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ABBREVIATIONS

EIA	Environmental Impact Assessment
PEPA	Pakistan Environmental Protection Act
NOC	No Objection Certificate
EPD	Environmental Protection Department
PEQS	Punjab Environmental Quality Standard
LWMC	Sheikhupura Waste Management Company
NEQS	National Environmental Quality Standards
PEC	Predicted Environmental Concentrations
UPS	Uninterruptible Power Supply
WHO	World Health Organization
RWH	Rainwater Harvesting
CCTV	Closed-Circuit Television
RCC	Reinforced Cement Concrete
TDS	Total Dissolved Solids
HVAC	Heat, Ventilation and Air Conditioning
NEPRA	National Electric Power Regulatory Authority
PEC	Pakistan Engineering Council
HSE	Health, Safety and Environment
EHS & S	Environment, Health, Safety and Sustainability
LESCO	Sheikhupura Electric Supply Company
EMC	Environmental Management and Compliance

PROJECT SUMMARY

Section	Parameter	Details
1. Project Identification	Name of Project / M/S	Shaheen Orchard Housing Scheme
	Project Location	Mouza Bado Muraday Khurd and Sharaqpur Road Tehsil and District Sheikhupura.
	Geographical Coordinates	• **Latitude**: 31.68393788 N • **Longitude:** 74.0099712 E
2. Proponent Information	Proponent Name	Khalid Bashir Ahmad Khan Lodhi
	CNIC	35404-4516998-1
	Proponent Address	House No. 140-B, Muhalla Phase-1, Defence Housing Authority, Lahore Cant, District Lahore.
3. Project Overview	Total Project Cost	Rs. 500 million
	Project type	Extension in the Shaheen Orchard Housing Scheme- Sheikhupura
	Process Description	The proposed project involves the *extension of Shaheen Orchard Housing Society* over an additional area of **230 kanals**, adjacent to the already approved 671 kanals of the existing housing scheme. The extension area has been planned to accommodate residential plots, commercial zones, community facilities, and associated infrastructure such as internal roads, water supply, sewerage, drainage, and electrification networks. The project aims to expand the housing facilities within the same master layout to cater to the growing urban population while ensuring a well-planned and sustainable residential environment.

	Allied Facilities	The proposed extension area will include all essential allied facilities such as internal roads, sewerage and drainage networks, water supply and electrification systems, parks, mosques, educational and health units, and designated commercial areas. These facilities are planned to ensure a self-sufficient, well-organized, and sustainable residential environment within the housing scheme.
4. Waste Management	Types of Waste	The project will generate domestic solid waste, construction debris, and wastewater from residential and commercial activities.
	Estimated Waste Generation	6.67 Tons per Month
	Waste Handling Measures	Source segregation, appropriate Storage, Transport to disposal site
	Final Disposal Plan	Storage room
	Treatment Method	Septic Tank
6. Rainwater Harvesting	Harvesting Infrastructure	Storage Pits, (Septic Tanks)
	Collection Source	(Rooftop and Surface Runoff)
	Implementation Status	Planned
	Tree Types	Dalbergia sissoo, Acacia nilotica, Eucalyptus camaldulensis.
8. CSR & Community Welfare	CSR Budget	3% - 5% of Total Budget
	Activities	Environment & Sustainability Water, Sanitation & Hygiene (WASH) Livelihood & Skill Development Community Engagement

EXECUTIVE SUMMARY

This report provides Environmental Impact Assessment (EIA) conducted for Extension of the Shaheen Orchard Housing Scheme project, Mouza Bado Muraday Khurd and Sharaqpur Road Tehsil and District Sheikhupura. This project involves the development and operation of an additional 230 kanals as an extension of the existing Shaheen Orchard Housing Society, expanding the total area of the scheme. The proposed extension has been planned to include residential plots, commercial zones, community amenities, and allied infrastructure such as roads, sewerage, drainage, water supply, and electrification networks. This Environmental Impact Assessment (EIA) has been prepared to assess the potential environmental impacts of the proposed extension and to outline mitigation measures in accordance with the Pakistan Environmental Protection Act, 1997. The project aims to promote organized urban development and provide modern residential facilities while supporting the socio-economic growth of the surrounding area.

Project Overview

The proposed project involves the extension of Shaheen Orchard Housing Society over an additional area of 230 kanals, adjacent to the already approved 671 kanals of the existing scheme. The extension has been planned to include residential plots, commercial areas, community amenities, parks, mosques, and allied infrastructure such as internal roads, sewerage and drainage systems, water supply networks, and electrification facilities. The development aims to provide a well-planned, sustainable, and modern residential environment in accordance with contemporary urban planning standards. Basic utilities and supporting facilities such as solid waste management, security arrangements, and green landscaping will also be incorporated. The project represents a significant investment intended to promote organized housing and contribute to the socio-economic development of the area.

Project Proponent and Consultant

The project proponent Khalid Bashir Ahmad Khan Lodhi, has appointed **Pak Green Enviro-Engineering Pvt. Ltd.** as the environmental consultant to conduct the EIA report and obtain the necessary No Objection Certificate (NOC) from the Environmental Protection Department (EPD) Punjab. The consultant brings expertise in conducting environmental assessments and devising environmental management plan compliant with the **Punjab Environmental Protection Act (PEPA), 1997**, and **Schedule I** of the Punjab Environmental Quality Standards (PEQS).

Name and Details of Proponent:

Proponent	Khalid Bashir Ahmad Khan Lodhi
CNIC	35404-4516998-1
Residence	House No. 140-B, Muhalla Phase-I, Defence Housing Authority, Lahore Cant, District Lahore.

CNIC and other relevant documents are attached as **Annexure - A**.

Sheikhupura office:	Pak Green Laboratory (EPA Certified), 46 M, Sheikhupura III, Sheikhupura.
Contact:	+92-4235441444, +92-303-4442334
Email:	info@pakgreen.pk

Site Description and Environmental Setting

The proposed project site for the **extension of Shaheen Orchard Housing Society** is located adjacent to the already developed portion of the housing scheme, within District Sheikhupura. The area is characterized by flat terrain and stable soil conditions, making it suitable for residential and infrastructure development. The site is accessible through existing road networks connecting it to nearby urban centers and major transportation routes.

Air Quality: The ambient air quality in the area is generally good due to the presence of open agricultural and semi-urban surroundings. However, minor dust emissions may occur during construction activities such as land clearing, road preparation, and material handling, which will be controlled through water sprinkling and proper management practices.

Noise Levels: Existing noise levels are low to moderate, primarily from local traffic and nearby community activities. Temporary increases in noise may occur during construction due to equipment operation; therefore, construction will be limited to daytime hours and low-noise machinery will be used where feasible.

Water Resources: The project area primarily relies on **groundwater sources** through bore wells and community supply systems. Adequate arrangements will be made for domestic and construction water needs, while proper drainage and sewerage systems will be installed to prevent surface or groundwater contamination.

Ecology: The site mainly comprises vacant land and sparse vegetation, typical of peri-urban areas. No rare, endangered, or protected species were observed within the project boundary. To enhance the ecological value, plantation along internal roads, green belts, and parks will be carried out as part of the development plan.

Environmental Impact Assessment and Mitigation Measures

he **Environmental Impact Assessment (EIA)** identified potential environmental impacts during both the **construction and operational phases** of the housing society extension, along with suitable mitigation measures:

- **Air Quality Impacts:** Dust emissions from land leveling, road construction, and material handling will be controlled through regular water sprinkling, covered transportation of construction materials, and proper storage. All construction machinery and vehicles will be well maintained to minimize exhaust emissions.
- **Noise Impacts:** Construction noise will be mitigated by limiting work to daylight hours, using low-noise equipment, and maintaining a buffer distance from residential areas.
- **Solid Waste Management:** Construction debris and domestic waste will be collected and disposed of through the local municipal authority or a licensed waste contractor. Segregation of recyclable and non-recyclable waste will be ensured at designated collection points within the society.
- **Water and Sanitation:** Water for construction will be sourced from authorized groundwater or municipal supply. A proper sewerage system will be developed to collect and channel wastewater to the main drainage network. Stormwater drains will be designed to prevent surface runoff and localized flooding.
- **Health and Safety Protocols:** Construction workers will be provided with PPE, first aid facilities, and safety training. Safe working practices, warning signage, and emergency response plans will be implemented throughout construction and operation.
- **Green Spaces and Biodiversity:** The project includes the development of parks, green belts, and roadside plantations using native species to enhance aesthetics, reduce dust, and promote biodiversity within the residential environment.

Stakeholder Engagement and Public Consultation

A structured consultation process was carried out with local residents, nearby landowners, community representatives, and relevant local authorities to inform them about the proposed extension of Shaheen Orchard Housing Society and to gather feedback regarding its potential impacts. The stakeholders were generally supportive of the project, recognizing its contribution to organized housing development, improved infrastructure, and socio-economic growth in the area.

- Temporary noise, dust, and traffic disturbance during construction activities.
- Proper management of wastewater and solid waste during and after construction.
- Assurance of timely provision of utilities and maintenance of green spaces.

These concerns have been duly addressed through the proposed Environmental Management Plan (EMP), which includes mitigation measures for dust control, waste handling, noise management, and sustainable infrastructure planning. Overall, the community expressed a positive outlook toward the project, acknowledging its role in improving living standards and enhancing the residential environment of the area.

Environmental Management and Monitoring Plan (EMMP)

A comprehensive **Environmental Management and Monitoring Plan (EMMP)** has been developed to ensure environmental compliance throughout the construction and operational phases of the housing society extension.

Institutional Capacity and Training: Project engineers, contractors, and site supervisors will be trained in environmental management practices, including dust suppression, waste handling, occupational health and safety, and emergency response procedures.

Equipment Maintenance: All construction machinery and vehicles will be regularly inspected and maintained to minimize emissions, noise, and fuel consumption, ensuring compliance with NEQS standards.

Budget Allocation: A dedicated environmental budget will be allocated for activities such as waste disposal, environmental monitoring, plantation and green area maintenance, safety measures, and staff training programs.

Monitoring Schedule:

- **Air and Noise Monitoring:** Conducted quarterly during construction and bi-annually during operation to ensure compliance with environmental standards.
- **Water Quality Monitoring:** Regular sampling of groundwater and wastewater to ensure safe discharge and sustainable water use.
- **Solid Waste Management:** Monthly inspections of waste collection points and disposal practices.
- **Green Area Maintenance:** Periodic inspections of parks, green belts, and roadside plantations to ensure healthy vegetation and aesthetic upkeep.

CHAPTER-1: INTRODUCTION

1.1 Purpose of the Report

This section outlines the primary objective of the Environmental Impact Assessment (EIA), which is to assess the potential environmental impacts associated with the proposed 230-kanal extension of Shaheen Orchard Housing Society, District Sheikhupura. The purpose of this study is to ensure full compliance with the Pakistan Environmental Protection Act (PEPA) 1997 and the Punjab Environmental Protection (Delegation of Powers for Environmental Approvals) Rules, 2017. The EIA aims to evaluate potential environmental risks, propose mitigation measures, and promote sustainable development during both the construction and operational phases of the housing society.

This report provides a comprehensive assessment of the physical, biological, and socio-economic environment of the project area. It includes the evaluation of baseline environmental conditions, identification of potential impacts, formulation of mitigation strategies, stakeholder consultations, and preparation of an Environmental Management and Monitoring Plan (EMMP). The study ensures that the proposed development adheres to all relevant national environmental standards and regulatory requirements, facilitating environmentally responsible and compliant project implementation.

1.2 Identification of Project and Proponent

This section introduces the project titled "Extension in the Housing Scheme of Shaheen Orchard Housing Society", located in District Sheikhupura. The project involves the development of an additional 230 kanals of land as an extension to the already approved 671 kanals of the existing housing scheme. The proposed extension includes residential plots, commercial areas, community facilities, parks, mosques, and allied infrastructure such as internal roads, water supply, sewerage, drainage, and electrification networks. Basic amenities including sanitation, solid waste management, fire safety, and security arrangements will also be integrated to ensure a well-planned and sustainable residential environment.

1.3 Project Proponent

Proponent: Khalid Bashir Ahmed Khan Lodhi

Address: House No. 140-B, Muhalla Phase-1, Defence Housing Authority, Lahore Cant, District Lahore.

1.4Details of Consultant

Name of Consultancy: Pak Green Enviro-Engineering (Pvt.) Ltd.

Address: 46-M, Sheikhupura III, Sheikhupura.

Contact: 042-35441444, 0303-4442335

1.5 Nature, Size and Location of the Proposed Project

The following section highlights the physical characteristics of the proposed project. The extension of Shaheen Orchard Housing Society will cover an area of 230 kanals, adjacent to the already approved 671 kanals of the existing scheme. The development is residential in nature and does not involve any industrial or production activities. It will comprise residential plots, commercial areas, community amenities, internal road networks, and allied infrastructure such as water supply, sewerage, drainage, and electrification systems. The total estimated project cost is PKR 1.2 billion, which includes land development, infrastructure works, and provision of basic utilities and community facilities. Major facilities will consist of parks, mosques, schools, healthcare units, and commercial zones to support a self-sufficient and sustainable residential community.

1.5.1 Project Location:

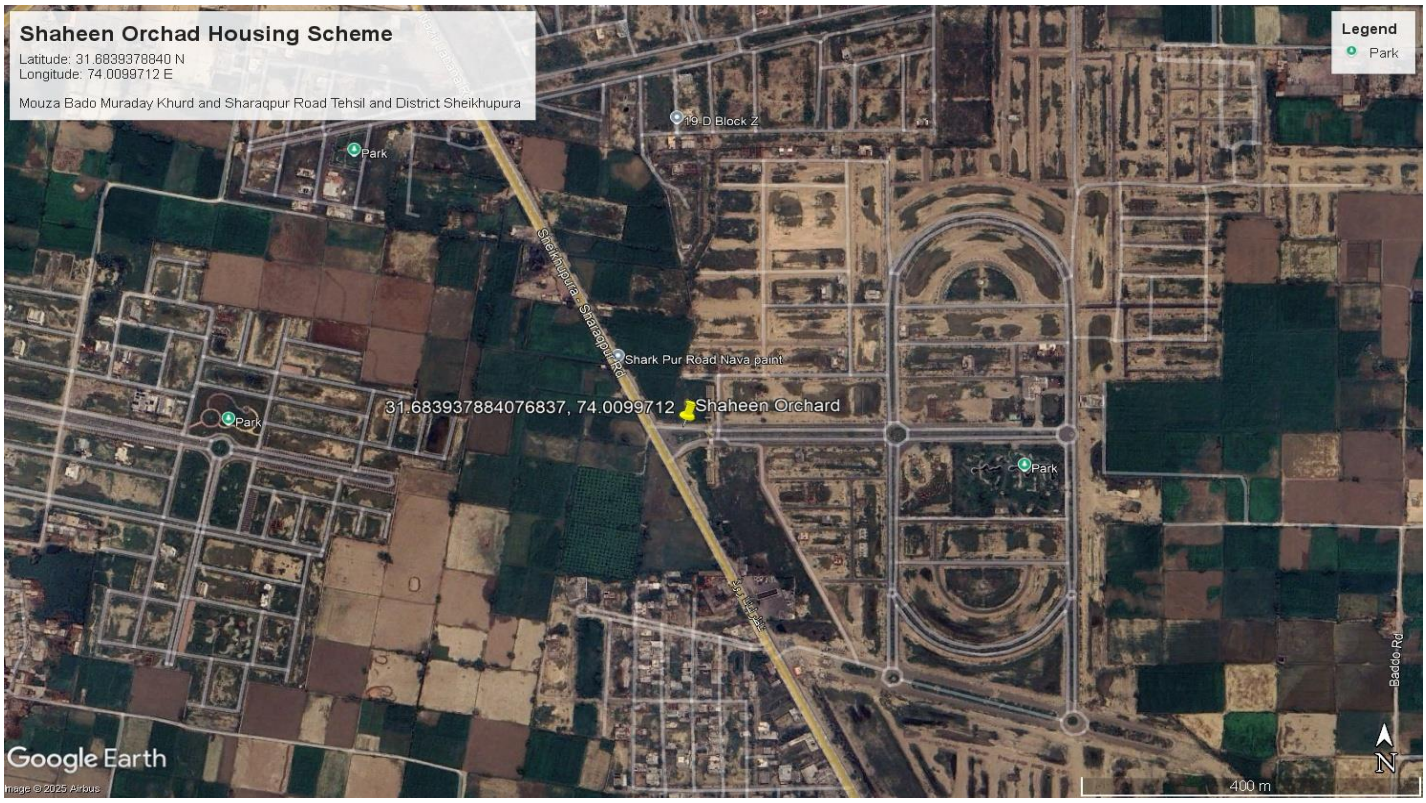
Mouza Muraday Khurd and Badoo Muraday, Sheikhupura, Sharaqpur Road, Tehsil and District Sheikhupura**.**

1.5.2 Land Coordinates:

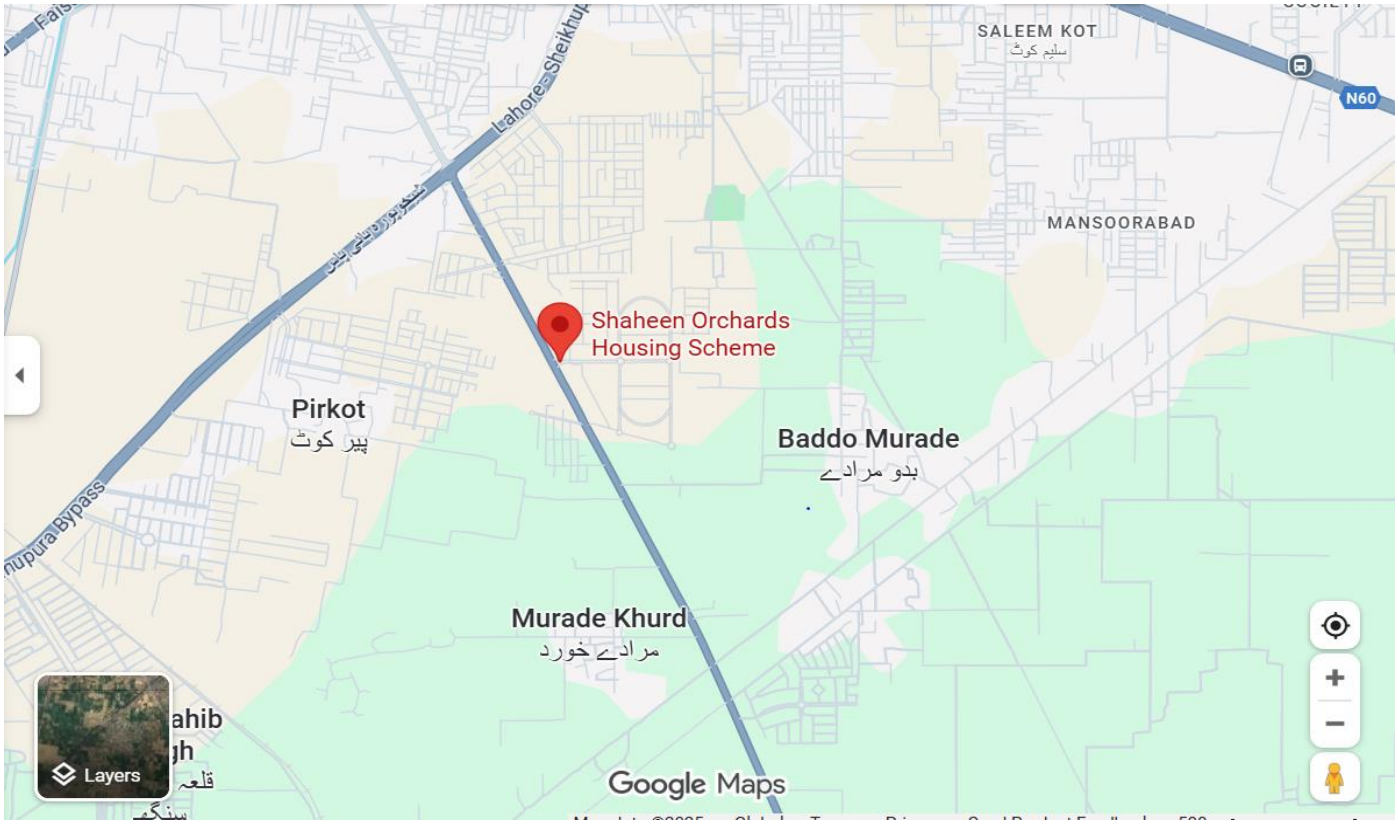
The geographical coordinates are

- **Latitude:** 31.6839378840 N
- **Longitude:** 74.0099712 E

1.5.3Google Map



Map Showing the pictorial evidence of Shaheen Orchard



1.6 Objective of the Report

The objective of this Environmental Impact Assessment (EIA) report is to identify and evaluate the potential environmental impacts associated with the proposed 230-kanal extension of Shaheen Orchard Housing Society and to recommend suitable mitigation measures to ensure environmentally sustainable development. This study has been undertaken to fulfill the environmental clearance requirements under Section 12 of the Pakistan Environmental Protection Act (PEPA), 1997:

- Identify and assess environmental impacts during construction and operation
- Recommend mitigation and enhancement measures
- Provide a decision-support document for the EPA
- Present an Environmental Management and Monitoring Plan

1.7 Extent of the Study

The extent of this study includes a comprehensive review of the master plan and layout for the proposed 230-kanal extension of Shaheen Orchard Housing Society, along with a physical inspection of the project site, collection of baseline environmental data, and detailed impact assessment for both construction and operational phases. The study also covers stakeholder consultations and the formulation of mitigation and management measures to minimize environmental impacts. Furthermore, it involves the examination of relevant environmental laws, regulatory requirements, and best practices to ensure sustainable planning, development, and operation of the housing scheme.

1.8 Methodology

A structured methodology was followed in the preparation of the EIA report, which includes:

Table 1.2: Structural methodology of EIA of the project

Step	Description
Regulatory Document Review	Studied relevant laws, NEQS, building by laws, and previous and EIA reports for similar urban projects

Site Visit	Visited the proposed site to assess land use, accessibility, utilities, and surroundings
Environmental Baseline Study	Gathered data on air quality, noise levels, soil, water availability, and vegetation at the site
Stakeholder Engagement	Consulted local residents, business owners, and municipal bodies for concerns and suggestions
Impact Identification & Evaluation	Assessed environmental impacts using qualitative tools and expert input
Preparation of EMP	Designed mitigation measures, monitoring plans, and institutional roles to minimize identified impacts

1.9 Screening of Potential Environmental Impacts and Mitigation Measures

The environmental impacts identified during the EIA are summarized below for both construction and operational phases:

Table 1.3: Screening of Potential Impacts and Mitigation Measures

Impact Area	Potential Impact	Mitigation Measure
Air Quality	Dust from excavation and materials	Water sprinkling, covering of loose material
Noise	Equipment and construction noise	Use of silencers, working in day-time hours
Solid Waste	Debris and packaging waste	Daily collection and proper disposal
Wastewater	Effluents from construction and washrooms	Installation of Septic tank with soakage pit
Traffic Disruption	Blockage due to material transport	Schedule transport during off-peak hours
Fire and Safety	Fire hazards during operation	Placement of fire alarm, extinguishers, emergency exits

1.10 Preparation of Environmental Monitoring Program and Institutional Requirement

A well-designed Environmental Monitoring Program (EMP) has been prepared to ensure effective implementation of mitigation measures during construction and operation. It outlines key environmental parameters, monitoring frequency, responsibilities, and corrective actions. The project proponent will oversee overall compliance, while the environmental consultant will handle monitoring and reporting. The site engineer and manager will manage daily implementation. To strengthen environmental performance, training and awareness sessions will be conducted for staff involved in construction and operations.

Institutional Roles

- **Project Proponent:** Holds overall responsibility for project implementation and ensures EPA for compliance with EIA requirements.
- **Environmental Consultant:** Responsible for preparing the EIA report, assisting with EMP implementation, and conducting periodic environmental monitoring and reporting during both the construction and operational phases.
- **HSE Manager:** Ensures day-to-day compliance with environmental mitigation measures at the construction site, including air and noise control, waste handling, and safety practices.
- **Operations Manager (Post-Construction):** Manages the building's waste disposal, rooftop garden, rainwater harvesting system, fire safety protocols during the operational phase.
- **Contractor & Workers:** Will receive training in safety, waste handling, fire response, and environmental good practices to ensure proper execution of assigned tasks.

To enhance environmental performance and ensure effective implementation of the EMP, capacity building workshops and awareness sessions are proposed for all personnel involved in construction and facility management.

1.11 Project Layout and Road Argument Plan

The layout plan of the proposed **230-kanal extension of Shaheen Orchard Housing Society**, Sheikhupura, has been developed by Shahid & Zahid Associates, a registered urban planning and engineering consultancy firm. The plan, titled *"Road Augmentation Plan"*, provides a

detailed representation of the project's spatial organization, sector division, and transportation network, ensuring systematic development in accordance with town planning and environmental standards.

1.12 Sector Division

The project area has been systematically divided into **four residential sectors**:

- **Sector A**
- **Sector B**
- **Sector C**
- **Sector D**

Each sector comprises residential plots arranged in a grid pattern with adequate access to internal and main roads. This zoning approach facilitates efficient land utilization, smooth traffic flow, and convenient access to community facilities within the housing scheme.

1.13 Road Network and Circulation

The housing scheme is structured around a **hierarchical road network**:

- **Main Boulevard (150 ft wide):** Serves as the central artery connecting all blocks and linking to the main Sheikhupura–Sangla Hill Road.
- **Secondary Roads (80–100 ft wide):** Distribute traffic between blocks.
- **Internal Streets (30–40 ft wide):** Provide access to residential plots.

Roundabouts and curved roads in the design ensure smooth circulation and minimize traffic congestion within the scheme.

The internal transportation system has been designed to ensure accessibility, connectivity, and safety for residents. The plan features a **hierarchical road network** consisting of main and secondary roads.

- **Main Roads (MR):**
    - Labeled as MR-01 and MR-02
    - **Widths:** 120–150 feet

  - **Purpose:** Serve as the primary circulation routes, linking the entire housing extension to the existing phases and external road network.

- **Secondary/Internal Roads (R):**
  - Numbered from R-01 to R-61
  - **Widths:** 30–40 feet
  - **Purpose:** Provide internal connectivity within each sector and ensure easy access to individual plots and community spaces.

A detailed table of road specifications is provided in the plan, listing the **road name, total length (ft), and width (ft)**. This structured design ensures smooth vehicular movement and reduces congestion risks

1.14 Accessibility and Connectivity

The project site is directly accessible from **Sheikhupura–Sangla Hill Road**, offering convenient approach to nearby urban centers. The connectivity ensures potential for economic growth and ease of transportation for residents.

A location map (shown on the layout plan) indicates proximity to key landmarks, confirming strategic positioning within the district's urban expansion zone.

The project is directly accessible from Sharaqpur Sharif Road, which serves as the main approach road to Shaheen Orchard Housing Society and its proposed extension. The road network is designed to integrate seamlessly with the existing infrastructure, ensuring smooth ingress and egress for residents and visitors.

1.15 Land Use Pattern

Although primarily residential, the layout includes designated spaces for:

- **Community Facilities** (e.g., parks, mosques, and open green spaces)
- **Commercial Areas** (located at road intersections for easy access)
- **Service Lanes and Utility Corridors** (for future installation of water supply, sewerage, and electrification networks)

This land use distribution promotes a balanced and sustainable community environment, encouraging green space inclusion and minimizing environmental pressure on the surrounding ecosystem.

1.16 Environmental and Design Considerations

The layout plan incorporates:

- Greenbelts and parks for air quality improvement
- Proper drainage and sewerage design to prevent waterlogging
- Space reservation for solid waste collection points
- Community facilities at walking distances to reduce vehicular movement

These planning features support the project's compliance with environmental standards and promote a sustainable residential environment.

CHAPTER-2: DESCRIPTION OF THE PROJECT

2.1 Type and Category of project

The proposed project involves the extension in the housing scheme of Shaheen Orchard, located in Mouza Moraday Kalan and Mouza Bando Moraday, District Sheikhupura. The project includes the development of additional residential and commercial plots, along with supporting infrastructure such as road networks, parks, utility services, and community facilities.

This project falls under Section 12 of the Pakistan Environmental Protection Act (PEPA), 1997 (XXXIV of 1997) and is categorized as Category H, Schedule II, Clause (01) of the Punjab Environmental Protection Act, 1997. Accordingly, this project requires the preparation and submission of an Environmental Impact Assessment (EIA) to assess potential environmental impacts and to ensure that appropriate mitigation and monitoring measures are incorporated during the planning, construction, and operational phases.

The assessment ensures that all development activities are carried out in compliance with the Punjab Environmental Quality Standards (PEQS) and other applicable environmental regulations to promote sustainable and environmentally responsible urban development.

The assessment ensures that environmental safeguards are in place during both construction and operational phases.

2.2 Objectives of the project

The primary objective of the proposed project is to extend and develop an additional 230 Kanals within the existing Shaheen Orchard Housing Scheme into a modern, well-planned residential and commercial area that meets current urban planning and environmental standards. The extension aims to complement the already developed portion of 671 Kanals and ensure integrated, sustainable community development.

Efficient Land Use: To optimize the use of available land by developing residential plots, commercial zones, and public facilities within an already urbanized boundary, thereby minimizing environmental disturbance associated with greenfield development.

Sustainable Infrastructure: To incorporate modern infrastructure such as paved roads, water supply systems, drainage networks, street lighting, solid waste collection points, and green

belts. The design ensures long-term functionality, safety, and environmental compatibility in line with sustainable urban development principles.

Promote Business Growth: To contribute to the socio-economic growth of the area by generating employment during construction and operational phases, attracting investment, and improving access to housing and commercial facilities for local communities.

Socio-economic Benefits: To provide essential allied facilities such as parks, mosques, schools, health centers, and recreational spaces that improve the living standards and promote a healthy community environment.

Promote Sustainable Urban Development: To ensure that the project complies with the Pakistan Environmental Protection Act, 1997, and the Punjab Environmental Protection Rules, 2017, through responsible planning, mitigation, and monitoring measures.

2.3 Alternative Considerations and Reasons for their Rejection

Alternative options were evaluated to ensure that the proposed extension within Shaheen Orchard Housing Scheme achieves optimal land utilization, minimizes environmental disturbance, and aligns with regional urban planning objectives

2.3.1 Activity Alternatives

The proposed project involves the extension and development of 230 Kanals of land within the existing Shaheen Orchard Housing Scheme to provide residential, commercial, and community facilities. No alternative activity was considered because the objective of the project is to complete the housing scheme in accordance with the approved master plan and meet increasing residential and commercial demand in the area. Any alternative activity, such as industrial or purely commercial use, would conflict with the designated land use zoning and the overall planning framework of the approved layout.

2.3.2 Alternative Location

No alternative site was considered for this project since the extension area forms an **integral part of the existing approved Shaheen Orchard Housing Scheme (671 Kanals)**. The selected 230 Kanals of land is contiguous with the developed portion and already benefits from nearby infrastructure such as **roads, utilities, sewerage networks, and public services**. Developing a separate site would require new infrastructure development, additional land acquisition, and potentially greater environmental impacts, particularly if agricultural or undeveloped land were utilized.

2.3.3 Selected Site

The proposed site is located within Shaheen Orchard Housing Scheme, situated at Mouza Moraday Kalan and Mouza Bando Moraday, District Sheikhupura, along Sheikhupura–Sharaqpur Road. The location is ideal due to its accessibility, proximity to existing developed sectors, and integration with the surrounding infrastructure network

2.3.4 Reasons for Rejection

Alternative activities and locations were rejected due to the site-specific nature of the proposed extension, cost-efficiency of utilizing already planned land, and compatibility with approved land use and zoning regulations. The proposed site ensures optimal use of existing infrastructure, minimizes new land disturbance, and supports sustainable housing development.

Accordingly, the selected site and proposed housing scheme extension were deemed the most practical, environmentally sound, and socio-economically beneficial options for achieving the project's objectives

2.4 Location and site layout of Project

The proposed extension in Shaheen Orchard Housing Scheme is located in Mouza Moraday Kalan and Mouza Bando Moraday, along Sheikhupura–Sharaqpur Road, District Sheikhupura, Punjab. The total area of the proposed extension covers 230 Kanals, which is being integrated with the already approved 671 Kanals of the existing Shaheen Orchard Housing Scheme, bringing the cumulative area to 901 Kanals.

The layout of the project has been strategically designed to ensure efficient land utilization, accessibility, and compliance with urban planning, safety, and environmental standards. The scheme is divided into multiple blocks (A, B, C, and D), each planned with a balance of residential, commercial, and community facilities.

Key components of the layout include:

- **Basement Facilities:** Plots of various sizes have been designated across all blocks to cater to different income groups, ensuring inclusivity and optimal land use. The residential design follows modern planning standards, with easy access to parks, roads, and community amenities.
- **Ground Floor (Executive & Admin Wing):** Commercial plots are strategically placed along main roads and intersections to provide convenient access for residents and

visitors. These areas are intended to accommodate retail outlets, offices, and service centers to meet local commercial needs

Road Network: An interconnected road system has been designed, ranging from 150 feet wide main boulevards to 30–40 feet wide internal roads, ensuring smooth traffic flow, accessibility to all plots, and linkage with the main Sheikhupura–Sharaqpur.

Parks and Open Spaces: Green belts, parks, and open recreational areas have been incorporated throughout the layout to promote environmental sustainability and enhance the visual appeal of the housing scheme

Public and Community Facilities: Dedicated areas are reserved for essential community amenities such as mosques, schools, healthcare centers, playgrounds, and a community club to serve the residents' daily and social needs.

Utility Infrastructure: The design includes provisions for water supply lines, sewerage and drainage networks, electricity distribution, solid waste collection points, and street lighting. Each block is planned to ensure efficient service coverage and environmental safety

Safety and Environmental Provisions: Stormwater drains, waste collection points, and tree plantation zones are included in the master plan to minimize flooding risk, control pollution, and improve air quality within the scheme.

The site layout has been thoughtfully planned to ensure efficient land utilization, ease of access, and full compliance with applicable environmental regulations. The layout includes several key components designed to support functionality, sustainability, and occupant comfort.

A detailed layout plan showing the division of blocks, road hierarchy, and allocation of residential, commercial, and amenity plots is attached with this EIA report.

2.5 Land use on site

The proposed project site is located within the existing Shaheen Orchard Housing Scheme, situated in Mouza Moraday Kalan and Mouza Bando Moraday, District Sheikhupura. The land designated for the 230-Kanal extension falls within an area already earmarked for residential and commercial development under the approved master plan of Shaheen Orchard.

The proposed development will include residential plots, commercial areas, roads, parks, and community facilities, consistent with the overall zoning and land use pattern of the existing housing scheme. There is no change in land use, as the proposed extension aligns with the

approved land use classification, LDA planning guidelines, and local development control regulations.

The project represents a planned expansion of the existing housing scheme to accommodate growing residential demand while ensuring balanced provision of commercial and community facilities. The land is free from agricultural, industrial, or ecologically sensitive uses, ensuring that the proposed development will not result in significant land conversion or environmental disturbance.

2.7 Vegetation Features of Site

The proposed extension area of 230 Kanals within Shaheen Orchard Housing Scheme lies in a semi-urbanized zone of District Sheikhupura, adjacent to already developed residential sectors. The site primarily consists of cleared and leveled land, previously used for agricultural or vacant purposes, with scattered grasses and sparse shrubs. No significant natural forests, mature tree cover, or ecologically sensitive vegetation exist within the project boundary.

Vegetation within and around the project area is mostly ornamental or seasonal, found along roadsides and in nearby developed sectors. The proposed development activities will therefore not cause the removal of mature trees or the disturbance of any natural habitats.

Under the housing scheme's landscape plan, the proponent intends to introduce organized green spaces, including parks, green belts, and roadside plantations, to enhance the aesthetic value and contribute to the local microclimate and air quality improvement.

2.8 Cost and Magnitude of Operation

The estimated total **project cost is PKR 500 million**, reflecting the construction and development of a five-story commercial building, including a basement and ground floor. The project is classified as moderate in scale in terms of both construction activities and operational impact.

2.9 Estimated Schedule of Implementation

The proposed extension in Shaheen Orchard Housing Scheme (230 Kanals) will be implemented in phases over an estimated period of 18 to 24 months. The phased approach ensures efficient resource utilization, compliance with environmental and structural standards, and minimal disturbance to the already developed portion of the housing scheme:

Months 1–3: Project Planning, Design Finalization, and Statutory Approvals

Months 4–6: Land Clearing, Earthwork, and Site Leveling

Months 7–12: Development of Road Network, Sewerage, and Water Supply Systems

Months 13–16: Construction of Stormwater Drains, Electrical Network, and Street Lighting

Months 17–20: Development of Parks, Green Belts, and Public Amenities (Mosque, School, Health Unit)

Months 21–24: Final Inspection, Plot Demarcation, and Handover for Allotment

This schedule is tentative and may be adjusted based on weather conditions, availability of materials, labour, and regulatory processes.

2.11 Description of the Project

The proposed project involves the extension of Shaheen Orchard Housing Scheme, covering an area of approximately 230 Kanals. The project aims to expand the existing residential community by developing additional residential plots, roads, utilities, and community facilities in line with the approved master plan and urban development regulations.

Table 2.2: Land Use Distribution and Major Components of Extension

Component / Zone	Facilities / Description
Residential Area	Residential plots of various sizes (5, 10 Marla, 1 Kanal, etc.) planned with proper access roads and green buffers.
Road Network and Infrastructure	Internal road network, streetlights, walkways, and stormwater drainage system.
Commercial Area	Designated plots for small-scale commercial activities to serve the residents (shops, grocery, pharmacy, etc.).
Public Buildings	Includes mosque, school, dispensary/health unit, and community center.

Parks and Green Belts	Landscaped parks, open green spaces, and tree-lined avenues for recreation and environmental enhancement.
Utilities and Services	Underground sewerage and water supply network, solid waste collection points, electricity and gas connections, and overhead/underground tanks.
Security and Support Facilities	Boundary wall, entrance gate, guard room, CCTV surveillance points, and fire safety arrangements.
Integrated Systems	Energy-efficient lighting, rainwater harvesting provision, solar-powered streetlights, and wastewater management system.

2.11.1 Salient Features of the Project

Table 2.3: Salient Features of the project

Feature	Details
Total Project Area	Approximately 230 Kanals
Project Type	Residential Housing Scheme Extension
Public Amenities	Mosque, school, health unit/dispensary, and community center for residents
Infrastructure Facilities	Paved internal roads, underground sewerage and drainage system, street lighting, and solid waste collection points
Sustainability Measures	Energy-efficient streetlights, green belts, and planned tree plantation drives
Safety Provisions	Gated entry, boundary wall, and fire safety arrangements for community security

Power Supply	LESCO (WAPDA) connection with provision for solar-powered lighting in selected areas

2.11.2 Water Requirements

The proposed extension of Shaheen Orchard Housing Scheme will require water for domestic use, green area maintenance, and community facilities such as the mosque, school, and parks. The average domestic water consumption in residential areas is estimated at 80–100 liters per person per day. Considering the projected population for the housing extension, the total daily water demand is estimated at approximately 150,000–180,000 liters per day.

Water will be supplied through a dedicated tube well system, supported by overhead storage tanks to ensure a consistent supply. Additionally, rainwater harvesting mechanisms will be introduced for irrigation of green belts and parks to promote water conservation.

As confirmed by the Irrigation Department (Rachna Drainage Division, Sheikhupura), the project area is not flood-prone, ensuring that water infrastructure remains secure and functional during the monsoon season

2.11.3 Wastewater Generation and Management

The proposed Shaheen Orchard Housing Scheme Extension will generate domestic wastewater primarily from residential units, community buildings, mosques, schools, and commercial areas. Major sources include restrooms, kitchens, and ablution areas associated with the residential and communal facilities.

To ensure proper treatment and safe disposal, a centralized wastewater management system will be developed within the housing scheme. The system will comprise septic tanks with soakage pits designed to treat and dispose of domestic wastewater at the source before safe percolation into the soil.

Each residential block (A, B, C, and D) will be equipped with underground septic tanks constructed with reinforced cement concrete (RCC) walls and supporting columns to ensure structural stability and leak prevention. The septic tanks will allow sedimentation and anaerobic digestion, effectively reducing organic load.

Treated effluent from the septic tanks will be discharged into soakage pits, which are porous, covered chambers designed to promote infiltration of partially treated water into the ground,

preventing surface runoff and contamination. Regular desludging and maintenance schedules will be implemented to sustain system performance and comply with **Punjab Environmental Quality Standards (PEQS)** for municipal wastewater disposal.

This decentralized system ensures that wastewater from all sectors of Shaheen Orchard Housing Scheme is managed efficiently, minimizing risks to soil, groundwater, and public health.

2.11.4 Underground Water Tanks

The master plan of Shaheen Orchard Housing Scheme includes strategically located underground water tanks to ensure a reliable and continuous water supply for residents and commercial users. These tanks are designed to store water for both **domestic consumption** and **firefighting purposes**, connected through the scheme's internal distribution network. Each block has access to the central water storage and pumping system, supported by tube wells to maintain pressure and supply during peak demand. The underground tanks also play a vital role in maintaining adequate reserves for emergencies and promoting efficient water management within the housing scheme.

In the **proposed 230-Kanal extension area**, the water supply network will be **linked with the existing underground storage tanks** of the approved 671 Kanals phase to ensure consistent supply and operational integration. Additional underground tanks may be installed where required to support new residential and commercial plots, ensuring equal water availability throughout the scheme. This integration will strengthen the scheme's overall water infrastructure and provide sustainability and resilience against water shortages.

2.11.5 Components of Solid Waste Management Plan:

The solid waste management system consists of six main components that ensure the effective handling of waste from its origin to final disposal. The process begins with waste generation, where waste is produced from residential, commercial, and construction activities. The next step is classification at the source, where waste is segregated into categories such as organic, recyclable, hazardous, and general waste to facilitate proper management. This is followed by storage, where waste is temporarily kept in color-coded bins or containers in a safe and hygienic manner. After storage, sorting and processing take place to separate useful materials for recycling or reuse. The next stage is collection, transport, and transfer, during which the waste is gathered and transported through authorized vehicles to designated facilities. Finally, separation, processing, and recycling are carried out before the final disposal, where non-

recyclable waste is safely disposed of in sanitary landfills or through other environmentally sound methods

2.11.6 Solid Waste Generation Estimates:

Based on the estimated waste generation rate of 0.65 kg per capita per day, the total solid waste generated in the Shaheen Orchards Housing Scheme is approximately 6.67 tons per day. The calculation is based on an estimated population of 8,554 persons, derived from 1,222 residential units with an average household size of seven persons. The total waste includes municipal waste (5.56 tons/day), green waste (0.55 tons/day), and commercial waste (0.55 tons/day).

According to ASTM standards, a 0.5 m^3 storage container can hold around 105 kg of waste, and therefore approximately 11 storage containers are required to accommodate the daily generated commercial and green waste within the scheme. These containers will be strategically placed outside commercial buildings and parks for efficient waste collection and transportation. This estimation provides a foundation for planning an effective solid waste management system, ensuring compliance with environmental standards and maintaining cleanliness across the housing scheme

Table represents the estimation of waste generation

Description	Values
Designed Number of Houses in Scheme	1,222 houses

Estimated Population of Designed Scheme (@ 7 persons per house)	8,554 persons
Estimated Waste Generation Rate	0.65 kg/capita/day
Estimated Municipal Solid Waste Generation of Scheme (8554 × 0.65 / 1000)	5.56 tons/day
Estimated Green Waste Generation (10% of total waste)	0.55 tons/day
Estimated Commercial Waste Generation (10% of total waste)	0.55 tons/day
Total Solid Waste Generation of Scheme (D = A + B + C)	**6.67 tons/day**
One Storage Container Capacity	0.5 m^3 / 105 kg
Storage Container Requirement (for Commercial & Green Waste)	1100 / 105 = 10.47 ≈ **11 Containers**

2.11.6 Solid Waste Management Plan

The solid waste management system for the society is designed to ensure safe, hygienic, and environmentally responsible handling, storage, transportation, and disposal of all waste generated during both the construction and operational phases. The plan emphasizes waste minimization, segregation at source, and adherence to local EPA and municipal regulations.

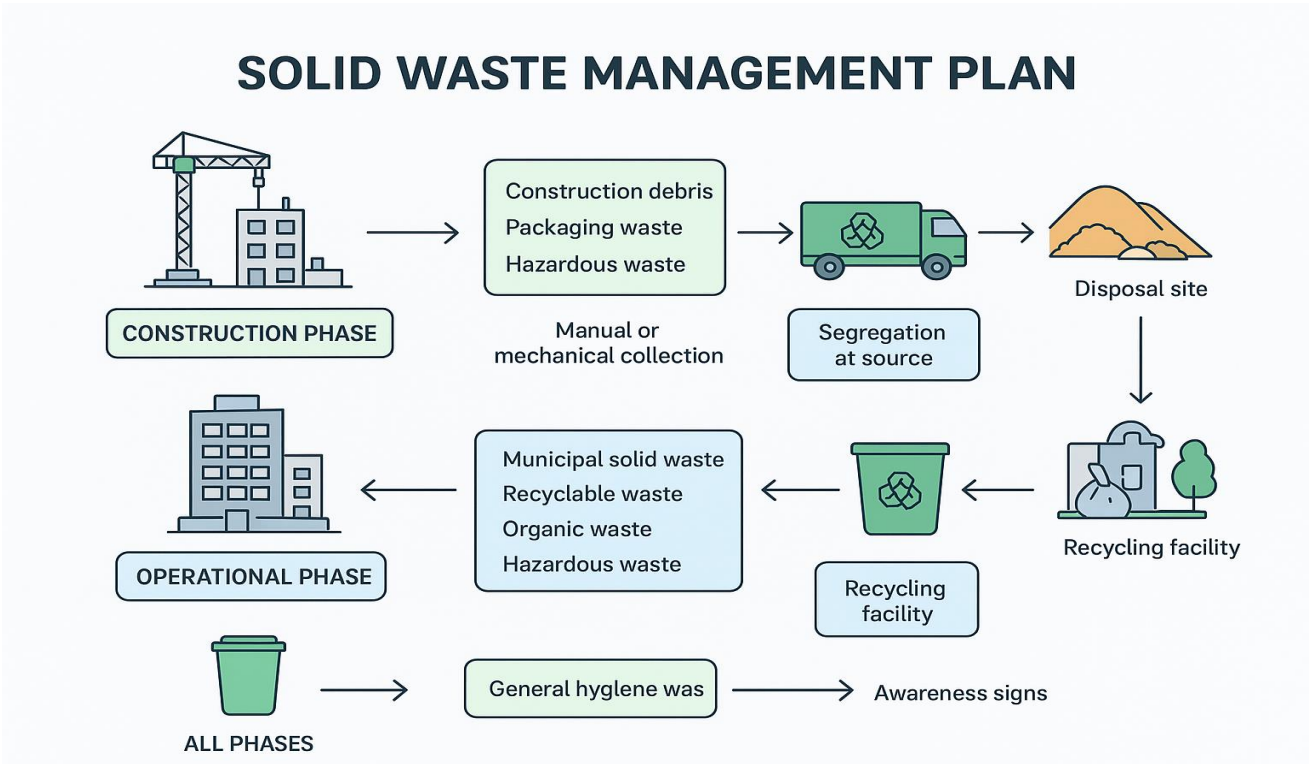
Table 2.4: Solid Waste Management Plan of Construction and Operation Phase

Phase	Waste Type	Source	Management Strategy	Responsible Party
Construction	Construction debris (bricks, concrete, tiles, metal scraps)	Civil and structural works	Collected daily; reusable materials (e.g., concrete, bricks) will be reused in leveling or backfilling; remaining debris will be transported to an	Site Supervisor

			approved municipal dumping site	
	Packaging waste (plastic, cardboard, wooden pallets)	Material delivery and handling	Segregated at source; recyclable materials sent to recycling vendors; biodegradable packaging disposed of properly	HSE Officer
	Hazardous waste (paints, oils, lubricants, chemicals)	Finishing and equipment maintenance	Stored in labeled leak-proof containers; handled with PPE; disposed of through licensed hazardous waste handlers	HSE Officer
	Food waste and domestic refuse	Labor camps and site offices	Collected daily in covered bins; disposed of through municipal collection system	Contractor
Operational	Municipal solid waste	Offices, shops, residential units, and common areas	Segregated into color-coded bins (organic, recyclable, non-recyclable); daily collection and disposal through authorized waste management contractor	Janitorial Team / Facility Manager
	Recyclable waste (paper, glass, plastic, metal cans)	Offices, canteens, shops	Collected separately and sent weekly to recycling centers	Janitorial Team

	Organic waste (food and green waste)	Canteens, landscaping areas	Composting within designated site area or handed over to municipal composting facility	Maintenance Team
	Hazardous waste (batteries, e-waste, cleaning agents)	Maintenance and housekeeping	Stored securely in marked containers; periodically handed over to licensed contractors for safe disposal	Maintenance Supervisor
All Phases	General hygiene waste	All zones	Provision of covered bins; regular cleaning schedule; awareness signage displayed to promote cleanliness	All Occupants & Waste Staff

Pictorial representation of Solid waste Management Plan



2.11.6 Water Sanitation Management

The building will be equipped with a well-planned water and sanitation system to ensure hygienic and efficient service delivery. A 5,000-gallon underground water tank will be installed in the basement, serving as the primary storage for domestic water supply, including restrooms, kitchen, and cleaning services. Water will be distributed to all floors through an internal piping network, ensuring consistent flow and quality.

A septic tank located in the basement utility area will manage wastewater from washrooms and kitchen areas, ensuring proper on-site treatment before safe discharge into the municipal sewer system. Additionally, the facility includes an ablution area and sufficient sanitary fittings, designed to meet building code requirements. Regular maintenance and timely waste disposal will be ensured to maintain hygiene and environmental compliance.

2.11.7 Parking and security Management

The proposed extension of Shaheen Orchard Housing Scheme includes well-planned parking and security arrangements to ensure safety, accessibility, and convenience for residents and visitors. Designated parking areas will be developed across the residential and commercial zones, with separate allocations for cars and motorcycles. Roads and entry points are designed to accommodate smooth traffic flow, minimize congestion, and allow easy access for emergency and service vehicles.

A comprehensive security management system will be implemented throughout the extension area, including boundary fencing, security checkpoints, and CCTV surveillance at key locations such as entry gates, commercial areas, and community spaces. Security personnel will be deployed in coordination with the central control system of the already approved phases to maintain round-the-clock vigilance, ensuring a safe and secure living environment for all residents

2.11.8 Power Sources Transmission

The proposed extension will be fully integrated into the existing power supply network of Shaheen Orchard, ensuring consistent and reliable electricity for residential, commercial, and community facilities. The primary power source will be provided through a dedicated WAPDA connection, distributed via underground cables and transformer units installed at designated utility points within the extension area.

To promote sustainable energy use, solar-powered streetlights and renewable energy options are planned for selected community facilities, helping reduce dependence on conventional

power and lower operational costs. Backup power systems, including generators at key utility stations, will ensure uninterrupted supply for critical services such as street lighting, water pumping stations, and security systems.

Electric Supply: The primary source of power will be obtained through a dedicated connection from the Sheikhupura Electric Supply Company meeting the load requirements for lighting, lifts, HVAC systems, office equipment, and other essential facilities. Power will be transmitted from the main connection point to electrical room located in the basement bedside the security room. From there, electricity will be distributed to each floor through sub-distribution panels, with all wiring concealed within conduit systems in compliance with local safety standards.

Solar PanelsTo promote energy efficiency and environmental sustainability, the Shaheen Orchard Housing Scheme (Extension) will incorporate solar energy systems within selected community areas and along main roads. Solar panels will be installed primarily for street lighting, park illumination, and operation of essential public facilities, thereby reducing dependence on grid electricity and lowering the scheme's overall carbon footprint.

Fire Safety and Evacuation Plan

The proposed project incorporates a comprehensive Fire Safety and Evacuation Plan to ensure the protection of life, property, and the environment during both construction and operational phases. Fire safety measures are designed in accordance with National Fire Protection Association (NFPA) standards and local building by-laws.

Key components of the plan include the installation of fire detection and alarm systems, fire extinguishers, and hydrant points at strategic locations throughout the premises. Fire extinguishers of appropriate types (CO_2, dry chemical, and foam) will be placed in corridors, utility rooms, and near electrical panels, while automatic smoke detectors and alarms will be installed in offices, shops, and common areas to provide early warning.

All electrical installations will comply with fire safety standards, using flame-retardant materials and proper insulation to prevent short circuits. During the operational phase, an emergency exit system will be maintained with clearly marked escape routes and illuminated exit signs. Emergency lighting will remain operational during power failures to guide occupants toward assembly points.

A fire control room (or designated safety station) will monitor alarms and coordinate response in case of an emergency. Staff and maintenance personnel will receive training on the use of fire extinguishers, first aid, and evacuation procedures. Regular fire drills will be conducted to familiarize all occupants with safe exit routes and ensure the efficiency of emergency responses.

Additionally, the plan includes the establishment of assembly points at safe distances from buildings where occupants can gather during evacuation. Firefighting equipment will be regularly inspected and maintained by certified personnel to ensure functionality. Coordination with the local fire department will be maintained for quick emergency response and compliance with fire codes.

2.11.9 Health, Safety and Environment

Health, safety, and environmental protection are integral components of the Shaheen Orchard Housing Scheme Extension (230 Kanals) during all project phases including planning, construction, and long-term operation. The project management has adopted a comprehensive Health, Safety, and Environmental (HSE) Policy, ensuring a safe working environment for workers, contractors, and visitors, while minimizing environmental impacts.

The policy emphasizes proactive risk management, compliance with national environmental and occupational safety standards, and promotion of a safety-first culture at the project site. The HSE framework focuses on the following key commitments:

Identify, assess, and mitigate potential HSE hazards associated with construction and operation activities.

Ensure transparent communication and reporting of all incidents, along with the implementation of preventive and corrective measures.

Educate and train all employees, contractors, and visitors regarding HSE protocols and the “Zero Injury and Safe Work” approach.

Develop and promote environmentally responsible practices, including reduction in air emissions, control of dust, responsible water use, energy conservation, and proper waste management.

Maintain qualified and well-trained staff, ensuring competent supervision and safe performance of all site activities.

Encourage active participation and accountability of all team members in maintaining health and safety standards.

Engage and raise awareness among external stakeholders, including local communities and regulatory bodies, regarding environmental sustainability and safety initiatives.

Continuously improve HSE performance through regular audits, monitoring, and review of procedures and compliance with relevant laws and guidelines.

Through the implementation of these measures, the Shaheen Orchard Housing Scheme aims to maintain a safe, sustainable, and environmentally responsible community development, in line with national standards and the project's long-term sustainability objectives.

2.12 Restoration and Rehabilitation Plans

Upon completion of the construction, the proponent plans to carry out site-level rehabilitation that includes the clearing of construction debris, safe disposal of solid and hazardous waste, and site grading to restore uniform levels.

Limited landscaping features, such as ornamental plants or boundary greening, may be introduced to enhance visual aesthetics and reduce dust dispersion. Footpaths, paved areas, and stormwater management systems will be developed to ensure that the finished facility is safe, functional, and environmentally compatible.

CHAPTER-3: DESCRIPTION OF ENVIRONMENT

3.1 Baseline Physical Environment

The baseline physical environment assessment provides an overview of the existing conditions of the project site and its surroundings. This section includes details on topography, climate, air quality, water resources, soil characteristics, and noise levels to establish a reference point for evaluating potential environmental impacts.

3.1.1 Topography and Land Use

The project site is located in Sheikhupura, a city characterized by flat terrain with a gentle slope towards the south and southeast. The land primarily consists of urban and semi-urban areas with mixed land use, including industrial, commercial, and residential zones. The site is accessible through a well-developed road network, facilitating transportation and logistics for industrial activities.

3.1.2 Climate and Meteorology

Sheikhupura experiences a subtropical climate with distinct seasonal variations. The meteorological conditions for the region are summarized below:

Table 3.1: Climate Characteristics of Sheikhupura

Parameter	Description
Temperature Range	5°C to 47°C (Seasonal variations)
Annual Rainfall	600–700 mm
Humidity	30% – 85% (varies seasonally)
Prevailing Wind Direction	Northwest and Southwest
Monsoon Period	July – September

3.1.3 Air Quality

Sheikhupura faces air quality challenges due to vehicular emissions, industrial activities, and construction dust. Baseline air quality monitoring in the project area is summarized below:

Table 3.2: Baseline Air Quality Parameters

Pollutant	Measured Concentration (µg/m³)	NEQS Limit (µg/m³)	WHO Guideline (µg/m³)
PM10	160–220	150	50
PM2.5	90–140	35	15
SO_2	45–65	120	20
NO_x	50–80	80	40
CO	3–5 mg/m³	5 mg/m³	4 mg/m³

Concentrations exceeding WHO guidelines indicate potential health concerns, especially during winter months when smog conditions intensify.

3.1.4 Water Resources

The primary water source for Sheikhupura is groundwater, extracted through tubewells. The water quality in the project area is analysed as follows:

Table 3.3: Groundwater Quality Analysis

Parameter	Measured Value	NEQS Limit
pH	7.2 – 7.8	6.5 – 8.5
TDS (mg/L)	450 – 700	1000
Nitrates (mg/L)	12 – 25	50

3.1.5 Soil Characteristics

The soil in Sheikhupura consists of alluvial deposits with sandy loam and clayey textures.

Table 3.4: Soil Characteristics of Project Site

Parameter	Value
Texture	Sandy Loam, Clayey
Permeability	Moderate to High
pH	7.1 – 7.5
Organic Matter (%)	0.5 – 1.5%
Soil Contamination	Possible due to industrial runoff

3.1.6 Noise Levels

Noise levels in the vicinity are influenced by traffic, industrial operations, and commercial activities. Baseline noise monitoring results are presented below:

Table 3.5: Noise Levels in Project Area

Location	Daytime Noise Level (dB)	Nighttime Noise Level (dB)	NEQS Limit (dB)
Project Site	68 – 72	54 – 58	70 (Day), 55 (Night)
Adjacent Commercial Zone	65 – 70	50 – 55	65 (Day), 55 (Night)
Nearby Residential Area	60 – 65	48 – 52	55 (Day), 45 (Night)

The baseline physical environment assessment highlights key factors that may influence the environmental impact of project operations. Proper mitigation measures will be required to minimize adverse effects on air quality, water resources, and noise levels in compliance with EPA Punjab regulations.

3.2 Baseline Ecological Environment

The baseline ecological environment assessment identifies and evaluates the existing flora, fauna, and biodiversity within and around the project site. This information provides a reference for understanding potential impacts on the local ecosystem due to project activities.

3.2.1 Terrestrial Ecology

Sheikhupura has an urbanized environment with fragmented green spaces, parks, and agricultural lands. The project site is located in an area dominated by industrial and commercial activities, with limited natural vegetation. However, some pockets of greenery exist in the form of roadside plantations and small green belts.

Table 3.6: Common Terrestrial Flora in the Project Area

Botanical Name	Common Name	Status (Native/Planted)	Ecological Importance
Dalbergia sissoo	Sheesham	Native	Timber, Shade
Azadirachta indica	Neem	Planted	Air Purifier, Medicinal
Melia azedarach	Dharek	Native	Ornamental, Pollution Control
Eucalyptus spp.	Safeda	Planted	Fast Growth, Shade
Ficus religiosa	Peepal	Native	Sacred, Oxygen Provider

3.2.2 Faunal Diversity

The faunal diversity in the project area is influenced by urbanization. The presence of wildlife is limited to common urban species, including birds, rodents, and small mammals.

Table 3.7: Common Fauna Observed in the Project Vicinity

Scientific Name	Common Name	Conservation Status (IUCN)	Habitat
Passer domesticus	House Sparrow	Least Concern (LC)	Residential and commercial buildings, trees
Corvus splendens	House Crow	Least Concern (LC)	Urban rooftops, markets, waste areas
Milvus migrans	Black Kite	Least Concern (LC)	Open skies, near waste and meat shops
Columba livia domestica	Rock Pigeon	Least Concern (LC)	Building ledges, balconies, rooftops

3.2.3 Aquatic Ecology

The nearest significant water body is the **Ravi River**, located approximately **10-12 km northwest** of the project site. However, due to severe pollution from untreated wastewater and industrial discharge, the aquatic ecosystem in the Ravi River has been significantly degraded.

Table 3.8: Summary of Aquatic Ecological Conditions in Ravi River

Parameter	Status
Water Quality	Highly Polluted (High TDS, Heavy Metals)
Aquatic Life	Low Biodiversity, Presence of Catfish & Carp
Flora	Algae & Water Hyacinth (Indicators of Pollution)
Human Interaction	Fishing, Sand Mining, Domestic Waste Disposal

3.2.4 Protected Areas and Sensitive Habitats

The project site does not fall within any protected areas, national parks, or wildlife sanctuaries. However, Sheikhupura hosts several parks and green spaces that serve as biodiversity pockets.

Table 3.9: Major Green Spaces Near the Project Site

Name of Green Area	Approximate Distance from Site	Ecological Importance
Sheikhupura Main Park	~1 km	Urban green space, public recreation, tree cover
Liberty Market Green Belt	~1.2 km	Aesthetic enhancement, pollution buffer
Jilani Park (Racecourse Park)	~5 km	Urban biodiversity, floral displays, public events
Bagh-e-Jinnah	~6 km	Large urban park, supports tree canopy and bird life
Model Town Park	~7 km	Jogging tracks, water features, and recreational space

Distances are approximate and calculated based on the location of project site at Zahoor Ellahi Road, Sheikhupura.

The project area has limited natural ecological value due to urbanization, with biodiversity primarily consisting of common terrestrial and avian species. The Ravi River's aquatic ecosystem is highly degraded due to pollution. Since no protected or endangered species were recorded in the vicinity, the project's ecological impact is expected to be minimal. However, greenbelt development and proper waste management will be necessary to maintain environmental balance.

3.3 Baseline Socioeconomic Environment

The baseline socioeconomic environment assessment provides an overview of the demographic, economic, and social conditions of the area surrounding the project site. This analysis helps in understanding the potential impact of the project on local communities, infrastructure, and services.

3.3.1 Demographic Profile

The project is located at Sheikhupura, **Sheikhupura**, an area with a mix of rural and semi-urban settlements. The area is well-developed, with modern infrastructure, shopping malls, restaurants, and corporate offices, attracting both locals and tourists.

Table 3.10: Demographic Profile of the Project Area

Parameter	Details
Total Population (Approx.)	Over 300,000 (within a 5–7 km radius)
Major Settlements Nearby	Liberty Market, MM Alam Road, Ghalib Market, Main Boulevard Sheikhupura
Household Size	4–6 persons per household (urban average)
Literacy Rate	~75% (Higher due to urban setting and access to quality education)
Primary Occupations	Business, retail, corporate services, private/public sector employment

3.3.2 Economic Activities

The local economy of Sheikhupura is largely influenced by industrial and agricultural activities. Key economic sectors include:

- **Industrial Sector:** The region hosts beverage, textile, and small manufacturing industries, providing employment to the local workforce.
- **Agriculture:** Surrounding areas have farms producing wheat, sugarcane, and vegetables.
- **Trade & Services:** Local markets, retail businesses, and service-based employment are prevalent.

3.3.3 Infrastructure & Public Services

The region has access to modern infrastructure without any challenges.

Transportation & Roads:

- Public transport options include speedo-buses, electro-bus, rickshaws, and mostly private vehicles.
- Road conditions are well-developed and well-maintained, reflecting its status as a major commercial and upscale residential area.

Healthcare Facilities:

- Several private and public healthcare facilities are located in close proximity to the project site, ensuring easy access to medical services for residents and workers.
- The nearest major hospital is Sundas Hospital, Sheikhupura, located approximately 1.5 km from the project area.

Education Facilities:

- Modern schools provide quality education.
- Nearby areas have top-rank schools, colleges and universities

Table 3.11: Key Infrastructure Facilities Near the Project Site

Facility Type	Availability in Vicinity
Road Connectivity	Located along Main Lahore–Sheikhupura Road with easy access to nearby highways
Public Transport	Easily available, including local vans, rickshaws, and buses
Healthcare Centres	Several public and private medical facilities, including Sundas Hospital (~1.5 km away)
Educational Institutions	Schools, colleges, and training institutes located within nearby residential sectors
Water & Electricity	Available through municipal supply and LESCO grid connection

3.3.4 Social & Cultural Aspects

- The local community follows traditional and religious values, with mosques and cultural centres playing a significant role in daily life.
- Community engagement is strong, with people participating in local events and business activities.
- No major historical or cultural sites are located directly within the project area, but Sheikhupura city has significant heritage sites.

3.3.5 Environmental Concerns of Local Communities

During initial stakeholder consultations, the following concerns were identified:

- **Water Availability:** Concerns about groundwater depletion due to industrial water usage.
- **Employment Opportunities:** Expectation that the project will create jobs for the local workforce.
- **Traffic & Safety:** Increased traffic on Main Sheukhupura Road may impact road safety.
- **Air & Noise Pollution:** Industrial emissions and traffic may contribute to environmental pollution.

The project area has a growing industrial and agricultural economy with basic infrastructure. While the project is expected to create job opportunities, mitigation measures will be needed to address concerns related to water usage, traffic, and environmental pollution.

3.4 Laboratory Reports of Environmental Analyses

The environmental analysis for air, water, noise, and soil was conducted to assess baseline conditions near the project site. The tests were performed in accordance with **Punjab Environmental Quality Standards (PEQS)** and international best practices.

3.4.1 Air Quality Analysis

Air quality monitoring was conducted at multiple locations around the project site. The results indicated that while most parameters were within permissible limits, **$PM_{2.5}$ levels were slightly elevated**, likely due to **vehicular emissions mainly** and dust at certain construction sites. The presence of **Sulphur Dioxide (SO_2) and Nitrogen Dioxide (NO_2) was minimal**, suggesting limited industrial pollution in the immediate vicinity.

Key Findings:

- $PM_{2.5}$ levels exceed the recommended limit, requiring dust suppression measures.
- Other air pollutants remain within acceptable limits.
- Seasonal variations and weather conditions (e.g., winter smog) may influence air quality.

3.4.2 Water Quality Analysis

Water samples were collected from nearby groundwater sources to assess suitability for drinking and industrial use. The results showed that pH, turbidity, total dissolved solids (TDS), and heavy metal concentrations were within PEQS limits. No significant contamination of lead or iron was detected, and nitrate levels remained within safe limits, indicating no immediate risk from agricultural runoff or industrial waste.

Key Findings:

- Water is safe for industrial and drinking purposes.
- No significant contamination from heavy metals or pollutants.
- Regular monitoring is recommended to ensure long-term sustainability.

3.4.3 Noise Level Monitoring

Noise levels were recorded at the project site, nearby residential areas, and along Sheikhupura Road. While noise remained within acceptable limits during night time, slightly higher levels were recorded in zones during daytime, mainly due to traffic movement.

Key Findings:

- Night time noise levels are within PEQS limits.
- Slight exceedance in this area day time.
- Use of green buffers or noise barriers is recommended.

3.4.4 Soil Quality Analysis

Soil samples were collected to analyse fertility, texture, and contamination levels. The results indicated that pH levels were neutral to slightly alkaline, and organic matter content was sufficient for vegetation growth. No heavy metal contamination was detected, making the soil suitable for development.

Key Findings:

- Soil is suitable for commercial construction.
- No heavy metal contamination was detected.
- Organic matter content supports potential landscaping.

3.5 Suitability of the Project Site

The proposed project site, located at **Sheikhupura** has been evaluated based on environmental, socioeconomic, and infrastructural factors. The assessment confirms that the site is generally suitable for the development of a commercial facility, with some minor considerations for environmental management.

3.5.1 Location & Accessibility

- The site is situated along Zahoor Ellahi Road, a major national highway that provides easy transportation access for raw materials and finished products.
- The location is well-connected to Main Boulevard Sheikhupura, shopping malls, urban residential areas, restaurants, major parks, hospitals, top educational institutions and other modern facilities.

3.5.2 Environmental Considerations

- **Air Quality:** Baseline studies indicate that air pollutants are mostly within limits, except for slightly elevated $PM_{2.5}$ levels due to regional vehicular emissions and dust.
- **Water Availability:** Groundwater testing confirms that water quality is within PEQS limits, ensuring a reliable source for industrial operations. However, sustainable water management is required to prevent over-extraction.
- **Noise Impact:** Noise levels are within acceptable limits during night but slightly exceed limits in commercial areas at day. Mitigation measures such as noise barriers are recommended.

3.5.3 Land Use & Soil Suitability

- The area is designated for commercial use, aligning with zoning regulations.
- Soil analysis indicates no heavy metal contamination, making it suitable for industrial construction.
- Stable topography minimizes risks of land subsidence or erosion.

3.5.4 Socioeconomic Considerations

- The local economy is educated in this area, providing potential employment opportunities for nearby communities.
- The presence of commercial zones in the vicinity reduces potential conflicts with residential areas.
- The project is expected to generate economic benefits, including job creation and increased demand for business services.

CHAPTER-4: SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION

The purpose of this chapter is to systematically identify, evaluate, and propose management strategies for the potential environmental impacts associated with the construction and operation of the proposed five-story commercial building located within Shaheen Orchards Housing Scheme, Sheikhupura. The assessment focuses on potential impacts during both the construction and operational phases, emphasizing effective mitigation, control, and sustainability enhancement measures.

4.1 Project Location

he proposed commercial building is located in Mouza Bado Muraday Khurd, along Sharaqpur Road, Tehsil and District Sheikhupura, Punjab, Pakistan. The site falls within a rapidly developing urban-commercial corridor of Sheikhupura, featuring a mix of residential, commercial, and institutional developments.

The location offers direct access from Sharaqpur Road, which serves as one of the major arterial routes connecting Sheikhupura with Lahore and surrounding industrial and residential areas. The project area is well-supported by existing infrastructure, including road connectivity, electricity supply, water availability, and nearby community facilities.

This strategic location makes the project highly suitable for commercial development, ensuring both accessibility and visibility to the local and regional population.

4.2 Impact Analysis and Prediction

The impact analysis focuses on identifying likely adverse and beneficial environmental impacts based on the project's location, design, scale, and activities. Impacts have been predicted using checklists, expert judgment, and comparison with similar urban commercial projects.

4.3 Impact Assessment Criteria

The assessment of potential environmental impacts requires a systematic and objective framework to evaluate how various project activities may affect the environment. The purpose of using standardized impact assessment criteria is to determine the nature, scale, and significance of potential impacts, which in turn guides the selection of appropriate mitigation and management measures. For this project, the following criteria have been used to assess

each potential environmental impact during both the construction and operational phases:

Table 4.1: Impact Assessment Citeria

Criteria	Description
Nature	Positive or negative
Duration	Short-term (during construction) or long-term (operational phase)
Magnitude	Low, moderate, or high based on severity
Extent	Site-specific, local, or regional
Reversibility	Reversible (e.g., dust) or irreversible (e.g., land use change)
Mitigation	Impact can be reduced, controlled, or eliminated

4.3.1 Analysis of Impacts and Proposed Mitigation Measures

This section presents an assessment of the potential environmental impacts likely to occur during the construction and operational phases of the proposed commercial building at Shaheen Orchards (Extension), Mouza Bado Muradey Khurd, along Sharaqpur Road, District Sheikhupura, along with the proposed mitigation measures. The analysis aims to minimize negative effects while ensuring environmental compliance and sustainability in line with the Pakistan Environmental Protection Act (PEPA), 1997 and the EIA/EIA Regulations, 2000:

Constructional Phase

During the construction phase, the site will undergo physical activities such as excavation, foundation laying, structural works, and material handling. These activities can result in **short-term, localized environmental impacts** that can be effectively managed through proper mitigation.:

Table 4.2: Construction Phase Impacts and Mitigation Measures

Environmental Aspect	Potential Impact	Proposed Mitigation Measures
Air Quality	Dust generation from excavation, material transport, and onsite vehicle movement	Regular water sprinkling, covering of stockpiles, use of dust nets around construction perimeter, proper vehicle maintenance
Noise & Vibration	Noise from machinery and construction equipment disturbing nearby residents	Use of noise-controlled machinery, restrict high-noise operations to daytime, provide PPE (ear protection) to workers
Solid Waste	Generation of debris, packaging, and construction waste	Segregate waste at source, reuse recyclable material (steel, concrete), dispose remaining waste at approved disposal sites of Tehsil Municipal Administration (TMA) Sheikhupura
Soil & Water Pollution	Contamination from spillage of oils, fuels, and concrete waste	Provide designated fueling area with spill trays, avoid mixing concrete near drains, ensure proper storage and disposal of hazardous materials
Health & Safety	Occupational risks, heat stress, dust inhalation	Use of PPE (helmets, masks, gloves), safety training for workers, first aid facility at site, and display of safety signboards
Traffic and Accessibility	Increased vehicle movement causing congestion or safety risks	Schedule material deliveries during off-peak hours, provide temporary traffic signage, ensure on-site vehicle management

These mitigation strategies are proactive and cost-effective, ensuring that environmental quality is preserved and regulatory compliance is maintained during the construction period.

Operational Phase

After completion, the building will function as a commercial facility, generating routine environmental impacts associated with daily business operations such as energy consumption, waste generation, and water usage. The impacts are **manageable and mitigable through sustainable building practices** integrated into the project design.

Table 4.3: Operational Phase Impacts and Mitigation Measures

Environmental Aspect	Potential Impact	Proposed Mitigation Measures
Solid Waste	Daily waste from offices, cafeterias, and shops	Provision of dedicated garbage room in basement, segregation at source, regular collection by TMA or approved contractor
Water Use	Increased water demand for occupants	Installation of low-flow fixtures, underground **domestic water storage tank (5,000 gallons)**, periodic leak inspections
Wastewater	Generation of greywater and sewage	**Full-length septic tank** installed in basement with soakage pit; regular desludging and maintenance; connection to municipal sewer system (if available)
Energy Use	Electricity consumption and reliance on grid power	Integration of **rooftop solar panels** for partial power generation, LED lighting, motion sensors, and energy-efficient HVAC system
Fire Safety	Risk of fire incidents	Installation of **fire detection and suppression system**, **15,000-gallon firefighting water tank**, alarms, and extinguishers on each floor

Noise	Sound from generators and HVAC units	Use of **soundproof enclosures** for DG sets, regular maintenance, and noise monitoring during operation
Heat Island Effect	Absorption of heat by concrete surfaces	Incorporation of **rooftop garden** and **reflective surface materials** to lower heat absorption and improve air quality
Traffic Management	Increased vehicular movement within premises	Designated entry/exit points, organized parking in basement and ground floor, deployment of security and traffic personnel

.

4.5 Purpose of Mitigation

Mitigation measures are an essential component of any environmentally responsible development project. The purpose is to comply with legal requirements as they are intended to prevent, reduce, control, or offset potential negative environmental impacts that may arise during both the construction and operational phases of the project. In the context of this commercial building development, mitigation serves several important environmental, regulatory, social, and operational goals.

4.5.1 Environmental Protection

The primary objective is to safeguard air, water, soil, and the surrounding ecosystem from any degradation arising from construction or operational activities within the project premises. Measures such as dust suppression, controlled wastewater disposal, and responsible solid waste management will be implemented. Additional environmental features, including rainwater harvesting systems, green belts, and a rooftop garden, will serve as proactive safeguards promoting long-term ecological balance and sustainability within the Shaheen Orchards development.

4.5.2 Compliance with Legal and Regulatory Requirements

In accordance with the Pakistan Environmental Protection Act (PEPA) 1997 and EIA/EIA Regulations 2000, the project will implement all necessary environmental safeguards to prevent adverse impacts and ensure full compliance with applicable laws. Construction and operational activities will also adhere to the Punjab Environmental Quality Standards (PEQS)

and building safety regulations. Compliance will ensure the project proceeds without legal or regulatory delays while maintaining environmental integrity.

4.5.3 Protection of Public Health and Safety

Strict safety and health measures will be implemented during both construction and operational phases to prevent accidents, pollution, or health-related risks. These include dust control, noise mitigation, proper handling of solid and liquid waste, and installation of firefighting infrastructure, such as dedicated fire water tanks, alarms, and extinguishers. Security surveillance and emergency response systems will also be in place to protect occupants, visitors, and assets within the premises..

4.5.4 Promotion of Sustainable Development

The project emphasizes sustainability by integrating solar panels, energy-efficient lighting, green building concepts, and optimized water management systems. These initiatives align with the environmental vision of Shaheen Orchards Housing Scheme, contributing to resource efficiency, reduced greenhouse gas emissions, and enhanced urban livability. Through these measures, the development supports long-term environmental stewardship and sustainable urban growth.

CHAPTER-5: ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

5.1 Purpose and Objectives of EMP

The Environmental Management and Monitoring Program (EMP) is a crucial component of the EIA process. Its primary purpose is to ensure that all environmental impacts identified during the assessment are properly managed, mitigated, or eliminated through structured and systematic implementation of mitigation measures.

This EMP has been developed to guide the project proponent, contractors, engineers, and operational staff in meeting environmental compliance throughout the construction and operational phases of the commercial building. It provides a clear framework for monitoring, reporting, and improving environmental performance in line with the Pakistan Environmental Protection Act, 1997, and applicable Punjab EPA guidelines.

Objectives of EMP

The main objectives of the EMP include**:**

- To implement all mitigation measures identified in the EIA report in a timely and effective manner.
- To monitor the environmental performance of the project during construction and operation.
- To assign roles and responsibilities for environmental compliance among project personnel.
- To provide early detection of environmental issues and initiate corrective actions.
- To ensure compliance with National Environmental Quality Standards (NEQS) and other legal requirements.
- To build environmental awareness and capacity among construction workers, facility managers, and maintenance staff.

5.2 Institutional Responsibility

Table 5.1: Institutional Responsibility of the Project

Institution	Responsibility
Project Proponent	Ensure EMP implementation and financial resources
Contractor	Day-to-day execution of mitigation and safety measures
Environmental Consultant	EMP preparation, monitoring, reporting to EPA, training
EPA Punjab	Oversight, review of compliance, approvals, and site inspections
Building Management	Waste disposal, rooftop garden, security management, water tank maintenance

5.3 Training Schedule

Table 5.2: Training Schedule of the Project

Training Subject	Target Audience	Frequency
Environmental Best Practices	Workers, Contractors	Monthly
Emergency Response	All Staff	Bi-annually
Fire Safety and Evacuation	Security & Tenants	Bi-annually
Waste Handling & Segregation	Cleaning Crew	Quarterly

5.4 Responsibility of EMP

Primary accountability lies with the Project Proponent, who will oversee budget allocation, contractor compliance, and reporting. The Environmental Consultant will act as the EMP coordinator, facilitating monitoring, inspections, and corrective actions in collaboration with the contractor's HSE officer.

5.5 Environmental Technical Assistance and Training Plan

To support implementation:

- Third-party labs will be engaged for air, water, and soil analysis
- Certified trainers will be hired for fire safety and emergency response
- Environmental audit reports will guide future training modules

5.6 Equipment Maintenance Detail

Table 5.3: Equipment Maintenance Details

Equipment	Maintenance Frequency	Maintenance Activity
Diesel Generator	Monthly	Check oil leaks, muffler soundproofing
Water Supply Pump	Bi-monthly	Clean filters, check connections
Fire Extinguishers	Quarterly	Check pressure, nozzle functionality
Construction Equipment	Monthly	Greasing, air filter cleaning

5.7 Monitoring of Quality

Key environmental parameters will be measured during both construction and operational phases to ensure compliance with environmental standards. Quality monitoring involves tracking air, noise, solid waste, and wastewater parameters. Internal audits and third-party lab testing will be used where needed. The Environmental Monitoring Cell (EMC) will document findings, identify trends, and recommend corrective actions.

5.8 Monitoring Plan

Table 5.4: Monitoring Plan of the Project

Parameter	Methodology	Frequency	Responsible Entity
Ambient Air Quality	Dust meters, visual inspection	Quarterly	Environmental Consultant
Noise Levels	Digital sound level meter	Quarterly	HSE Officer
Solid Waste Handling	Waste segregation checklist	Weekly	Waste Supervisor
Septic Tank Performance	Visual inspection Pump-out logs	Bi-annually	Maintenance Contractor
Rainwater Harvesting System	Tank level check, inlet/outlet flow test	Monthly	Plumbing Contractor

Fire Water Tank & Pumps	Functional testing, valve checks	Monthly	Safety & Maintenance Team
Rooftop Solar Panels	Output reading, panel inspection	Monthly	Electrical Maintenance Team
Rooftop Garden & Green Areas	Visual, soil moisture check	Monthly	Gardening Contractor
Water Quality (UGWT)	Laboratory sampling (TDS, pH)	Bi-annually	Environmental Lab or Consultant

5.9 Environmental Management Plan (EMP)

A. Constructional Phase

Table 5.5: Environmental Management Plan of the Project

Environmental Aspect	Potential Impacts	Mitigation Measures	Mitigation Activity	Frequency	Responsibility
Site clearing and excavation	Dust generation, noise, and temporary disturbance to surrounding plots/residences	Sprinkle water to control dust; restrict excavation to daytime hours; erect temporary dust screens/fencing around site	Water sprinkling, installation of dust barriers, proper scheduling of excavation	Daily during excavation	**Site Engineer**
Construction waste management	Improper disposal leading to visual pollution or soil contamination	Segregate waste (recyclable/non-recyclable); dispose at approved LWMC site; avoid on-site burning	3-bin waste collection system; coordinate with LWMC or housing society waste service	Weekly	**Contractor**
Material and equipment storage	Accidental spillage, soil contamination, and obstruction of pathways	Store materials on impervious sheets; cover loose material; ensure designated and labeled storage zones	Use of spill-proof containers, covered storage, regular inspections	Continuous	**HSE Officer**

Machinery and transport operation	Emissions, noise pollution, and traffic hindrance for Shaheen Orchards residents	Maintain vehicles; limit transport during off-peak hours; ensure silencers and emission controls	Machinery maintenance log; implement traffic management plan	Monthly	**Site Manager**
Labor camp and sanitation facilities	Unhygienic conditions, wastewater discharge, and odor nuisance	Provide clean drinking water, temporary toilets, septic tanks; ensure solid waste disposal through LWMC	Install portable toilets, provide waste bins and regular cleaning	Continuous	**HSE Officer**
Rooftop garden preparation and landscaping	Green waste generation (soil, trimmings, debris)	Collect and reuse organic waste; compost where feasible; dispose excess at designated green waste site	Green waste segregation, composting or disposal	As required	**Contractor**
Storage of fuels and lubricants (if any)	Soil and groundwater contamination through spills	Use drip trays, impervious flooring, and labeled containers; prohibit refueling on bare ground	Install spill containment kits and emergency absorbent materials	Continuous	**HSE Officer**

B. Operational Phase

Table 5.5: Environmental Management Plan of the Project

Environmental Aspect	Potential Impacts	Mitigation Measures	Mitigation Activity	Frequency	Responsibility
Site Clearing and Excavation (Extension Area)	Minor dust emissions, noise, and short-term disturbance to surrounding commercial and residential units	Light water sprinkling to control dust; restrict excavation to daytime; use temporary dust nets/fencing	Water sprinkling, dust screens, proper scheduling of excavation work	Daily during excavation	**Site Engineer**
Construction Waste Handling	Debris, packaging material, concrete waste causing visual nuisance or soil contamination	Segregate recyclable and non-recyclable waste; store in designated bins; hand over to LWMC for safe disposal	Use of color-coded bins (3-bin system); coordinate with LWMC/housing authority	Weekly	**Contractor**
Material and Equipment Storage	Accidental spillage, obstruction in common access areas	Store material in confined zones; cover sand/cement; prevent blockage of internal roads	Covered storage areas with labeling and spill prevention measures	Continuous	**HSE Officer**

Operation of Construction Machinery and Vehicles	Air emissions, noise disturbance, temporary traffic obstruction on internal roads	Maintain vehicles regularly; avoid unnecessary idling; restrict heavy transport to non-peak hours	Maintenance log, designated entry/exit for vehicles	Monthly	**Site Manager**
Labor Accommodation and Sanitation	Poor hygiene, wastewater discharge, and odor issues from temporary workforce	Provide clean drinking water, portable toilets, and proper wastewater collection; ensure regular waste removal	Install portable toilets, provide water supply, ensure regular cleaning	Continuous	**HSE Officer**
Rooftop Garden Extension / Landscaping Work	Generation of green waste (soil, trimmings)	Collect and reuse organic waste for on-site landscaping; dispose remaining waste at designated site	Segregation and reuse of green waste	As requ	

This detailed Environmental Management Plan (EMP) provides a structured mechanism to ensure environmental protection throughout both construction and operational phases of the commercial building project. Each aspect is paired with practical mitigation, clear accountability, and consistent monitoring to demonstrate environmental stewardship and compliance with regulatory frameworks.

CHAPTER-6: STAKEHOLDERS AND CONSULTATION

Public and stakeholder consultation is an essential component of the Environmental Impact Assessment (EIA) process. It ensures that the concerns, needs, and suggestions of those potentially affected by the project are identified, considered, and appropriately addressed during the project planning and implementation stages. This participatory approach promotes transparency, builds community trust, and contributes to the long-term sustainability of the project.

6.1 Objectives of Consultation

The main objectives of stakeholder and public consultation in this project are as follows:

- To inform stakeholders and the public about the proposed commercial building project, including its location, scale, purpose, and potential environmental impacts.
- To collect feedback, opinions, and concerns from local residents, businesses, and authorities regarding the project's environmental and social implications.
- To identify and address potential conflicts or concerns early in the planning process to prevent future disputes.
- To promote community participation and ensure that the project aligns with local needs and expectations.
- To integrate suggestions and feasible mitigation measures raised by stakeholders into the project's environmental management plan (EMP).

6.2 Consultative Aspects

The consultation process was designed to be inclusive, transparent, and informative, focusing on the following key aspects:

- **Project Information Sharing:** Clear presentation of project details, including design, land use, environmental features, and expected benefits.
- **Environmental Concerns:** Discussion of possible construction and operational impacts such as noise, traffic, waste generation, and air quality.
- **Safety Measures:** Presentation of proposed fire safety systems, emergency evacuation plans, and wastewater treatment strategies.

- **Community Impact:** Assessment of how the project will influence local traffic flow, parking, green space availability, and surrounding businesses or residences.
- **Feedback Collection:** Open-ended engagement to allow stakeholders to express support, raise objections, or propose modifications to the project plan.

6.3 Identification of Main Stakeholders

The following stakeholder groups were identified as relevant to this project:

- **Local Residents and Property Owners:** Especially those living or owning property adjacent to or near the project site on Zahoor Ellahi Road, Sheikhupura-II.
- **Nearby Businesses and Commercial Establishments:** Shops, offices, and service providers who may be affected during the construction and operational phases.
- **Municipal Authorities:** Including Sheikhupura Development Authority (LDA), Sheikhupura Waste Management Company (SWMC), and the Water and Sanitation Agency (WASA).
- **Environmental Protection Department (Punjab EPA):** As the regulatory authority for EIA approval and compliance monitoring.
- **Construction Contractors and Labor Workforce Representatives:** Who will be involved in the construction and are subject to occupational health and safety protocols.
- **Security and Emergency Services:** For fire safety, disaster response, and building code enforcement.

6.4 Stakeholders Meeting

A stakeholder meeting was held on-site with local residents, landowners, business operators, and representatives from nearby communities to discuss the proposed Shaheen Orchard Housing Scheme and gather feedback regarding its environmental and social aspects. The project team presented key project features, including greenbelt development, plantation of native species, underground sewerage system, solid waste management plan, and provision of essential utilities such as clean water and electricity.

Participants appreciated the initiative for improving local infrastructure, housing availability, and economic opportunities. However, some stakeholders raised concerns related to construction-phase nuisances,

including dust generation, noise, and increased traffic movement. The project team assured that appropriate mitigation and monitoring measures will be implemented as per the Environmental Management Plan (EMP).

Local and municipal representatives expressed support for the project, emphasizing the need for efficient waste collection, maintenance of green areas, and sustainable water use within the housing scheme. All feedback received during the consultation has been documented and incorporated into the EMP to ensure community concerns are effectively addressed throughout the project lifecycle.

6.5 Stakeholder Analysis

6.5.1 Sample Size

During the stakeholder consultation phase, a sample of 15 individuals was engaged, representing local residents, nearby business owners, municipal authorities, and service providers (waste, utilities, and safety). The sample was selected based on proximity to the project site and their level of involvement or potential impact.

6.5.2 Statistical Analysis

Stakeholder responses were compiled and analysed using basic frequency analysis. Feedback was grouped into thematic categories such as environmental concerns, infrastructure expectations, and support for sustainability features. Out of 15 respondents:

Table 6.1: Statistical Analysis of Stakeholders Response

Stakeholder Response	Number of Respondents	Percentage (%)
Supported the housing scheme extension project overall	15	100%
Expressed concerns regarding dust, noise, and traffic during construction	9	60%
Appreciated inclusion of green belts, parks, and plantation features	13	87%
Emphasized proper solid waste and wastewater management within the scheme	11	73%

6.5.3 Results and Discussion

The stakeholder consultation for the Shaheen Orchards Commercial Extension Project was carried out to gather opinions and feedback from nearby residents, shop owners, housing society representatives, and local institutions. A total of 15 individuals participated in the consultation process, ensuring a fair representation of the surrounding community.

Among the participants, 65% were male and 35% were female, indicating an inclusive approach to public participation. In terms of educational background, 50% of respondents held a bachelor's degree or higher, 30% had completed intermediate or secondary education, while 20% possessed basic literacy or informal schooling. The occupational profile showed that 40% were business owners, 33% were private or service employees, 20% were residents or homemakers, and 7% were representatives of the Shaheen Orchards management or municipal staff.

During discussions, most participants raised minor concerns related to the construction phase, such as dust emissions, noise, and temporary disturbance to access routes. However, these issues were viewed as temporary and manageable through proper mitigation and site management. Respondents acknowledged that the project falls within a planned and controlled housing society, where regulatory oversight and infrastructure support are already well established.

Notably, over 70% of respondents expressed that the project would positively contribute to the local environment and community, highlighting expected benefits such as:

- Improved commercial accessibility and convenience for residents.
- Creation of new business and employment opportunities.
- Enhancement of local infrastructure and property value.
- Introduction of environmentally friendly features such as solar panels, green landscaping, and waste management systems.

Overall, the stakeholder consultation demonstrated strong public acceptance and community support for the proposed extension. The process successfully enhanced awareness, gathered constructive feedback, and fostered a sense of shared responsibility toward environmental protection and sustainable development within Shaheen Orchards. The insights collected have

been incorporated into the Environmental Management Plan (EMP) to ensure transparency, effective mitigation, and continuous community engagement throughout the project's life cycle

CHAPTER-7: CONCLUSION AND RECOMMENDATIONS

7.1 Conclusion

The proposed Commercial Building Extension Project at Shaheen Orchards Housing Scheme, located in Mouza Bado Muraday Khurd, along Sharaqpur Road, Tehsil and District Sheikhupura, represents a well-planned and environmentally compliant development initiative under the EIA framework, the extension is designed to enhance the existing commercial infrastructure within the housing scheme. The project integrates modern architectural design, efficient space utilization, and sustainability-oriented features such as solar panels, a rooftop garden, rainwater harvesting system, and a solid waste segregation mechanism.

The Environment Impact Assessment (EIA) has evaluated potential environmental impacts during both construction and operational phases. Most of these impacts are localized, short-term, and manageable through effective implementation of the proposed mitigation and monitoring measures. The site is situated within a planned residential and commercial area, with no ecologically sensitive or culturally significant features in proximity.

Stakeholder consultations indicate community support for the project, recognizing its role in improving local amenities, creating employment opportunities, and promoting sustainable urban development. With the integration of mitigation and monitoring measures outlined in the Environmental Management Plan (EMP), the project is expected to proceed in full compliance with environmental regulations, contributing positively to the socio-economic growth and aesthetic value of Shaheen Orchards Housing Scheme without causing any significant adverse environmental impacts.

7.2 Recommendations

To ensure environmental sustainability and regulatory compliance throughout the life of the project, the following recommendations are proposed:

7.1 Environmental Compliance

- Ensure strict implementation of all mitigation and monitoring measures prescribed in the approved **EIA** and **Environmental Management Plan (EMP)**.
- Engage a **qualified environmental consultant** for periodic monitoring of air, noise, and water quality at the site.

- Maintain continuous coordination with the **Punjab Environmental Protection Agency (EPA)** and submit compliance reports as required under **PEPA 1997**.

7.2 Construction Phase Management

- Restrict high-noise construction activities to **daytime hours only** and use equipment fitted with silencers.
- Provide all site workers with Personal Protective Equipment (PPE) and conduct routine health and safety training sessions.
- Ensure safe access routes within Shaheen Orchards to prevent inconvenience to nearby residents and road users.

7.3 Waste Management

- A comprehensive **waste management system** will be implemented within the project site to ensure a clean, safe, and environmentally sustainable environment. A **designated solid waste collection point** will be established to facilitate organized and efficient waste handling. Waste segregation practices will be strictly followed, dividing waste into **organic, recyclable, and residual categories** at the source to promote recycling and minimize landfill disposal.
- Timely collection and proper disposal of all solid waste will be ensured through **Shaheen Orchards maintenance services**, in compliance with local municipal and environmental regulations. Regular monitoring will be carried out to maintain hygiene, prevent littering, and ensure that all waste generated from residential, commercial, and common areas is handled responsibly.

7.4 Water and Sanitation

- Utilize the **underground water storage tanks** efficiently to meet daily operational water requirements.
- Ensure proper operation of the **septic tanks** installed within the site to prevent leakage or groundwater contamination.
- Promote **water conservation practices**, including reuse of treated greywater for irrigation or landscaping purposes.

- Maintain sanitation facilities for all staff and ensure waste disposal through approved sewerage channels of the housing scheme.

7.5 Energy Efficiency

- Monitor and maintain the **rooftop solar panel system** for optimum energy production and reduced grid dependency.
- Use **energy-efficient electrical fittings** such as LED lights and automatic motion sensors in public and utility areas.
  Conduct periodic **energy audits** to identify areas for improvement in energy consumption patterns.

7.6 Fire Safety and Emergency Response

- Install and maintain firefighting systems including extinguishers, alarms, and water hydrants as per building code requirements.
- Conduct quarterly fire safety drills and ensure that emergency exits and escape routes remain unobstructed and clearly marked.
- Provide on-site staff training for emergency preparedness and response procedures

7.7 Green Spaces and Landscaping

- Sustain the rooftop garden and landscaped areas with native, low-maintenance plants.
- Monitor plant health and irrigation to preserve the ecological and aesthetic function of the green zones.

7.8 Institutional Support and Capacity Building

- Appoint a dedicated HSE (Health, Safety, and Environment) Officer or Facility Manager responsible for monitoring environmental performance.
- Conduct regular training and awareness programs for all employees, contractors, and maintenance personnel on EHS practices.
- Develop an internal reporting system for recording and responding to environmental or safety incidents promptly