plantation & Maintenance	Tree plantation (native species), fencing, and irrigation	100,000
Public Awareness & Signage	Awareness boards, safety signs, complaint redress mechanism	60,000

Environmental Training	HSE training, toolbox talks, emergency response sessions (quarterly)	60,000
Dust & Odor Control Measures	Water sprinkling, deodorants, operational face covering	80,000
Documentation & Reporting	Printing logbooks, monitoring records, annual environmental report	40,000
Waste Handling & Vector Control	Pest control (fogging), nets, daily cover materials	80,000
Contingency (10%)	For price fluctuations or unplanned environmental needs	50,000
Total		**1,000,000**

CHAPTER VII

STAKEHOLDERS CONSULTATION

General

Consultation with the stakeholders is a tool for managing two-way communication between the project sponsor and the affected public. Its goal is to improve decision-making and build understanding by actively involving individuals, groups and organizations, which have a stake in the project. This involvement increases project's long-term viability and enhances its benefits to locally affected people and other stakeholders.

Stakeholder consultation is a critical part of the environmental assessment process. It ensures transparency, promotes social inclusion, and provides an opportunity for affected persons and institutions to voice concerns, suggestions, or support for the project. This chapter outlines the methods, participants, key issues discussed, and responses collected during the stakeholder engagement process for the proposed **Hasilpur Landfill Site**.

In order to evaluate the socioeconomic and environmental impacts, field surveys are extremely essential. In addition to the surveys at the preliminary stage, consultation with the community and their active participation plays a vital role in successful implementation of the project. To identify the different types of stakeholders and ascertain their perceptions about the project were measured. A social impact assessment survey was conducted. Informal group discussions were also held as an additional tool for obtaining feedback from the stakeholders that are being discussed in the following pages.

Project: Hasilpur Landfill Site

Location: Hasilpur, District Bahawalpur, Punjab

Purpose: Stakeholder Engagement for Environmental and Social Considerations

Objectives of Consultation

Public consultation plays a vital role in studying the effects of the project on the stakeholders and in the successful implementation and execution of the project. Public involvement is a compulsory feature of environmental assessment, which leads to better and more acceptable decision-making. The objective of the consultation with stakeholders is to help verify the environmental and social issues that have been presumed to arise and to identify those which are not known or are unique to the operation of the project.

The important general objectives of the consultation process are:

- Information dissemination, education, and liaison
- Identification of problems and needs
- Collaborative problem solving
- Reaction, comment and feedback on the Project;
- Documenting mitigation measures proposed by the stakeholders

Proponent

The project is “Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur” and the proponent is Mr. Usman Haider S/o Fiaz Haider

The Responsible Authority

The management of “Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur” is the responsible for the impacts of their project.

Table 7.1: Responsibility of "Landfill Site (A project by Suthra Punjab), District Bahawalpur" administration

Sr. #	Positions	Stage	Environmental Responsibilities
1	Proponent / Owner	Operations/stitching	• Oversee Environmental Policy • Serve as primary contact to the regulatory authorities
2	All Employees	Operation/stitching	• Attend training and understand their roles Understand the Environmental Policy / Objectives and act accordingly • Coordinate with the responsible authorities within the project to report any noncompliance to their Environmental Policy
3	Operational Supervisor	Operational /stitching	• Understand the environmental policy of the project • Operate in accordance with the environmental policy • Ensure reducing solid waste generation • Reduce water and energy wastage • Ensure all machineries /equipment are in good conditions • Ensure health and safety of the workers during construction phase
4	Maintenance Manager	Operation /stitching	• Understand the environmental policy of the project • Operate in accordance with the environmental policy • Ensure reducing the chances of increased solid waste

			• Reduce water and energy wastage • Ensure all machineries /equipment are in good conditions • Ensure health and safety of the workers during operational phase • Provides health, safety and environmental awareness trainings to the staff
5	Administrative Person Deal with Environment Issues	Operational/stitching	• Understand the environmental policy of the project • Operate in accordance with the environmental policy • Reduce water and energy wastage • Ensure all machineries /equipment are in good conditions • Ensure health and safety of workers during operational phase • Receive health, safety and environmental awareness trainings • Timely coordination with the responsible authority

Methodology for consultation

The EIA Team carried out public consultations at various locations within and around the project site. The stakeholder's consultation during this phase of the work targeted the project area, administrative and private offices etc. near the project area:

- Selection of the stakeholders for consultation, reconnaissance of the project site and initial discussions with the neighboring villagers, drivers etc.
- Appraising the targeted stakeholders initially for the purpose of consultation and working out a schedule for holding regular consultation meetings
- Distribution of questionnaires to obtain opinions and concerns

- Meetings with the stakeholders through the participation of environmental consultants and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

Affected and wider community

The stakeholders contacted during the survey belonged to different categories of people as shown in the Table 5.2.

Table 7.2: Categories of Stakeholders Interviewed in the Project Area

Sr. No.	Stakeholder Category
1	Neighbor workers
2	Project workers
3	Potential Distributors

Issues Discussed

Following issues were discussed during the stakeholder consultation:

- Overall activities of the project operational phase
- Possible mitigation measures
- Benefits or implications of the project specifically for the local people

Findings of the Overall Discussion

- After making complete feasibility the site is being used for stitching activities.
- Project increases revenue generation for the Government
- It creates employment opportunities
- Local people should be given preference for employment in the project

Majority of people favored the project in a sense that the project overcomes the increasing needs of garments in market.

Socioeconomic Trends around the "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur"

" Socioeconomic status (SES) is an economic and sociological combined total measure of a person's work and of an individual's or family's economic and social position in relation to others, based on income, education, and occupation.

This chapter includes the information that how the present study has been conducted and what are the results of this socioeconomic survey in the surrounding areas of "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur".

Study Population

The target population was comprised of nearby factory area's workers around the project site of "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur".

Study Size

Therefore, approximately a total of 20 households of different socio-economic conditions were surveyed and their heads of households were our main respondents.

Study Instrument

Data collection tool was questionnaire; it was a 19- items based semi structured questionnaire.

Sampling Procedure for Questionnaire

Procedure Table: Socioeconomic Questionnaire

Before filling the questionnaire, respondents were fully assured that their data will not be disclosed. They were told about the purpose of study. They were also told if they have any problem to understand the questions in questionnaire can ask.

Statistics Measures

After preparing the questionnaire, field surveys were conducted. The data selected from questionnaire was analyzed by using SPSS version 16. The data collected with the help of questionnaire was analyzed in SPSS to get the descriptions of current study.

Table:7.3 feedback of stakeholders

Sr. #	Variables	Frequency	Percent (%)
1	Name & Address	-	-
2	Date	-	-
3	Address & CNIC	-	-
4	Age	89 (above 30 years)	89%
5	Education	93 (under matric)	92.8
6	Occupation	96 (Private jobs)	95.9
7	Marital Status	99 (married)	99
8	If married then no. of children	87 (> 4)	86.7
9	Total Family members	90 (< 5)	90
10	Religion	97 (Islam)	96.8
11	No. of earning members in family	88 (< 3)	88
12	Total income	97 (> 25 PKR)	96.3
13	Source of income	99 (Private jobs)	99
14	Experience of Diseases	67 (no disease)	67
15	If Yes, then nature of disease	37	

Written Feedback:

The majority people of the nearby communities are strongly in favor of the proposed project. They have the perspective of healthy future which will bring prosperity to their young ones. They also gave comments that these projects will pave the path of development. Stakeholders are in favor of this project because of this project jobs will be generated for local people. According to stakeholders, this is an Environment friendly project.

Study Areas

Somehow at surrounding and nearer factory area was visited for socio-economic aspects. Details of these sites are discussed below. These areas were surveyed by team of Ecosphiron Environmental Services as per requirement of socioeconomic survey for Initial Environmental Examination Report of "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur".

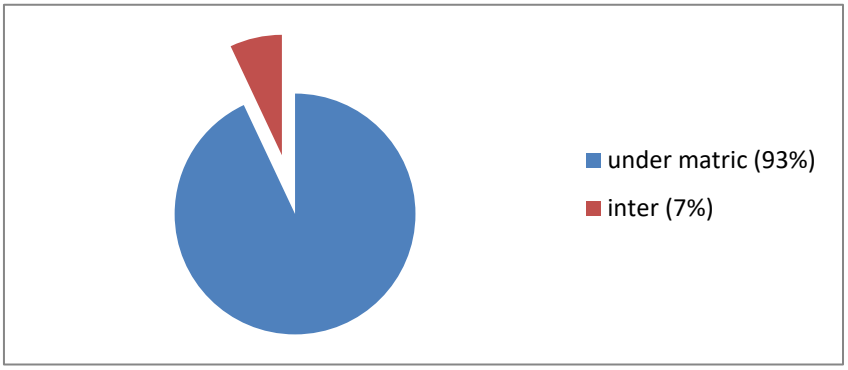
Description of Tables:

In the above table, only frequency and percentage has been measured (by SPSS) of those parameters which are probably present in maximum quantity.

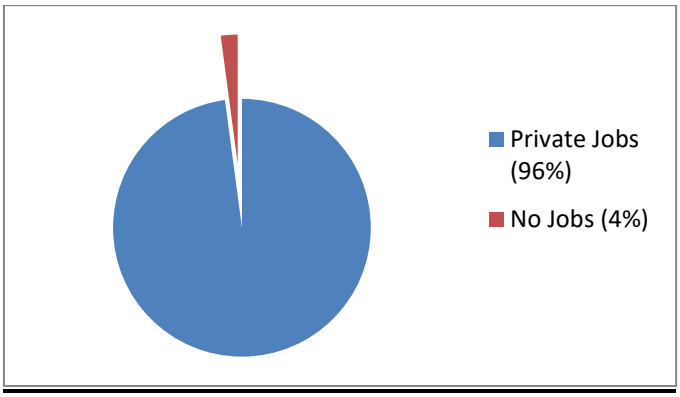
Table: 7.4 Key Concerns Raised by Stakeholders

Stakeholder	Concerns / Issues Raised	Response / Mitigation
Local Residents	Odor, water pollution, flies, land value decline	Site is >500m from residences, odor control and leachate systems planned
Farmers	Groundwater contamination and soil impact	Leachate containment and lined base to be installed
School Representatives	Health impacts on children due to gas and vectors	Vector control, gas venting system, buffer zone plantation
Waste Pickers	Restricted access may impact livelihoods	Awareness, PPE provision, possible integration in recycling
Local NGOs	Long-term sustainability and community involvement	Regular monitoring, public grievance mechanism planned
Municipal Committee	Budget constraints for environmental management	Low-cost EMP with phased improvements planned

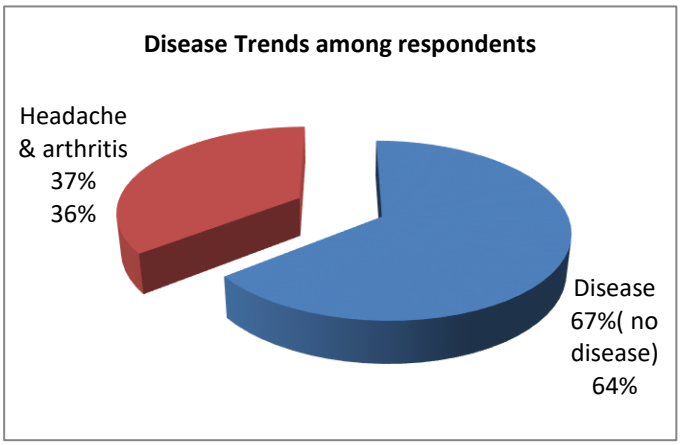
Site: "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur".



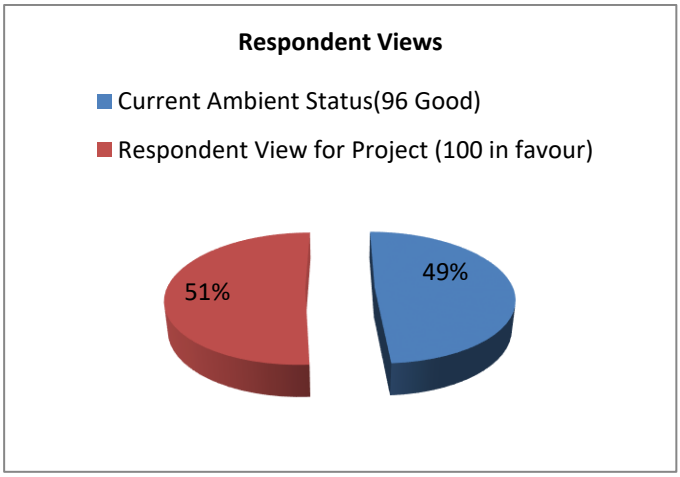
Graphical Presentation of Education around the Project Site



Trends of jobs around the project site



Health Status of Respondents



Respondent View about Project

Stakeholder Concerns and Recommendations

The finding of the community consultation has been addressed in various sections of EIA. Mitigation plan has been incorporated into EMP. The summary of consultation with various stakeholders is given below:

Project Approval

The community consultations demonstrated that goodwill towards the project proponent indeed exists. Approval for project activities by communities was evident. The consultations were considered a good gesture and were appreciated; especially by men and women. The poverty level is such that communities are looking forward to any project proponent to improve their financial well-being to a great extent. Benefit from the project should be distributed judiciously and equitably among the primary stakeholders in the project area, and the proponent will continue to ensure that this principle is followed in this project and community development program.

Local Employment

Communities in the project area emphasized that local inhabitants should be given priority when employing people for related works and activities according to their skills.

Other departments and agencies

Other departments and agencies such nearby schools and other educational institutes were also surveyed during whole consultation process. The suggestions and mitigation measures has been incorporated in the Environmental Management Plan.

Environmental practitioners and experts

Environmental experts were also considered as integral part of this consultation process of "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur".

The suggestions and mitigation measures has been incorporated in the Environmental Management Plan. The project is benefited for the local community and it will enhance the employment.

Recommendations from Stakeholders

- Plant trees around the site to reduce visual and odor impact
- Establish a helpline or complaint mechanism
- Include local people in monitoring committees
- Avoid burning waste
- Provide basic health services to landfill workers

These recommendations have been **integrated into the EMP** and design phase wherever feasible.

Information Disclosure

The project summary and consultation notices were:

- Shared on **notice boards** at the Municipal Committee Office
- Announced via **mosques and local cable**
- Verbal outreach by **UC officials**

Full EIA/EMP document will be made available at the Municipal Committee office and on request to the Punjab EPA.

Grievance Redress Mechanism (GRM)

A simple, accessible, and transparent **GRM** will be established:

- **Register available at site** for written complaints
- **Dedicated phone number** for voice/SMS complaints
- Complaints will be addressed within **7 working days**
- Quarterly summary of complaints and resolutions will be shared with the EPA and local community leaders

Conclusion

The stakeholder consultation process has been instrumental in improving the design, environmental safeguards, and social acceptability of the **Hasilpur Landfill Site**. Most stakeholders showed support for the project once they were informed of planned mitigation measures. Their feedback will continue to guide the **implementation and monitoring** phases..

CHAPTER VIII

CONCLUSIONS AND RECOMMENDATIONS

Title of proposed project is "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur" which will start construction immediately after getting environmental approval. The construction work will only take place during day time. In order to ensure compliance with the lawful provision of section 12 of PEPA 1997 (Amended 2012) read with IEE/EIA Regulations 2022, the Environmental Impact Assessment (EIA) Report has been prepared and is being filed to the Environmental Protection Agency, Lahore for issuance of environmental approval.

Accordingly, this EIA Report describes social, environmental, physical and other relevant aspects of the project during pre-construction, construction and post construction stage and at its regular occupancy. The report also specifies necessary measures to be adopted for mitigation of environmental impact on the environment. It also provides information as desired under the format used for the preparation of this EIA Report.

The project envisages at construction of "Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur". However, the environmental aspects and impacts associated with construction and operational phase have been considered. All infrastructure e.g., sewerage, water supply, electric supply, gas etc. already exist in the proposed project area. The proposed project will be an environmentally friendly site after its completion. Septic tank will be provided in the site premises for the treatment of domestic wastewater. Total solid waste generated from the project will comprise mainly of paper, plastics organic matter, medical waste, food waste and medical solid waste like syringes etc. The municipal waste will be ultimately collected by sanitary workers of that area from that point where it will be dumped while hazardous waste will be collected in safe and sealed form to eliminate the factor of hazard and in safely manners this waste will be shifted towards incinerator. The project will have its own administration set up for environmental monitoring and maintenance of site both during construction and

operation stage. In order to handle fire hazards, fire hydrants and sprinklers will be provided at many locations within the premises.

The baseline study has been conducted reviewing the available literature. The overall impact of the proposed project can be considered positive. However, it may pose some minor and moderate negative social which will be temporary and environmental impacts which will require proper mitigation measures.

Handling and disposal of construction waste, increase in noise level, air quality, traffic disruption and disturbance to people, workers safety, sanitation and solid waste disposal and effects on social life are vital factors during the construction stage that will require necessary mitigation measures which have been proposed in the report of this report. Responsibility for each of the mitigation has also been given in the report.

Construction of the proposed building will be a labor-intensive process and will create employment opportunities for the local people. At the operational stage, traffic management, wastewater and solid waste generation, and emergency response are the significant impacts that need to be managed. Mitigation measures and their responsibility for each of the mitigation have been given in the report. Emergency Response Plan will be developed and adequate measures to reduce, reuse and recycle paper waste will be adopted. The proposed mitigation measures will be strictly implemented to save the environment.

For the effective implementation and management of the proposed mitigation measures, an outline Environmental Management and Monitoring Plan (EMMP) has been developed.

This “Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur” will also be based on the principles of sustainable development. The aim of constructing “Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur” is to create an environment friendly design which should be kind to nature, healthy and sympathetic to the life style of its occupants.

- Energy Efficiency
- Water Conservation
- Use of Local Building Materials

- Materials will be used that permit the building membrane to 'breathe'.

8.1 Conclusion

In view of the above it has been concluded that “Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur”.

is environmentally friendly with sustainable design and has no adverse effects on environment. It is therefore requested to issue the environmental approval under section 12 of PEPA 1997 (Amended 2012) for the construction and operation of the said project.

8.2 RECOMMENDATIONS

The Environmental Impact Assessment (EIA) study and survey results are finally evaluated to recommend the following:

The present EIA Report of “Landfill Site (A project by Suthra Punjab) located at Rangeela Shah Darbar Road Tehsil Hasilpur, District Bahawalpur” meets the administrative and legal framework of the EPA Punjab.

- Implementation of EMP must be given top priority.
- During construction phase Create environmental awareness amongst the workers by training.
- Provide guidance to workers on use of PPEs and also make it compulsory for them to use PPEs during construction.
- Installation of fire extinguishers in the premises.
- Use of equipment with low operating noise levels within PEQS limits and regular monitoring of machines used during construction phase.