

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT



NISA-SF
PRIVATE LIMITED

Installation of Life saving devices
manufacturing facility by

Nisa-SF

Private limited

at 10 Km Muridke-Sheikhupura road.



SUSTAINABLE
FUTURE



LIFE
SAVING DEVICES



RESPONSIBLE
MANUFACTURING



ENVIRONMENTAL
STEWARDSHIP



CLEANER
TOMORROW



PROTECT
ENVIRONMENT



SAFE
COMMUNITY &
HEALTH



REGULATORY
COMPLIANCE



A BETTER WORLD
FOR FUTURE
GENERATIONS

Building a healthier
tomorrow with care for
people and planet.

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Executive Summary



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1. BACKGROUND

At the time of independence, Pakistan had virtually no pharmaceutical industry in place with traders mostly engaged in importing medicines from various countries. The total healthcare spending in Pakistan (Government and Private) amounted to PRs. 185 bn (US\$ bn3.2), a mere 4% of GNP. The healthcare sector is not well developed and almost 90% of healthcare expenditure is out of-pocket expense, meaning old and sick have to pay from their pockets for health care.

The demand for Pharmaceuticals is fueled by a high population growth rate (2.00% in 2025), rising life expectancy (62.6yrs) and consequent rise in older age group. At the same time, Pakistan has >50% of its population that lies below the age of 19 years. Infant mortality is high, at 74.4 per 1000 live births, as is maternal mortality. These factors along with increasing urbanization, increasing number of doctors and private investment in new hospitals and clinics will keep Pakistan a growing market for Pharmaceutical products.

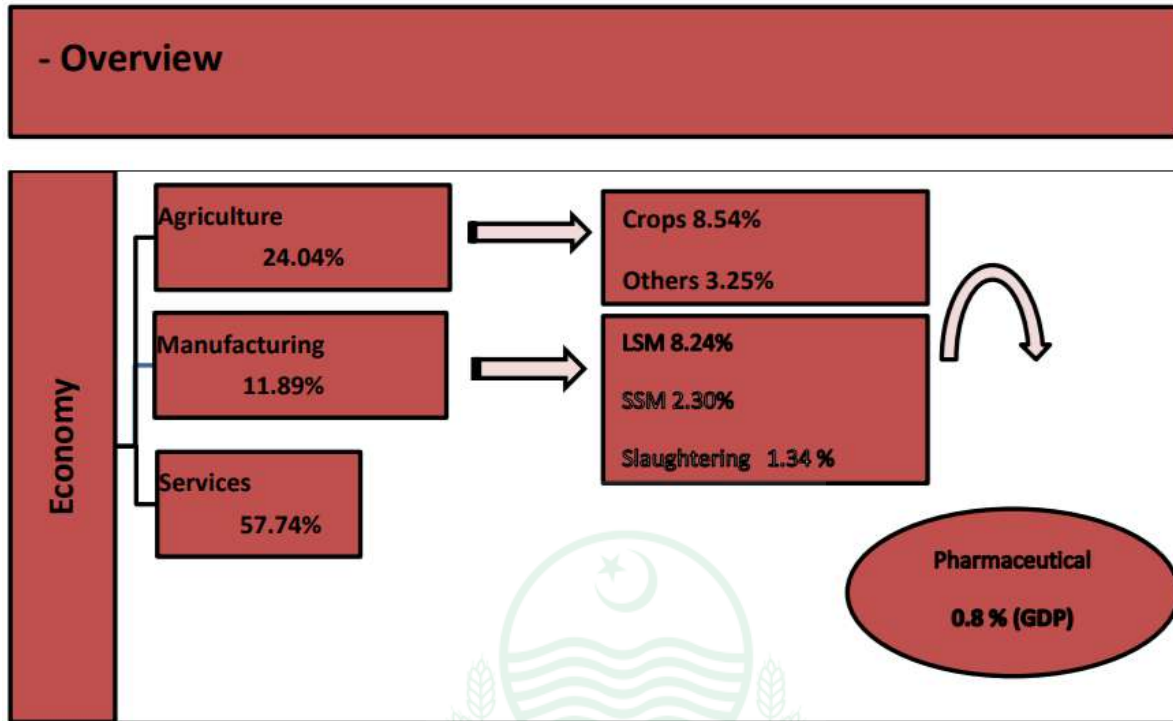
Pakistan's pharma sector in 2025 shows strong growth, nearing \$2 billion in market size, driven by price deregulation and a surge in exports (34% growth in FY25) into global generics markets, though facing challenges with high import dependency (90% for raw materials) and ensuring affordability through volume growth beyond price hikes, with focus on API production and regulatory reforms for sustainable expansion.

The global pharmaceutical industry has experienced significant growth during the past two decades, with revenues totaling around 1.6 trillion U.S. dollars in 2023. With growth like that, the industry's size is now comparable to the gross domestic products (GDPs) of countries like Spain, Mexico, or Australia.

We can see the pharmaceutical has 15.70 % growth rate as well as share in GDP is 0.8 percent. As Large-Scale manufacturing has great contribution as well as linkage with others sectors. It has 8.24% in FY 24.

The production of Pharmaceutical grew sharply by 15.7 % in FY24 against the sustained decline of 28.8 % in the previous year. Productions of syrups and tablets contributing around 84 % of pharmaceutical production remain the principal product lines contributing almost entirely to the growth. A number of factors supported production of pharma during FY24. This includes increase

availability of raw materials, deregulation of drugs, prices by DRAP in between rising cost of raw materials and export increased.



Source: Economic Survey of Pakistan & SBP Annual Report 2023-24

There are about 400 licensed Pharmaceutical companies, including 30 foreign companies those together accounts for 80% of the country's pharmaceutical consumption. Foreign multinationals (MNCs) had a market share of 38% in 2004, however they are gradually losing market share to local companies which offer cheaper variants (branded generic drugs) priced usually at 20-25% lower than the MNC drugs. The per capita consumption of Pharmaceuticals in Pakistan is currently is less than USD 10 on a yearly basis as the modern medical and Pharmaceutical care is available mostly in large cities and a vast majority of rural population consumes the Homeopathic, Ayurvedic, or other forms of local and traditional (Unani) remedies. As more of the rural population shifts towards the cities they will be exposed to availability of modern medical care including the Pharmaceuticals.

Large scale manufacturing (LSM) is essential part of any economy, in Pakistan for economic growth has linkage with other sectors too. The pharmaceutical sector is classified industrial

activities segment of economy. The LSM growth rate 15.70 % growth rate whereas contribution in GDP is 0.8.

As most of the industries in Pakistan are ruled by private sector, the pharmaceutical industry also depends on many factors. These factors may be political, social or economic level. Pharmaceutical industry is also one of them. This industry faces many challenges and competitions. Among 750 registered pharmaceuticals units in Pakistan, 400 produced active finished drugs which also include those 24 units run by multi-national companies. In Pakistan, multi-national (MNC) and national units are working with a ratio of 2:3. GSK, a multi-national with 11.60% while among national Getz has a market share of 3.75%. Above figure depicts top 10 companies in Pakistan.

Keeping in view the demand of pharmaceutical products in Pakistan, project proponent of M/S Nisa.SF Pvt. Ltd has been planned to install a pharmaceutical unit in a buildings of former Becton Dickinson (BD) pharmaceutical manufacturing unit located at 10 km Muridke- Sheikhpura Road, Tehsil Muridke district Sheikhpura. In 2018 the BD company winded up his operation and the same factory building was purchased by NISA-SF private limited, Islamabad.

2. OBJECTIVES OF THE PROJECT:

The main objective of this project is to establish a pharmaceutical unit which is essential medical devices manufacturer like syringes and IV sets. To contribute to the production of essential pharmaceutical production in Pakistan and make the country self-sufficient in medicines and drugs on the safe standard and quality which was being observed by the BD manufacturer at the same premises.

The purpose of this EIA study is to identify the possible beneficial and adverse environmental impacts of the project as presently envisaged and propose the applicable mitigation measures to be implemented during construction and operational stages of the project to minimize the negative impacts and to fulfil the legal requirement of the project under section 12 PEPA, 2012.

To fulfil the social and legal binding upon Nisa. SF Pvt. Ltd. for compliance of Provincial Environmental Quality Standards (PEQS) for industrial waste, industrial emissions, ambient air, motor vehicles and noise in letter and spirit.

Section 12 of Punjab Environment Protection Act of 1997 Amended 2012 binds the developer (proponent) to submit an EIA report to Provincial EPAs and get approval for construction and operation phase of the project in a manner prescribed in IEE/EIA Regulations 2022. To fulfil the legal obligations the project has been analyzed for possible positive and negative, social and environmental impacts and their abatement, for submission to Punjab-EPA, Lahore for issuance of Environmental approval under above said regulation.

3. BRIEF DESCRIPTION:

NISA.SF (Pvt.) Ltd. is a Pakistani medical device manufacturer founded in 2017, specializing in high-quality injectable disposables like syringes, needles, and drip tubes. The company focuses on sterile, precision-engineered products, serving local healthcare and expanding into global markets, supported by a skilled workforce. Its key products are Auto-disable syringes, infusion sets, needles, and other medical consumables. NISA.SF is actively involved in international supply chains, importing raw materials from countries including China, South Korea, and the United Arab Emirates, according to trade data from 2025-2026.

The company was established after purchasing a factory formerly associated with BD Company in Pakistan. The company aims to provide high-quality, reliable medical devices while ensuring safety and innovation to improve patient outcomes.

The proposed project by Nisa-SF Company involves the establishment and operation of a modern industrial facility aimed at manufacturing high-quality products in compliance with national and international standards in the old premises of BD company. The project is designed to contribute to economic growth by generating employment opportunities, supporting local industries, and promoting sustainable industrial development.

The project site was selected considering accessibility, availability of infrastructure, and minimal environmental sensitivity. After taking over from the BD company, the facility will include production units, storage areas, administrative offices, and utility systems such as water supply for cooling, and energy provision. Advanced machinery and efficient production processes will be employed to ensure optimal resource utilization and reduced environmental footprint.

During the operational phase, the project will utilize raw materials and energy as key inputs. Most of the raw material is already finished e.g. needles, syringe pistons etc. the formulation and assembling of different high-grade plastic parts does not involve any emissions or effluents. Therefore, no such notable mitigation measures will be required except quality control and assurance. Water conservation and energy conservations will be the aim focus for the environmental management. Therefore, it will have negligible environmental impacts during installation and operation phase. No construction is involved in this project as it will be installed in the previous building purchased from the BD company.

This facility has license of Drug Regulatory Authority Pakistan (DRAP) to manufacture the important and life saving medical equipment and devices.

The project also emphasizes compliance with environmental regulations and standards set by relevant authorities. Environmental management practices, monitoring plans, and safety protocols will be implemented to ensure the protection of air quality, water resources, soil integrity, and surrounding communities.

Overall, the Nisa SF Private Limited project aims to balance industrial growth with environmental sustainability by adopting environmentally responsible practices and contributing positively to the socio-economic development of the region.

4 SITE DESCRIPTION:

The proposed project is a Pharmaceutical unit. It is located on 10 km Sheikhpura-Muridke Road. Site is industrial land use surrounded by the green agriculture farms. The topography of the area is quite typical of the Punjab plains. The soil mainly consists of silt, clay and fine sands.



Groundwater table in the area exists at 5-8 m depth below the existing ground level and has almost sweet taste. The site is presently open and have no trees or vegetation.

5. Environmental Assessment Team:

Sustainable Environmental Solutions prepared this EIA. A team of experts comprising of experienced Environmental scientists, engineers and Ecologist paid visits to the project site. Discussions were held on project components and detail design parameters. Meetings were also held with Project owner of Nisa-SF for obtaining the basic information about site and aims and objectives of project. He provided the baseline data and necessary technical, administrative, and environmental information of the project. The following team of Consultants remained engaged for preparation of the Initial Environmental and social Examination Report:

- Mr. Muhammad Farooq Alam, Senior Environmentalist and team leader (SES)
- Mr. Zahid Ali, GM
- Mr. Usman ul Haqq, sr. Environmentalist (SES)
- Saghir Ahmed, Pak Green Environment laboratory,
- Mr. Shafqat Saeed Farooqi, Environmental officer (SES)
- Muhammad Hamza Arif, Environmentalist (SES)

6. PROJECT BASELINE CONDITIONS:

As the area around the project is agriculture and industrial in nature with some cluster of houses settlements. The houses are mud and cement plastered. Village UCC is the closest population which is about 0.6 Km from site. 70 % population of these villages depends upon agriculture while 30 percent depend upon the labor, service and business related to the surrounding industry and commercial centers. Farmers and labor are the significant community in the project area. Economy of the area is intermediate. The proposed site is adjacent on main road and was formerly being used for tent manufacturing which has been defunct. Presently there are other industries on the this

Sustainable Environmental Solutions



road which include rice processing, engineering and small manufacturing. The nearest town is Muridka which is 10 Km away. This town is center of industrial and business activity in the area.

The Ambient air monitoring at site shows the clear ambient air quality as there is no point source of pollution. only the traffic on the Muridka road is source of air pollution near this site. The data of Meteorology Department, Government of Pakistan was also consulted for meteorological parameters.

The proposed project will cause positive socio-economic impacts in area by:

- Creating new direct and indirect job opportunities, although on small scale.
- Increasing the value of the land of the area.
- Change in attitude and outlook of the people in nearby villages.

The following stake holders were identified from the following groups.

- Local people
- Proponents
- Government Agencies
- NGOs
- Influential people
- Technical persons
- Poor People

Total 25 people from different stake holders were interviewed which had unanimous opinion about the usefulness of the project.

7. Waste water and disposal option:

A small quantity of water approximately 100 liter per day is used as cooling source. Hence no significant water will be generated as waste water during the operation phase. The waste water generated in small quantity and clean hence, will be reused for cooling and gardening.

8. Solid waste disposal:

During operation of pharmaceutical unit small amount of solid waste will be generated. The syringes and IV sets have long shelf life hence its wastage is minimum. Expired pharmaceutical products, if any, will be stored in separate room and sold out to EPA approved incineration facility. Reuse and recyclable material will be collected separately. Solid waste from offices and kitchens will be disposed of at designated place by TMA.

9. Environmental Impact on Air quality and Noise:

No significant impact on Air quality will be seen. Also no or very less noise will be generated during the operation phase.

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CHAPTER-1

INTRODUCTION



1.1 BACKGROUND

At the time of independence, Pakistan had virtually no pharmaceutical industry in place with traders mostly engaged in importing medicines from various countries. The total healthcare spending in Pakistan (Government and Private) amounted to PRs. 185 bn (US\$ bn3.2), a mere 4% of GNP. The healthcare sector is not well developed and almost 90% of healthcare expenditure is out of-pocket expense, meaning old and sick have to pay from their pockets for health care.

The demand for Pharmaceuticals is fueled by a high population growth rate (2.00% in 2025), rising life expectancy (62.6yrs) and consequent rise in older age group. At the same time, Pakistan has >50% of its population that lies below the age of 19 years. Infant mortality is high, at 74.4 per 1000 live births, as is maternal mortality. These factors along with increasing urbanization, increasing number of doctors and private investment in new hospitals and clinics will keep Pakistan a growing market for Pharmaceutical products.



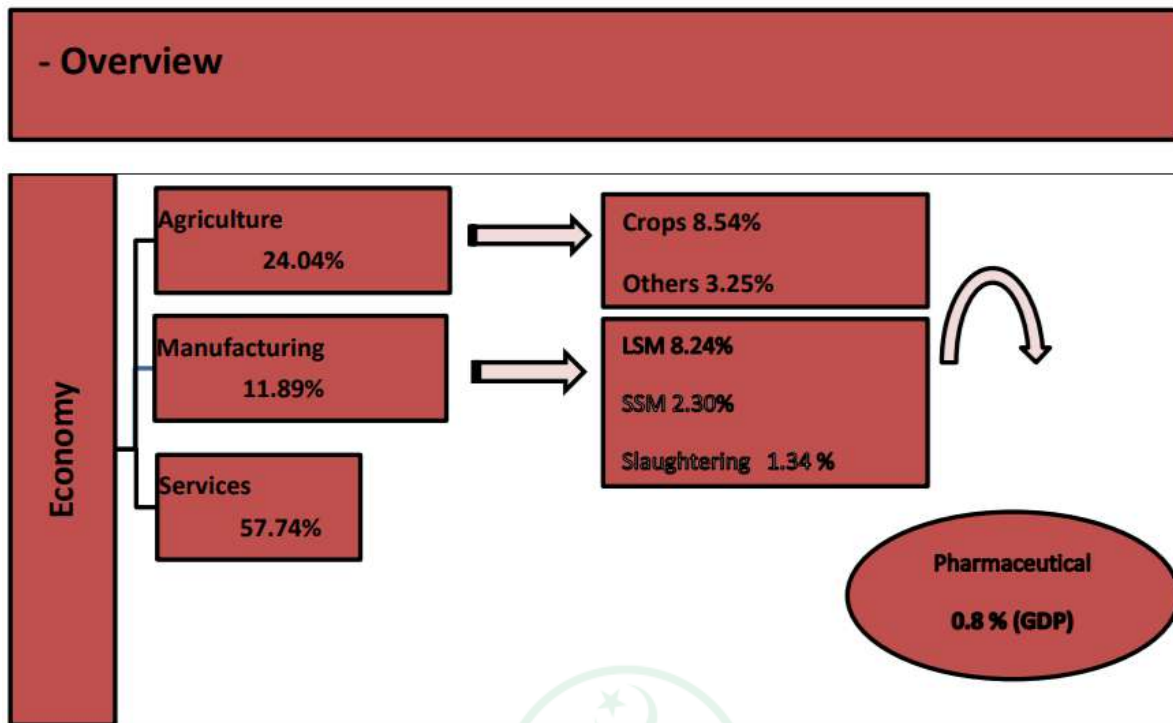
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Keeping in view the demand of pharmaceutical products in Pakistan, project proponent of M/S Nisa.SF Pvt. Ltd has established a small-scale pharmaceutical unit located at 10 km Muridke-Sheikhupura Road, Tehsil Muridke district Sheikhupura.

2. OBJECTIVES OF THE PROJECT:

The main objective of this project is to establish a pharmaceutical unit which formulate the syringes and IV catheters to contribute to the production of pharmaceutical production in Pakistan and make the country self-sufficient in medicines and drugs.

The purpose of this EIA study is to identify the possible beneficial and adverse environmental impacts of the project as presently envisaged and propose the applicable mitigation measures to be implemented during construction and operational stages of the project to minimize the negative impacts to fulfil the legal requirement of the project under section 12 PEPA, 2012.

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1.3 PROJECT PROPONENT:

The project proponent is

Mr. Inayat Ullah

Chief executive officer

Address: House # 04, St.#01, Sector E, FHA Phase II, Islamabad.

1.4 Scoping session

The Punjab Regulations IEE/EIA 2022, Policy and Procedure for filing, review and approval of environmental assessments and guidelines for public consultation were key documents which served basis for scoping of the EIA. The concerned departments were visited and had discussions to chalk out the scope of the report.

District Officer Environment, Sheikhupura is the key stake holder who has to make site inspection report which covers the scope of report and details of the site and its suitability. His office was visited who opined pharmaceutical manufacturing unit comes in schedule II of IEE/ EIA Regulations. He also opined that water should also be treated before disposal.

After detailed discussion with stake holders it was decided that format of the IEE given in the “Policy and Procedure for filing, Review and Approval of Environmental Assessments” is the final and report will be prepared on its format mentioned in section 2.3 of above-mentioned document.

1.5 Environmental Assessment Team

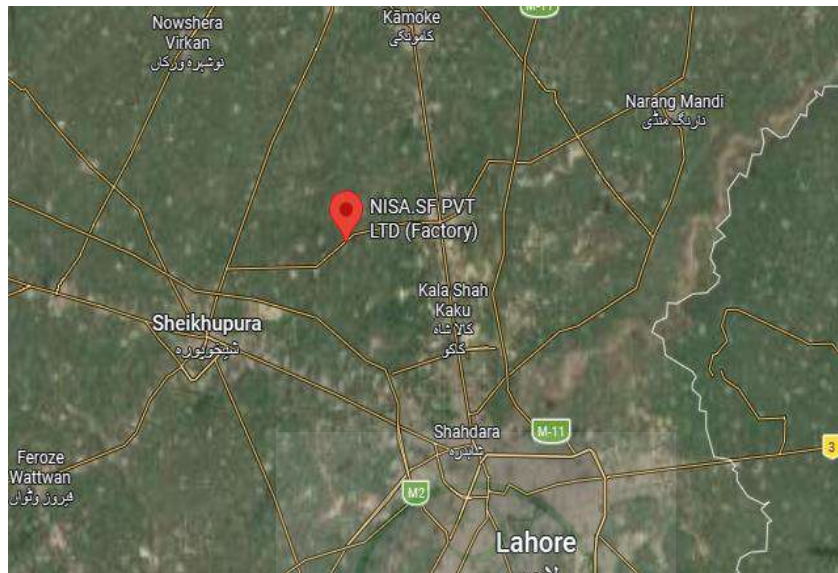
Sustainable Environmental Solutions prepared this EIA. A team of experts comprising of experienced Environmental scientists, engineers and Ecologist paid visits to the project site. Discussions were held on project components and detail design parameters. Meetings were also held with Project owner of Nisa-SF for obtaining the basic information about site and aims and objectives of project. He provided the baseline data and necessary technical, administrative, and environmental information of the project. The following team of Consultants remained engaged for preparation of the Initial Environmental and social Examination Report:

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1.6 NATURE, SIZE AND LOCATION OF THE PROJECT

1.6.1 Location



The proposed project is a pharmaceutical manufacturing unit named as M/S Nisa-SF Pvt. Ltd. Situated at 10 km on main Muridke-Sheikhupura road. The document of land is attached at Annexure-I. The proposed site plan map of the site is given below and also attached at Annexure-II along with layout map.

1.6.2 Nature and Size

BRIEF DESCRIPTION:

This pharmaceutical unit have the capacity of producing almost **100000** sets of IV catheters and also have the capacity of producing **4lac to 5lac** syringes on daily basis. They offer 100+ medical devices catering to various healthcare needs—from diagnostic tools to surgical instruments. **Product** details are given in the following lines

BM 1ml Insulin 100 Units

BM AD Syringes

BM D/A Syringes

BM D/A IV Set NS-002

BM D/A IV Set NS-022
BM D/A Hypodermic Needles
BM D/A Scalp Vein Set
BM D/A Blood Transfusion Set
BM D/A Suction Tube
BM D/A Dialysis Tube
BM D/A AV Fistula Needle
ANGIOWAY D/A Pressure Monitoring Line
BM D/A IV Burette
HP D/A 3-Way Stopcock
DOSIFLOW PLUS D/A Flow Regulator Extension Line
Super Stopper HP D/A 3-Way Stopcock with Extension Tube
BM D/A Nelaton Catheter
BM D/a Suction Catheter
BM D/A Umbilical Cord Clamp
BM D/A Feeding Tube
BM D/A IV Catheter
BM Disposable Nasal Oxygen Tube
Oral Dosing Device



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Raw materials used in the process

Poly propylene,
PVC,
ABS,
HDPE,
Rubber gas kit,
needle SS and medical grade,
paper, blister plastic film,

IV parts imported.

ethylene Oxide and CO₂ almost 20 kg/badge 3 badge per day

Water requirement for this proposed project is small. Small quantity of waste water will be generated from condensation process in which water is sprinkled by showers on to the cylinder having the CO₂ and ethylene Gas.

The layout of proposed project is attached at **Annexure-**.

1.7 CAPITAL COST ESTIMATES

Cost of the proposed project is 200 million including cost of land.

1.8 STUDY AREA

For an environmental assessment Study, a clear delineation of the Study Area is important within which the impacts must be considered. In the light of this, impacts on the existing environment have been considered in a geographical area (Study Area) of the proposed Project. The boundary of Study Area for the proposed pharmaceutical unit was limited due to its low adverse impact on surrounding environment of the area. As the area is mixture of commercial, industrial and agriculture in use.

1.9 STRUCTURE OF THE REPORT

The EIA report is structured in the light of guidelines for Review and filling of IEE and EIA regulations. It includes non-technical or executive summary and followed by eight (8) chapters with Chapter-1 provides introduction of the proposed project, Chapter 2 provides the country's environmental policy, legal and administrative framework applicable to the proposed project together with the guidelines, Chapter 3 describes in detail the existing environmental baseline

conditions of the Study Area considering the physical, ecological and social domains of environment Chapter 4 presents the description of the project including components ,design parameters, detail of infrastructure facilities etc. Chapter 5 exhibits the Public consultation and social survey. Chapter 6 exhibits the impacts assessment at construction and operational stages of the proposed project along with their mitigation measures, Chapter 7 depicts Environmental Management and Monitoring Plan (EMMP) along with proposed institutional framework required for effective implementation and monitoring and Chapter 8 gives the conclusions and recommendations about the viability of the project.



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CHAPTER - 2

ENVIRONMENTAL LEGISLATIVE REQUIREMENTS AND FRAMEWORK

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2.1 GENERAL

This Chapter deals with the relevant policy, legal and administrative frameworks instituted by the Government of Pakistan and Punjab for the protection of environment. All the relevant provisions of these policy and legal frameworks have been duly considered in this EIA study. In addition to this, the roles and responsibilities of the Proponent and other key players such as EPA Punjab have also been discussed in this section. The legal set of documents which will be applicable to this project is also discussed in this chapter.

2.1.1 POLICY FRAMEWORK

The Ministry of Environment was responsible authority for policy making on environmental protection in Pakistan. With the 18th amendment all the powers of environmental legislation have been entrusted to provincial government. Presently EPD Punjab is the legislator as well as regulatory department in the present scenario. The rules laws and emulations draft are whetted by law department, provincial Environment Protection Council and are finally approved by provincial assembly. The set of rules and regulations applicable to the project by implemented EPD are discussed in this chapter.

1. National Environment Policy, 2005

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

2.2 LEGAL FRAMEWORK

The Government of Pakistan (GOP) has promulgate laws/acts, regulations and standards for the protection, conservation, rehabilitation and improvement of the environment. In addition to this, they have also developed environmental assessment procedures governing development projects. Following are the glimpse of these laws and procedures relevant to the proposed Project.

1. Pakistan Environmental Protection Act 1997

The Act was enacted on December 06, 1997 by repealing the Pakistan Environmental Protection Ordinance 1983. It provides the framework for implementation of the PNCS, 1992 establishment of provincial sustainable development funds, protection and conservation of species, conservation of renewable resources, and establishment of Environmental Tribunals, appointment of Environmental Magistrates, Initial Environmental Examination (IEE), and Environmental Impact Assessment (EIA).

Section 11 binds the proponents to emit the effluents and emissions within the prescribed limits as notified in PEQS. Section 12 of the Act stresses the need to carry out EIA/IEE study prior to construction or operation of a project. A committee under the chairman ship of Director General EPA reviews the report and gives its decision for approval or otherwise of any project. Environmental approval is issued for construction phase. After completion of the project construction approval for operational phase is also required to be obtained.

2. The Punjab Environmental Protection Act 1997 Amended 2012

After implementation of the 18th amendment government of Punjab, EPD adopted the federal act as such which is now called The Punjab Environment Protection Act, 1997 amended in 2012. All the rules and regulation made here under have been adopted by EPD.

3. Pakistan Environmental Protection Agency (Review of IEE/EIA) Regulations, 2000

These regulations provide criteria for projects requiring IEE and EIA. The projects have been divided into two schedules according to the scoping of project. The construction of pharmaceutical unit lie in schedule one which require IEE to be submitted for environmental approval before provincial or federal Environment protection agency. They also briefly describe the procedure for preparation and review of environmental reports in the department. (**Annex- III IEE Regulation 2000**)

Pak-EPA published a set of guidelines for conducting IEE/EIA and environmental management of different types of projects. The EIA/IEE process followed in Pakistan is provided in figure 2.1



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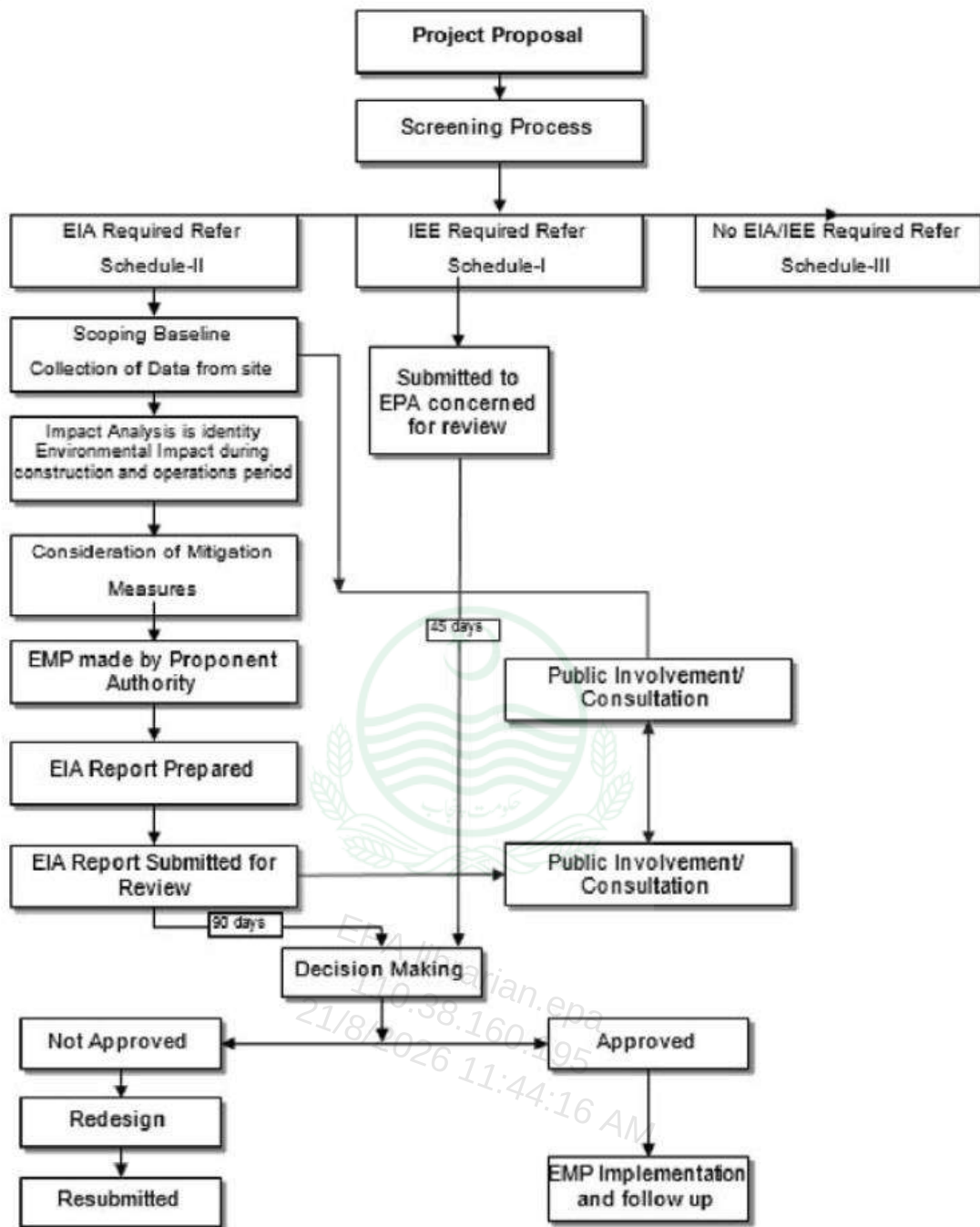


Figure 2.1 IEE/EIA Process in Pakistan

2. Punjab Municipal Solid Waste Management Guidelines, 2007

Punjab Municipal Solid Waste Management Guidelines, 2007 provide the general guidance to the provincial Government departments, local governments, private operators and other agencies that initiate to operate any solid waste management activity in urban areas.

The present set of guidelines is aimed to cover only the municipal solid wastes. Therefore, hazardous wastes do not come under the preview of these guidelines. Various components of solid waste management such as waste generation and collection, waste transfer, recovery of useful components, waste incineration, composting, bio-gas generation and land filling are covered in these guidelines giving a technical guidance to do these operations with minimal impacts to the environment. For the disposal of waste by land filling, it provides the general, design and operational guidelines. Apart from that, these guidelines also explain the pollution control system for the landfill site with design details. As far as environmental monitoring is concerned, these guidelines also prescribed the National Environmental Quality standards for Municipal and liquid Industrial effluent and ground Water Quality Monitoring Standards.

1. Pakistan Environmental Assessment Procedures, 1997

Pakistan Environmental Assessment Procedures (1997) is, in fact, a package, which contains the following, sets of information relevant to the proposed Project:

a) **Policy and Procedures for Filing, Review and Approval of Environmental Assessment Reports**

It describes environmental policy and administrative procedures to be followed for filing of environmental examination/assessment reports by the proponents and their review and approval by the concerned environmental protection agencies.

b) Guidelines for the Preparation and Review of Environmental Reports

These guidelines are developed to facilitate both the proponents and decision makers to prepare reports (inclusive of all the information contained therein) and carry out their review so as to take informed decisions.

c) Other Relevant Laws**i) CDGL Solid Waste Management Bye - Laws, 2005**

All powers were delegated under section 192 of the fifth schedule of Punjab Local Government Ordinance, 2001, to Zila Nazim on behalf of Zila Council to make and promulgate Solid Waste Management Bye-Laws, 2005. These laws explain the powers of City District Government Lahore, for the collection, transfer and disposal of solid waste from the public areas. These laws also define the penalties for violations concerning the solid waste pollution. According to the Bye -Laws, the City District Government concern may appoint adequate staff and adopt other measures for carrying out the effective implementation of these by laws. DOE Environment playing dual role. He exercises the powers of 1997 through DG EPA and PLGO through DCO.

iii) Canal and Drainage Act, 1873

This Act entails provisions for the prevention of pollution of natural or man-made water bodies

The Provincial Government may, by notification in the official gazette, prohibit the discharge of any effluent, including any solid or liquid matter or combination of them from industrial, municipal or any other source, into any river, canal and drainage work including any natural drainage channel.

In case of contravention of sub-section (1), the Divisional Canal Officer, after such enquiry including taking of sample, may impose such special drainage charges as may be prescribed and shall take other necessary steps to prevent such contravention and consequential cost so incurred shall also be recoverable from the person found responsible for such contravention.

After the publication of notification under sub-section (1), any person, organization or entity, interested in discharging such effluent into any river or drainage work, including any natural drainage channel, shall apply to the Divisional Canal Officer or any other person authorized by the Provincial Government in this behalf, for grant of permission for the discharge of such effluent.

The applicant shall obtain a certificate of no adverse impact of such discharge on environment from the authority designated in this behalf under any law for the time being in force relating to environment.

iv) Labor Laws

Construction and operational activities during the course of construction could affect the occupational health of the workers. Quantitative national standards for occupational health are yet to be developed in Pakistan and employers are required to abide by the labor laws in respect of their own employees and also ensure that contractors to follow the relevant labor laws and rules relating to safety of workers. The proponents will ensure that the labor force engaged is not exposed to any danger by monitoring the contractors' work frequently. Labor Department Government of Punjab is the relevant department who cares for the implementation of labour laws.

v) Pakistan Penal Code, 1860

The Pakistan Penal Code 1860 deals with offences where public or private property or human lives are affected due to the intentional or accidental misconduct of an individual or body of people. In the context of the environment, the Penal Code empowers the local authorities to control noise, noxious emissions and disposal of effluents. The NEQS enforced by the EPA supersede the application of this legislation on industries and municipalities. The Penal Code, however, can provide a basis for the client to coordinate its activities with the local authorities to ensure that its construction activities do not become a cause of public nuisance or inconvenience.

vi) Factories Act, 1934

The clauses relevant to the proposed project are those that concern the health, safety and welfare of workers, disposal of solid waste and effluent and damage to public and private property. The Act also provides regulations for handling and disposing of toxic and hazardous materials. Given that the construction activity is classified as 'industry, these regulations will be applicable to the project contractors. In addition to this, the following will also be consulted:

Employees' Cost of Living Relief and Allowances - Workers' Children (Education Law) Companies Profit (Workers' Participation) Law, Law of Essential Services, Industrial Relations Law, Workers' Welfare Law, Employees' Old Age Benefit Law, The Shop Act, The Law of Social Security, The Law of Payment of Wages and Minimum Wages, The Law of Industrial and Commercial Establishments

vii) Punjab Wildlife (protection, preservation, conservation and management Act 1974

This Act provides the protection, preservation, conservation and management of wildlife in the Province of the Punjab.

- **Wildlife Sanctuary**

The wildlife sanctuary shall be set aside as undisturbed breeding ground for the protection of wildlife and access thereto for public shall, except in accordance with the rules, be prohibited and no exploitation of forest therein shall be allowed except for reducing fire hazards, epidemic or insect attacks or other natural calamities.

No person shall—

- (i) Enter or reside,
- (ii) Cultivate any land,
- (iii) Damage or destroy any vegetation,
- (IV) Hunt, kill or capture any wild animal or fire any gun or other firearm within one mile of the boundaries,
- (v) Introduce any exotic species of animal or plant,
- (vi) Introduce any domestic animal or allow it to stray,

- (vii) Cause any fire, or
- (viii) Pollute water in wild life sanctuary

- **Game Reserve**

No hunting and shooting of a wild animal shall be allowed in the game reserve, except under a special permit, which may specify the maximum number of game animal that may be killed or captured, the area and duration for which such permit shall be valid.

The number of occasions on which hunting and shooting may be allowed shall not exceed two in a year.

- **National park**

A national park shall be accessible to public for recreation, education and research subject to such restrictions as Government may impose.

Provision for access roads to and construction of rest houses, hostels and other buildings in the national park along with amenities for public may be so made and the forest therein shall be so managed and forest produce so obtained as not to impair the object of the establishment of the national park.

The following acts shall be prohibited in a national park

- (i) Hunting, shooting, trapping, killing or capturing of any wild animal in a national park or within one and a half mile radius of its boundary;
- (ii) Firing any firearm or doing any other act which may disturb any animal or bird or doing any act which interferes with the breeding places;
- (iii) felling, tapping, burning or in any way damaging or destroying, taking, collecting or removing any plant or tree therefrom;
- (iv) Clearing or breaking up any land for cultivation, mining or for any other purpose
- (v) Polluting water flowing in and through the national park.

1. PUBLIC PARTICIPATION & CONSULTATION

Public consultation and participation are mandatory for IEE/EIA procedure. Sectoral guide lines issued by Pakistan environmental agency are required to be consultant during the process of public consultation. EIA/IEE regulations 2000 also give guide

Line for public participation of schedule II projects. An advertisement is published in to leading newspaper for comments of the public on proposed project. Duration of thirty days is fixed for public comments. Finally a public hearing is conducted on any public place where each stakeholder is heard by the representative of Director General of EPA Punjab. Proper remedial measure/action is taken by EIA section on the reservation of stakeholders.

2.4 PUNJAB ENVIRONMENTAL QUALITY STANDARDS (PEQS)

2.4.1 Punjab Environmental quality standards for Ambient Air

EPA Punjab published environment quality standards for ambient air in the Punjab gazette notification no. SO(G)/EPD/7-26 -2013 , dated 15-8-2016 for compliance of ambient air quality. Compliance of is the requirement of approval of IEE/EIA. Ministry of Environment notified these standards in 1993. EPA Punjab revised previous environment quality standards and established a set of municipal and liquid industrial effluent standards (Amended 2016). They furnish information on the permissible limits for discharges of municipal and industrial effluent parameters and industrial gaseous emissions in order to control environmental pollution. A copy of these standards is attached as (**Annexure-I (PEQS) All**).

Table- 2.1 Punjab Environmental Quality Standards for Municipal and Liquid Industrial Effluents (mg/l, Unless Otherwise Defined)

Sr. No.	Parameters	Into Inland Waters	Into Sewage Treatment ⁽⁵⁾
1	Temperature or Temperature Increase	$\leq 3^{\circ}\text{C}$	$\leq 3^{\circ}\text{C}$
2	pH value (H^{+}).	6-9	6-9

Sr. No.	Parameters	Into Inland Waters	Into Sewage Treatment ⁽⁵⁾
3	Biochemical Oxygen Demand (BOD) ₅ at 20°C ⁽¹⁾	80	250
4	Chemical Oxygen Demand (COD) ⁽¹⁾	150	400
5	Total Suspended Solids (TSS)	200	400
6	Total Dissolved Solids(TDS)	3500	3500
7	Oil and Grease	10	10
8	Phenolic compounds(as phenol)	0.1	0.3
9	Chloride (as Cl ⁻)	1000	1000
10	Fluoride (as F ⁻)	10	10
11	Cyanide (as CN ⁻) total...	1.0	1.0
12	An-ionic detergents (as MBAS) ⁽²⁾	20	20
13	Sulphate (SO ₄ ²⁻)	600	1000
14	Ammonia (NH ₃)	40	40
15	Pesticides	0.15	0.15
16	Cadmium ⁽⁴⁾	0.1	0.1
17	Chromium (trivalent and hexavalent ⁽⁴⁾ ..	1.0	1.0
18	Cooper ⁽⁴⁾	1.0	1.0
19	Lead ⁽⁴⁾	0.5	0.5
20	Mercury ⁽⁴⁾	0.01	0.01
21	Selenium ⁽⁴⁾	0.5	0.5
22	Nickel ⁽⁴⁾	1.0	1.0

Sr. No.	Parameters	Into Inland Waters	Into Sewage Treatment ⁽⁵⁾
23	Silver ⁽⁴⁾	1.0	1.0
24	Total toxic metals....	2.0	2.0
25	Zinc....	5.0	5.0
26	Arsenic ⁽⁴⁾ ..	1.0	1.0
27	Barium ⁽⁴⁾	1.5	1.5
28	Iron....	8.0	8.0
29	Manganese.....	1.5	1.5
30	Boron ⁽⁴⁾	6.0	6.0
31	Chlorine....	1.0	1.0

2.4.2 DRINKING WATER QUALITY STANDARDS

In pursuance of the statutory requirement of the Punjab Environment Protection Act amended 2012) the Punjab Environmental Protection Agency has notified drinking water quality standards 2016 notified in the Punjab Gazette. WHO drinking water quality guidelines have been used for bench marking purpose in the drinking water quality standards that are notified and given in **Table 2.2**.

Table- 2.2 Punjab Environmental Quality Standards Drinking Water

Sr. No.	Parameters	Standard values (mg/l)	WHO (mg/l)
1	Aluminum (Al)	≤ 0.2	0.2
2	Ammonium (NH ₃)	-	1.5
3	Antimony (Sb)	≤ 0.005	0.02
4	Arsenic (As)	≤ 0.05	0.01
5	Barium (Ba)	0.7	0.7

Sr. No.	Parameters	Standard values (mg/l)	WHO (mg/l)
6	Boron (B)	0.3	0.3
7	Cadmium (Cd)	0.01	0.003
8	Chloride (Cl)	< 250	250
9	Chromium (Cr)	≤ 0.05	0.05
10	Copper (Cu)	2	2
11	Cyanide (CN)	≤ 0.05	0.07
12	Fluoride (F)	≤ 1.5	1.5
13	Iron (Fe)	=	0.3
14	Lead (Pb)	≤ 0.05	0.01
15	Manganese (Mn)	≤ 0.5	0.5
16	Mercury (Hg)	≤ 0.001	0.001
17	Molybdenum (Mo)	=	0.07
18	Nickel (Ni)	≤ 0.02	0.02
19	Nitrate (NO ₃)	≤ 50	50
20	Nitrite (NO ₂)	≤ 3 (P)	3
21	Selenium (Se)	0.01(P)	0.01
22	Residual Chlorine	0.2-0.5 at consumer end 0.5-1.5 at source	-
23	Zinc (Zn)	5.0	3.0
24	Color	≤ 15 TCU	≤ 15 TCU
25	Taste	Non-Objectionable/ Acceptable	Non-Objectionable/ Acceptable
26	Odor	Non Objectionable/ Acceptable	Non Objectionable/ Acceptable
27	Turbidity	< 5 NTU	< 5 NTU
28	Total hardness	< 500 mg/l	-
29	TDS	< 1000	<1000

Sr. No.	Parameters	Standard values (mg/l)	WHO (mg/l)
30	pH	6.5-8.5	6.5-8.5
31	Alpha emitters bq/l or pci	0.1	0.1
32	Beta Emitters	1	1

2.5 OCCUPATIONAL HEALTH

Construction and operational activities could affect the occupational health of the workers. Quantitative national standards with respect to the above aspect are yet to be developed in Pakistan. However, guidance in qualitative terms can be obtained from the Pakistan Factories Rules, 1962 (based on the Factories Act, 1934) and the Labor Laws (Amended) Ordinance, 1972.

2.6 TOXIC AND HAZARDOUS WASTE

Section 14 of the PEPA Act, 1997 amended (2012) prohibits the handling trade collection and storage of hazardous substances. Hazardous substances rules have been formulated in this regard but they are still on the status of draft and available on the website of EPD and Pak EPA. Protection of the environment with regards to toxic and hazardous waste is also covered by the Pakistan Penal Code (PPC), 1860. Environment Protection Department (EPD), Punjab, is mandated to monitor the transportation of hazardous materials within the provincial limits.

2.7 PRESERVATION OF CULTURAL HERITAGE

The Antiquities Act, 1975, administered by the Provincial Government, is aimed at safeguarding the preservation of cultural heritage, destruction, damage or defacement of antiquities is an offence under the Act. No archaeological site lies in project area.

2.8 ADMINISTRATIVE FRAMEWORK

2.8.1 M/S Nisa-SF Private Limited

The implementing agency of the proposed project is Nisa-SF pvt. Ltd. who will execute the proposed Project at 10 km Muridke- Sheikhpura road, district SKP. The management of Nisa-SF pvt. Ltd. will ensure that all the proposed measures are effectively implemented at the design, construction and operational stages up to satisfaction of the act, rules and regulations.

2.8.2 Environmental Protection Agency, Punjab

Pakistan Environmental Protection Council is the apex inter-ministerial and multi-stakeholders decision-making body, which is headed by Prime Minister. While Pakistan Environmental Protection Agency is meant for the enforcement of environmental laws in Pakistan, they have delegated powers to provincial environmental protection agencies for review, approval and monitoring of environmental examination/ assessment projects. After 18th Amendment EPD has all powers to enforcement of PEPA 1997 amended 2012. As regards the proposed Project, EPA Punjab will be responsible for reviewing the report, issuing No Objection Certificate (NOC) and overall/broad based monitoring of the proposed Project activities.

Hazardous Substances Rules, 2003

These guidelines are developed to cope with the storage and disposal of hazardous substances. The proponent shall ensure to carry out EIA and list all the substances defined by the rules in the proper place. The basic instruction should be mentioned on the substances. The relevant portion of these guidelines will be followed.

Hospital Waste Management Rule, 2014

According to this rule all hospitals, clinics, laboratories, dispensaries, pharmacies, nursing homes, blood banks, autopsy centers, mortuaries, medical research institutes, and veterinary institutions

are to strictly follow hospital waste management rules of 2014 for the environmentally-safe disposal of infectious and hazardous waste. Pakistan Environmental Protection Act, 1997 and Hospital Waste Management Rules, 2014, strictly prohibit unsafe disposal of all types of hospital/hazardous waste including hospital waste. Every hospital public or private shall responsible for the proper management of the waste generated by it till its final disposal in accordance with provision of this act and rule. Waste management plan shall be prepared by waste management officer for the approval by the hospital waste management team and shall be based on internationally recognized environmental standards for safe collection, transportation, storage and its final disposal. Radioactive shall be stored separately clearly marking with radioactive sign on bags. The landfill shall be located at site with minimal risk of pollution of ground water and rivers. Every hospital shall follow reuse, recycle waste to avoid its maximum waste generation with provision of this act and rules.

2.9 Punjab Environmental Quality Standards for Treatment of Liquid and disposal of Bio medical waste 2016.

EPA Punjab established a set of guidelines for treatment of liquid and disposal of bio medical waste notified in the Punjab Gazette. The following notification number. SO(G) /EPD/7-26 /2013, dated 15-08-2016 regarding the Punjab environmental Quality standards for treatment of liquid and disposal of bio medical waste by incineration, autoclaving , Microwaving and deep burial.

- Air pollution control devices shall be installed or retrofitted with the incinerator to achieve the given standards.
- Chlorinated plastics shall not be incinerated and the waste incinerated shall also not be chemically treated with any chlorinated disinfectant.
- Only low Sulphur fuel such as light diesel oil, CNG or LPG shall be used as a fuel in the incinerator.
- Combustion gas analyzers shall be used to measure CO₂, CO and O₂
- A pit or trench shall be dug about 2 meter deep. It shall be half filled with waste and then covered with lime within 50 cm of lime before filling the rest of the pit wit soil.

2.10 Punjab Environmental quality standards (Motor Vehicles exhaust and noise) 2016

According to this rule a person shall not operate a motor vehicle from which air pollutants or noise are being emitted in an amount, concentration or level which is in excess of the Environmental quality standards or where applicable the standards established under clause (g) of subsection (1) of section 6 of the Act.

The authorized officer shall verify the compliance of the directions. The authorized officer may impound, with the help of local Police, the motor vehicle which is being operated in contravention of these rules after the days mentioned on the direction slip or even after the imposition of administrative penalty.

2.11 ENVIRONMENTAL GUIDELINES

Three sets of guidelines, the Pak-EPA's Environmental Guidelines, the World Bank Environmental Guidelines, and ADB Environmental Guidelines are reviewed here.

2.11.1 Environmental Protection Agency's Environmental Guidelines

The Federal EPA has prepared a set of guidelines for conducting environmental assessments. The guidelines derive from much of the existing work done by international donor agencies and NGOs. The package of regulations, of which the guidelines form a part, includes the PEPA 1997 amended 2012 and the PEQS. The guidelines themselves are listed below.

- Guidelines for the Preparation and Review of Environmental Reports,
- Guidelines for Public Consultation,
- Guidelines for Sensitive and Critical Areas,
- Sectoral Guidelines

It is stated in the Pakistan Environmental Protection Agency Review of IEE and EIA Regulations, 2000 that the EIA or IEE must be prepared to the extent practicable, in accordance with the Pakistan Environmental Protection Agency Environmental Guidelines.

1. World Bank Environmental Guidelines

The principal World Bank publications that contain environmental guidelines are listed below.

- Pollution Prevention and Abatement Handbook 1998: Towards Cleaner Production, (WB/UNIDO/UNEP, 1999)
- Environmental Assessment Sourcebook, Volume I: Policies, Procedures, and Cross-Sectoral Issues, (WB, 1991-a).

2.11.2 ADB Guidelines

The principle ADB guidelines relevant for this project are the Environmental Assessment Guidelines (ADB, 2003). The guidelines has two parts, the first providing an overview of the environmental assessment requirements and procedures, and the second, the technical guidelines. In addition, the guidelines include Rapid Environmental Assessment checklists for different sectors, and contents and formats for EIAs as well as IEEs.

Asian Development Bank also notified in 2006 performance and evaluation guidelines for public sector operations including hospitals which give a broad line guidance for a successful implementation a project like hospital.

CHAPTER-3

DESCRIPTION OF THE ENVIRONMENT

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3.1 INTRODUCTION

This chapter describes the baseline conditions, which cover the existing physical, ecological, and socio-economic environment of the Study Area. Information on these aspects has been derived from the desk study of available data, field visits to the project area as well as information obtained through visits to the Government departments and other agencies namely Irrigation Department, Meteorological Department, EPD, Forest offices and prevailing environmental laws and environmental quality standards etc.

3.2 DESK STUDIES

Proposed project design data was collected from Nisa-Sf Pvt. Ltd. This data included the available documents, drawings, reports, etc. related to the proposed pharmaceutical unit. The experts conducted a detailed desk study of the above available data before the field visit. Salient features of the Project were thoroughly reviewed to assess the environmental implications. Performa for social and economic baseline condition was designed for field survey.

The documents which were consulted and departments visited are Irrigation Department, Archaeology department, Meteorological Department, EPD, and other related officials and literature on internet.

3.3 SITE VISITS

A team of experts of “Sustainable Environmental Solutions” visited the proposed site of Pharmaceutical manufacturing unit and had discussion on the structure and process design flow of the project and options for disposal of the waste water.

The proposed project area is situated at 10 km main Muridke- Sheikhpura road and surrounded by industries and agriculture land use. Environmental data on physical, ecological and socioeconomic aspects were collected for carrying out environmental assessment. Secondary data were also collected from various sources mainly reports and literature. An introductory leaflet was prepared about the features of the proposed project among the people of the area. After some days,

social survey of the project area was carried out through a questionnaire under which people living around the proposed plant area were interviewed to have their views about the project installation and the perceived impacts on the natural environment around the proposed project. This included information on socioeconomic conditions, project information and its possible impacts. Photographs of the various environmental aspects both inside and outside the proposed project area were also taken and are given as Photo logs.

3.4 PHYSICAL ENVIRONMENT

3.4.1 Topography

The proposed project site comprises of 30 kanal 4 marla and 182 feet land which is situated in at main road 10 Km Muridke Sheikhupura road. The topography of the proposed Project Site is relatively flat as the area is located in plain terrain of Punjab. The existing site is surrounded by cultivated land and industries. Average elevation of the site is 205-216 m Above Mean Sea Level (AMSL).



P.P 3.1: Topography of the proposed site

3.4.2 Soils

The soil of the district Sheikhpura is of alluvial character of very recent origin formed by rivers and their changing courses and sand can be found a few feet below the surface. The course of the river Ravi within Sheikhpura area is winding and often subject to frequent alternations. In the rainy season, the currents are very strong. The geotechnical presence of the three distinct lithological units is revealed in this area. First one is Lean Clay (CL) present in a firm to stiff state up to a depth of 3.0 to 4.0 m below NSL. Second is Silty fine Sand (SM) and poorly graded Sand with Silt (SP-SM) present in medium dense to very dense state following the top layer and extending up to maximum investigation depth of 30 m. Third layer is Lean Clay/Sandy Lean Clay (CL) of thickness ranging from 1.0 to 9.0 m is present at depths ranges from 14.0 to 23.0 m. The groundwater table was observed at a depth 22 ft from existing ground level.

3.4.3 Seismology

Seismically, SKP lies in minor damage zone; distant earthquake can cause damage to structure with fundamental periods greater than 1.0 second, which corresponds to intensity V and VI of the M.M. scale. Earthquakes are generated due to tectonic processes in the upper part of the earth called lithosphere, which is divided into several rigid parts called “Plates”. Due to the movement of these plates, stress build up takes place and results in the deformation of the crustal mass in the form of folding and faulting. The energy produced due to movement along the faults is depicted in the form of earthquakes. The Project site is located north of the collision zone between the Indian and Eurasian plates. This contact represented by the Himalayas has always been generating moderate to large earthquakes including Kashmir (2005), Kangra(1905),Nepal-Bihar (1934) and Assam (1897 and 1950) that caused huge damage to life and property. Any major to large earthquake along Himalayan frontal faults can cause appreciable ground motion at site.

The Punjab Plain, in which the Project is located, also shows low to moderate level of seismicity which is associated with the faulting in the Basement rocks covered by the alluvial deposits. A minor to moderate earthquake originated from the Basement rocks in Punjab Plain could also

produce appreciable ground shaking due to thick alluvial deposits. The project site lies in Zone 2A where ground acceleration of $g/15$ to $g/20$ is expected.

According to Seismic Zoning Map of Pakistan included in the Pakistan Building Code Seismic Provisions (2007), Tehsil muridke falls in Zone 2A, therefore project structures should be designed in accordance with the requirement of seismic designing Zone 2A after giving due consideration to the foundation material about 0.08 to 0.15g.

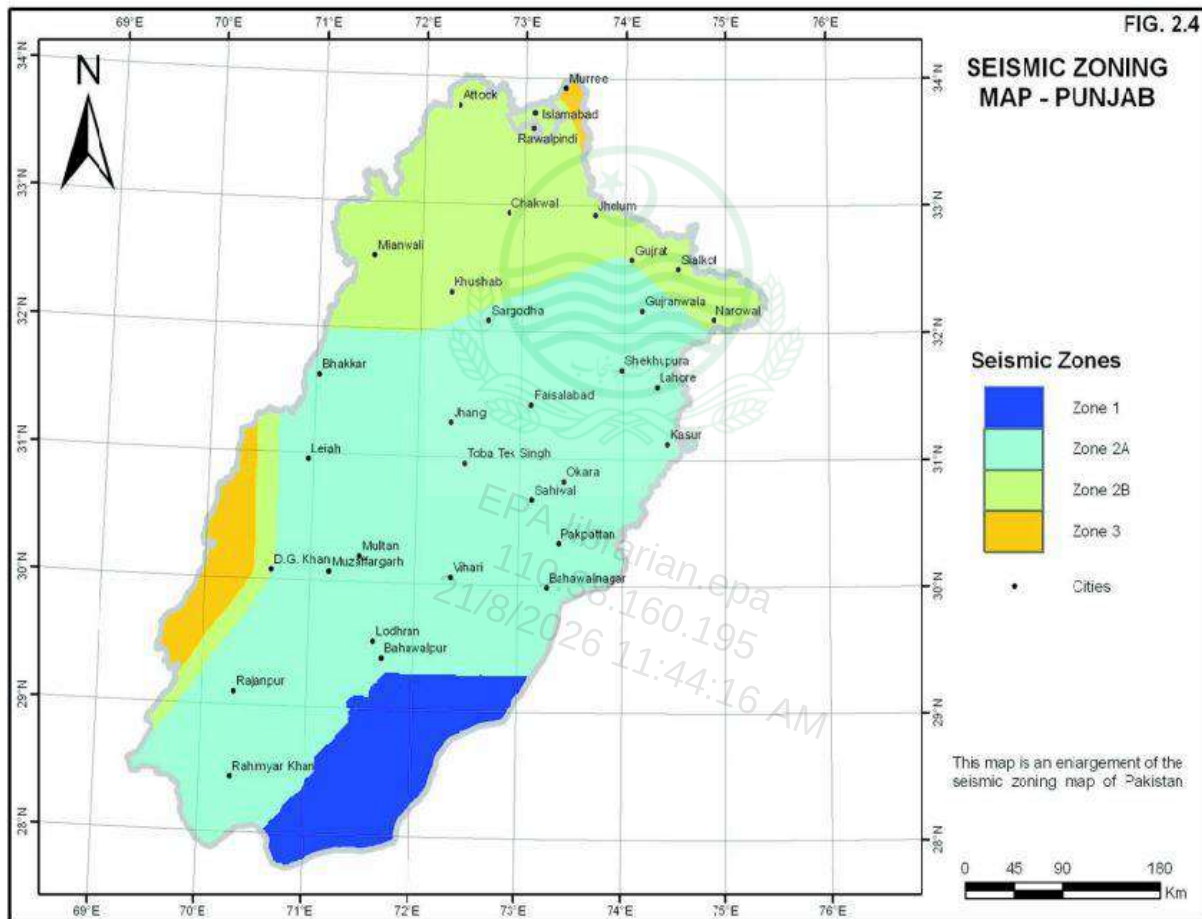
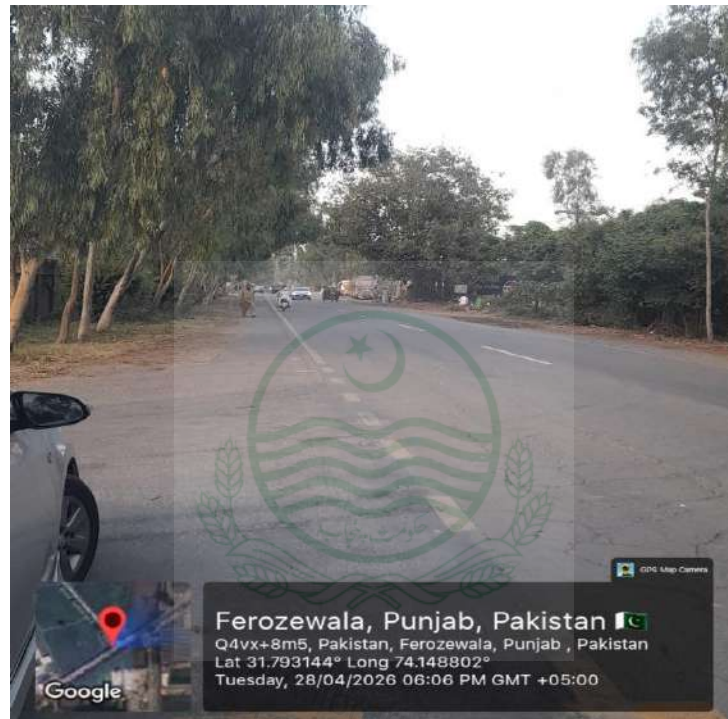


Exhibit 3.1: revised seismic Zones of Pakistan

3.4.4 Traffic

The project site is located on main Muridke-Sheikhupura road which is busy area with respect to traffic. The area is rural cum industrial in nature. About 150 vehicles per hour passes from access road which includes trolley tractor, car, motorcycle, Rickshaw and Mazda, bus, trucks, vans and rickshaws.



P.P 3.2: view of access road, Muridke- SKP road

3.4.5 Meteorology and Climatology

The project area lies in the plain lands of central Punjab. Summers are quite hot with moderate humidity, whilst winters are of extreme cold. Mean winter temperature (December/January) ranges between 12.8°C and 14.2°C. Mean summer temperature remains around 31.2 to 38°C with frequent spells crossing 40°C. The mean of the maximum temperature ranges between 36-40°C and mean of the minimum ranges from 15 to 20°C. Spring and autumn seasons are the most pleasant parts of the year and full of colorful activities. The season is divided into a dry period

called "rabi" extending from October to March and a wet one called "kharif" with substantial precipitation (approx. 50% of annual total) occurring in July and August. Long-term climate trend data was obtained from the MET office, located at the Jail road, in Lahore. The meteorological and climatic features of the project site are shown in **Table 3.1**

SKP has a hot humid climate with rainy, long and extremely hot summers, dry and cold winters, a monsoon and dust storms. The weather of SKP is extreme during the months of May, June and July, when the temperatures soar to 35–40 °C. From late June till August, the monsoon seasons starts, with heavy rainfall throughout the province. The highest average temperature recorded in summer is recorded in June that is 36 °C while the lowest was recorded in September that is 31°C. Recorded-breaking highest temperature of 45°C was recorded on 27 May 2010. The lowest temperature recorded in Lahore is 5.9 °C (42.6 °F) recorded in month of January. The heaviest rainfall for Lahore also occurred in summer on 8 August 2010 when 163 millimeters (6.45 inches) of rain was recorded in 24 hours while the wettest month of summer is July as the highest average monthly rainfall is 202 (7.957 inches) millimeters.

Table-3.1 Meteorological and Climatic features of the project site

Climatic features of the project area	
Classification of climate	Tropical (hot / humid)
Predominant wind direction	Northeast / South
Wind intensity	Weak to moderate
Average annual precipitation	> 628.2 mm
Rainy season	July to August
Dry season	October to June
Average annual temperature	19.8-30.8°C

Average summer temperature	31-40 °C
Average winter temperature	5.9-6.8 °C
Average winter temperature	5.9-6.8 °C

The Project Area has extreme climate: it has hot summer and cold winters. The summer starts from April and lasts till September. May, June, and July are the hottest months. The mean maximum and minimum temperature ranges from 40.4 °C and 27.3 °C respectively for these months. The winter seasons last from November to March. December, January and February are the coldest months. The mean maximum and mean minimum temperature ranges from 21.1°C to 4.2 °C in January. Few days earlier, temperature went down to 3 °C, ever minimum recorded in the history. Temperatures in the Project Area vary from 5 °C to 40 °C. The Project Area receives rains in all the seasons but monsoon rain is pronounced and constitutes a definite rainy season between the month of July and September. The average rainfall is about 628.2 millimeters per year. **Table-3.2** summarizes month-wise temperature, precipitation, and relative humidity. Based on climatic elements, five seasons are recognized in the Project Area:

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Month	Mean Temperature		Precipitation (mm)
	Maximum	Minimum	
January	19.8	5.9	23
February	22	8.9	28.6
March	27.1	14	41.2
April	33.9	19.6	19.7
May	38.6	23.7	22.4
June	40.4	27.4	36.3
July	36.1	26.9	202.4
August	35	26.4	163.9
September	35	24.4	61.1
October	32.9	18.3	12.4
November	27.4	11.6	4.2
December	21.6	6.8	13.9
Annual	30.8	17.8	628.2

Table 3.2:
Average Monthly Temperature and Precipitation
Source: Meteorology Department Lahore

3.4.5.1 Pre-monsoon Season

Pre-monsoon refers to the period from April to June prior to the setting of the monsoon. This is the hottest and the driest season, with persistent dry and hot winds. Day time temperature rises to 40. °C or even higher. The flows in the river begin to rise simultaneously due to melting of snow in the high mountains. The water table falls to the maximum depth.

3.4.5.2 Monsoon Season

The climate of the district is subject to extreme variations. From the middle of December to the middle of March, the air is very damp, cold and light to moderate

rain falls at intervals. The winter rain is followed by a spell of pleasant weather. In April, the temperature rises fast and the two successive months are very hot. Towards the end of June, Monsoon appears.

Monsoon is the main rainy period, which starts at the beginning of July, reaches its climax in August and gradually, subsides in September. High intensity Rainfall causes soil erosion which is a function of erosivity and erodibility. The cool monsoon winds followed by heavy showers lower the temperature to great extent. The part of rain percolates into the soil and is conserved in the subsoil and part adds to the groundwater. It is one of the major sources of ground water recharge. The conserved moisture in the soils is generally sufficient to rejuvenate the vegetation. All plants grow rapidly and mature towards the end of the season. With the start of monsoon season, the rivers flow at their peak level. The groundwater level is improved toward the end of the season in September and October.

3.4.5.3 Post-monsoon Season

Post monsoon season refers to autumn (October-November). The temperature starts falling but the extreme aridity prevents plants to flower early and set seed toward mid-seasons. Groundwater level rises as a result of infiltration from rainfall.

3.4.5.4 Winter Season

Winter refers to the period from December to January. Western Disturbance influence the winter season. The average lowest January temperature in the season of winter is 5.9 °C (42.6°F). While the average highest temperature in winter was recorded in the month of December which is of 21.6 °C (70.9 °F). Heavy rains occur in winter which decreases the temperature further. Hailstorms also occur due to Western Disturbance. The highest monthly rainfall in winter occurs in February that is 28.6 millimeters. The plants become dormant and most of them dry out. Most of the trees shed their leaves and few remain green or partly green. Sometimes this season becomes severe due to cold Siberian winds. Groundwater level declines in this season due to low flows in the rivers and no or little rains which usually fall in light showers causing little soil erosion.

3.4.5.5 Spring Season

Spring refers to the period from February to April, when temperatures become pleasant. The highest average temperature of 33.9 °C (93 °F) in spring season was recorded in April while the lowest is recorded in March that is 14 °C (57.2 °F). Rains are rare in the spring season. The highest average monthly rainfall was recorded in the month of March that is 41.2. Some light showers of rain may also fall without generating run off. The vegetation sprouts again because of conserved moisture from winter and spring rains, if any. The water table starts falling.

3.4.5.6 Rainfall

Towards end of June monsoon condition appears and during the following 2 and half months spell of season alternates with intervals of sultry weather. The winter rain falls during January, February and March ranging from 23 to 41.2 millimeters. Month wise mean precipitation recorded is given in **Table- 3.2**

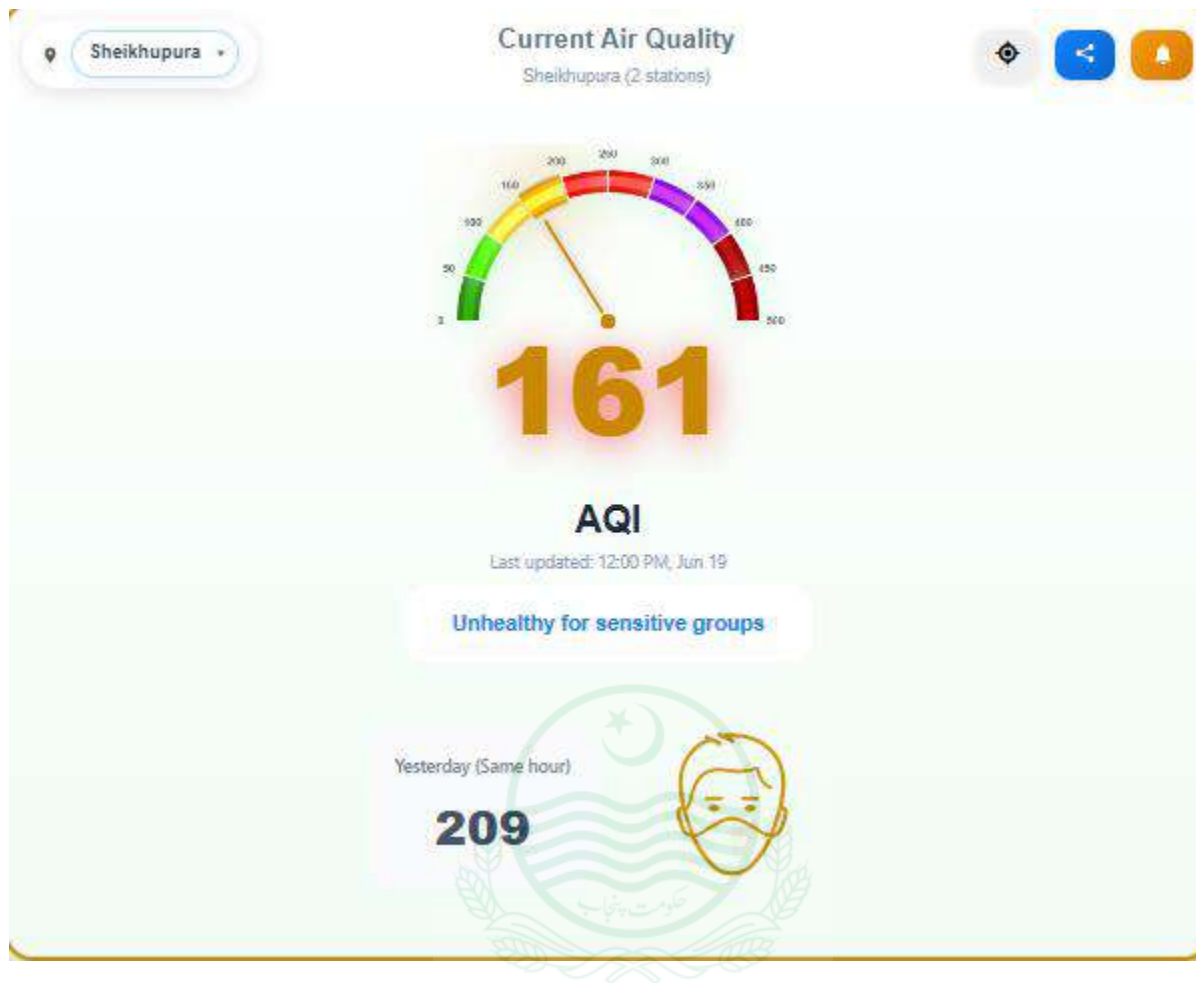
3.5 Noise and Air analysis:

The air quality of the project area is influenced by the industrial activity in the area and Line source of main Muridke- SKP road where hundreds of motor vehicles pass daily. Yet the air quality of the area is well within the PEQS limits. Noise from vehicles and other powered mechanical equipment is intermittent. There are no significant disturbances to the quiet rural setting. However, the construction from the proposed project will use mechanical equipment.

Pak Green Environmental Lab team has carried out noise level measurements at various locations within the premises. They analyzed Log equivalent values at site which were much below the PEQS limit prescribed by the EPA. Typical values were: average 63.6 dB A; high 67.0 dB A; and low 59.5 dB A. The noise level monitoring results are attached at **Annex-II**.



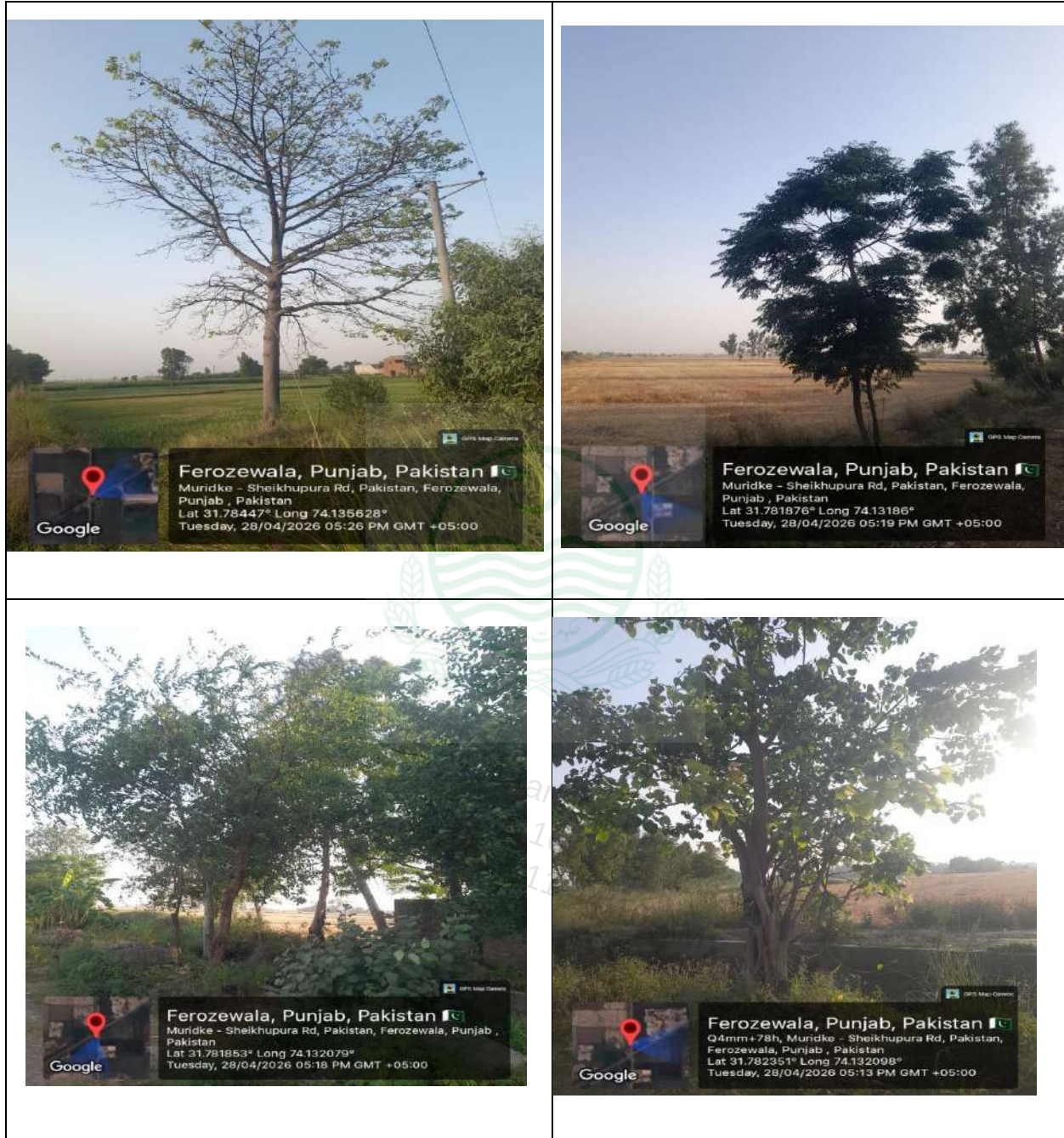
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3.6 Biological Environment:

Flora:

In Sheikhupura the flora is similar to rest of the irrigated tracts at central Punjab. In general, the vegetation found in this part of the arid region is sparse. Only plants with xerophytes adaptations such as deep roots, rod like thick or fleshy stems, leaves either absent or reduced are able to survive in this extremely dry climate. Distinctly scattered trees of stunted growth are found along the depressions technically known as desert scrub.





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Vegetation of the project area:

Sr. No.	Botanical Name	English Name	Local Name
1.	<i>Acacia nilotica</i>	Gum acacia	Baber
2.	<i>Albiaaiz procera</i>	Indian walnut	Achosirhan
3.	<i>Azadirachta indica</i>	Ash-leaved bead tree	Nim

4.	<i>Cassia fistula</i>	Pudding pipe tree	Amaltas
5.	<i>Conocarpus lancefoleus</i>	Ethiopian teak	Kono
6.	<i>Dalbergia sisso</i>	Shisham	Talee
7.	<i>Eucalyptus camaldulensis</i>	Red-gum	Sufada
8.	<i>Ficus bengalensis</i>	Ficus	Bur
9.	<i>Pithecellobium dulce</i>	Jangle pithecolobium	Jungle Jalebee
10.	<i>Salmaia malabarica</i>	Silk cotton tree	Simal
11.	<i>Sesbania aegyptica</i>	Egyptian sesbania	Manjathri
12.	<i>Terminalia arjuna</i>	Terminalia	Aarjan
13.	<i>Thespesia populnea</i>	Tulip tree	Pyrus peepal

Source: Punjab Forest Department (2010)

Fauna:

The unblemished geographical feature of vast arid land; provides an ideal opportunity for variety of wildlife. Other animals found are pig, wolf, jackal, fox, squirrel, rats.

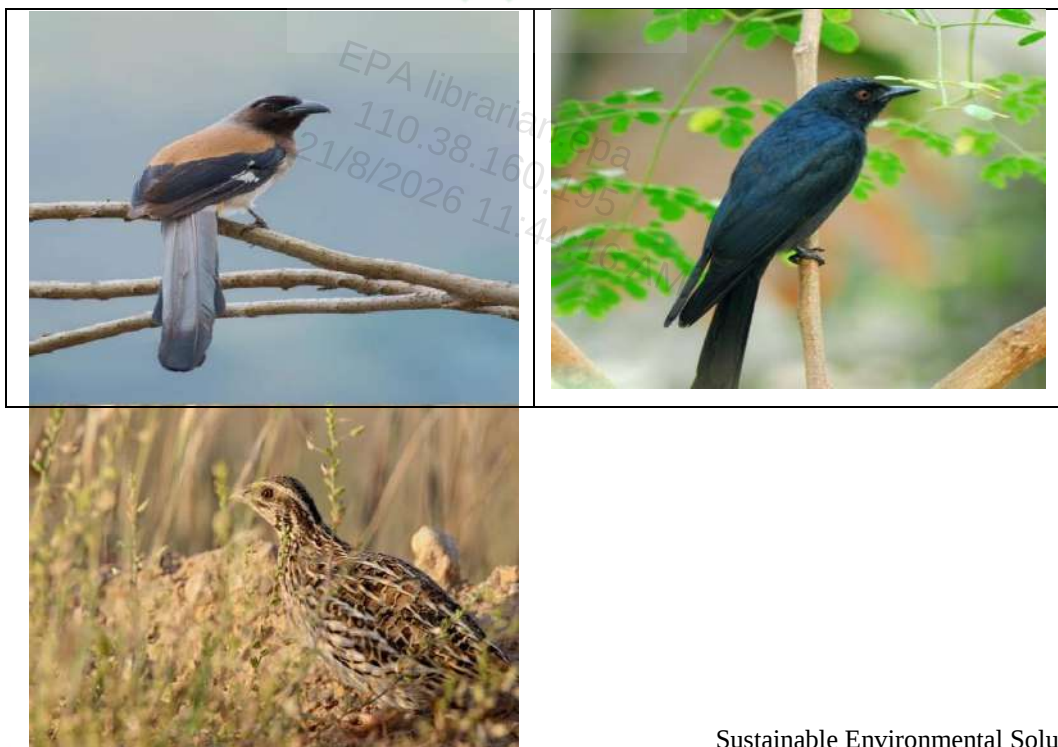
The area is very important of resident and migratory bird species. More than 100 species of have been recorded from the area. **Table.** lists the important birds of the study area:

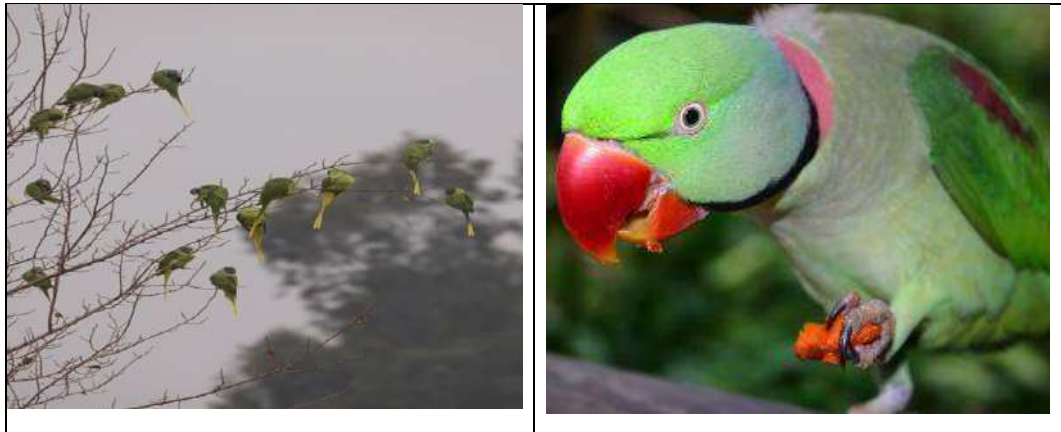
Important Birds of the Study area:

Sr. No.	English Name	Scientific Name	Local Name
1.	Great Bustard	<i>Ardeotis nigricps</i>	Barri Tiloor, Hukria
2.	Houbara/Macqueen's Bustard	<i>Chlamydotis macqueeni</i>	Tiloor, Houbaia
3.	Common/ Blue Peafowl	<i>Paro cristatus</i>	Neela More, Mor
4.	Black Francolin/ Partridge	<i>Francolinus</i>	Kala Titer, Karo Titar
5.	Grey Francolin/ Partridge	<i>Francolinus pondicerianus</i>	Bhura Titer, Achho Tittar

6.	Yellow Legged Green Pigeon	<i>Treron phoenicoptera</i>	Harrial Kabutar
7.	Red Turtle Dove	<i>Streptopelia tranquebarica</i>	Surkh Fakhta
8.	Dalmatian Pelican	<i>Pelecanus crispus</i>	Hawasal, pain Pakhhi
9.	Lesser Flamingo	<i>Phoenicopterus minor</i>	Lum Dheeng/Laakho Jani
10	Oriental Darter/Anhinga/Snake bird	<i>Anhinga melanogaster</i>	Jall Kawwa
1.1	White Stork	<i>Ciconia</i>	Safaid Laqlaq/Achhhi Toor
12.	Greater Painted Snipe	<i>Rostratula benghalensis</i>	Rangeen Isnif
13.	Sociable Lapwing	<i>Vanellus gregarius</i>	Tattihri, Sehkari teeto
14.	Pheasant tailed Jacana	<i>Hydrophasianus</i>	Peehoo, Peehoorri

Source: Punjab Wildlife Department (2010).





Important Birds in this area

3.7 Agricultural habitats:

Most parts of the study area are under very intensive irrigated cultivation. In addition, livestock rearing is also practiced extensively, and milk animals are common. The use of the chemical fertilizers and pesticides is very common. Several species of wildlife have adapted to the changed habitat. These include: Jackal; Jungle Cat, Bengal Fox, Small Indian Mongoose, Shrew, Rodent pests including Porcupine, Fruit Bats and Wild Boar. The avifauna which survived the modified habitat include Doves, Black Partridge, Cuckoos, Koel, Woodpeckers, Parakeets, Bulbuls, Babblers, Black Drongo, Bee-eaters, Finches and House Sparrow. The reptilian species of this modified habitat include Krait, Cobra, Saw-scaled Viper, Rat Snake and Monitor Lizard. In these modified habitats, the winter bird species from Himalayas have reduced due to the extensive use of pesticides in these areas, since these species feed on the insects. These birds play an important role in controlling insects particularly in the forests. Almost all of the project interventions will be undertaken in this habitat type. (Agriculture Department Government of Punjab (2011) (Environmental and Social Assessment Report of Punjab Irrigated-Agriculture Productivity Improvement Project.)

During both the seasons i.e. kharif and winter variety of crops are grown in the study area. The crops grown are wheat, cotton, maize, rice, sugarcane, sorghum, sunflower, rapeseed, ground nut, guwar, variety of vegetables and other food, fodder, oilseed, and other crops.

Among fruit crops the pre-dominant species are mango, variety of citrus and several other fruits.

Forests and vegetations:

The forest resources of the study area included riverine bela forests, irrigated plantations, linear plantations and range lands. The Riverine forests are located along the rivers within the embankments and are managed by the Punjab Forest Department. Irrigated plantations are located within the irrigated zone and get water from irrigation network. Linear plantations are the trees planted along the irrigation network, roads, railway strips and rangelands are located in the rain-fed areas of the study area. On farmlands lot of trees of different varieties were found grown in the study area. Mango and Citrus gardens on the farmlands were very common in almost all tehsils of Kasur district but except in the pockets where the quality of lands was either waterlogged or soils were saline.

Major trees grown in all types of forest resources are Shisham, Eucalyptus, Simal, Babul and other species.

The types of forests are as under:

- Tropical Thorn Forests Indus Floodplains
- Tropical Thorn Forests (Sandy)
- Irrigated Forest Plantations on farmlands and Tropical Thorn Forests
- Rivers, Wetlands, and Waterlogged Areas throughout the study area
- Farmlands/Agricultural Areas Throughout the study area
- Smart Forest and Guzara forest are about 20 Km from the site.

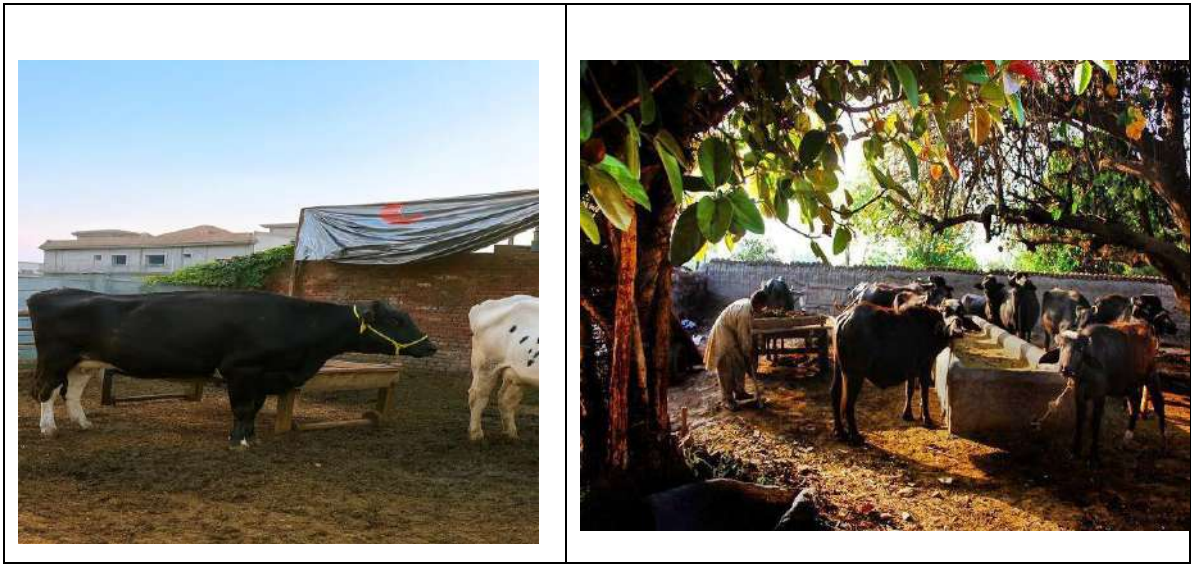
Sheikhpura District in Pakistan features significant forest areas, notably the pioneering **Rakh Jhok Forest**, Punjab's first "Smart Forest," located near the Ravi River and planned for massive afforestation. Key forest and green spaces also include the historic **Hiran Minar** complex, serving as a recreational spot with eco-tourism initiatives, and various nurseries and linear plantations along highways and canals managed by different departments like forest and wild life.

The **Shahdara Reserve Forest** is a significant forest area located near the border of the Lahore and Sheikhupura districts in Pakistan. While it is often associated with Lahore (its address is in Lahore, and it falls under the Lahore Forest Division), its proximity means it is a major forest for the Sheikhupura region.

3.8 Livestock:

After agriculture the second important source of economy is the livestock. Almost all households are involved in livestock rearing on their agriculture farms and in houses. The main species of livestock are Buffalo, Cow, Bullock, Goat, Sheep, Camel, donkey and other animals. Poultry farming is another source of earning of the people of the study area. People use this resource for variety of uses such as milk, meat, hides, cultivation, draught, and several other uses.





Livestock in this area

Wildlife:

The existing natural habitat of the province is largely modified habitat owing to human interventions. Construction of an extensive irrigation network during early 20th century paved the way for transformation of the tropical thorn forest into agricultural lands. This has led to changed landscape and loss of wildlife. Nine habitat types have been identified in the province, of which, deserts, sub-tropical deciduous and wetlands are of concern with regard to threat to wildlife. The major habitats along with their geographical areas have been discussed in this report.

The areas located in the Sheikhpura districts are semi -arid areas. Agricultural and irrigated is the main habitat type in the area which is an important hotspot where the natural, bio- physical and social environment and natural resources are different from the irrigated areas of the package area and rest of the irrigated areas. The wild life has been restricted in fields like sugarcane and riverine banks of river and canals. Some of the wild life jackal, fox, carpenpine, hedgehog, snakes, lizards, mangoos, squirrel.

Environmental\Biological hotspots:

The environmental hotspots in the study area are essentially the wildlife protected sites, flora, fauna vegetation, rangelands and others. They are considered as biodiversity hotspots due to the availability of diverse habitats and relatively low anthropological disturbance.



List of Mammals in Study Area:

Sr. No.	English Name	Scientific Name	Local Name
1.	Ibex / Persian Wild Goat	<i>Capra aegagrus Blythi</i>	Sarah, Pahari Bakra
2.	Afghan Urial / Asian Wild Sheep	<i>Ovis vignei blanfordi</i>	Gad, Pahari Dumba
3.	Indian Desert Gazelle / Chinkara	<i>Gazella bennettii</i>	Chinkara, Hiran
4.	Black Buck / Indian Savana Antelope	<i>Antelope cervicapra</i>	Kala Hiran
6.	Blue Bull / Nilgai	<i>Boselaphus Tragocamelus</i>	Neel Gai, Rojh
7.	Indian Wild Ass / Gorkhar / Onagar	<i>Equus hemionus</i>	Khur Jungli Gadha, GorkharKhuchhar
8.	Striped Hyaena		Hyaena
9.	Indian Desert Wolf	<i>Cains lupus pallipus</i>	Bherria, Bagharr
10.	Indian Desert Fox	<i>Vulpes vulpes Pusillus</i>	Lomrri, Lomarr
11.	Caracal / Red Lynx	<i>Felis caracal</i>	Siah Gosh, Harola
12.	Jungle Cat / Swamp Cat	<i>Felis chaus</i>	Jungli Billi
14.	Small Indian Civet	<i>Viverricula indica</i>	Mushk Billi, Rasse

15.	Honey Badger / Ratel	<i>Mellivora capensis</i>	Bijju, Gor Pat
16.	Scaly Anteater / Pangolin	<i>Manis crassicaudata</i>	Chiunti Khor, Chhalerano
18.	Smooth Coated Otter	<i>Lutrogale Perspicillata</i>	Udh Bilao, Luddharr
19.	Flying Fox / Fulvous Fruit Bat	<i>Rousettus leschenaultia</i>	Urta Lomrri, Meva Khore Chimgadar
21.	Mouse-like Hamster	<i>Calomyscus hotsoni</i> <i>Hamster</i>	Choocha

Source: Punjab Wildlife Department, 2010

Buffalo, goat, sheep, camel, donkey, bull, horse, hen, peacock, deer, dog and cat are the common animals reared as domestic and livestock animals which are source of income for the people of the area.

Table 4.8: Important Reptiles and Amphibians of Punjab

Sr. No.	English Name	Scientific Name	Local Name
1.	Indian Ocean Green Turtle	<i>Chelonia mydas</i>	Samundri Subz Katchhwa
2.	Pacific Olive Ridley Turtle	<i>Lepidochelys olivacea</i>	Sumundri Zaituni Katchhwa
3.	Spotted Pond Turtle	<i>Geoclemys hamiltoni</i>	Talabi Katchhwa
4.	Indian saw back River Turtle	<i>Kachuga tecta</i>	Daryai Katchhwa
5.	Starred Tortoise	<i>Geochelone elegans</i>	Sitara Katchhwa
6.	Marsh/Stub-Nosed Crocodile	<i>Crocodylus palustris</i>	Magar Much, Mugger, Wagu
7.	Yellow/Striped Monitor – Lizard	<i>Varanus flavescens</i>	Goh, Dhari Dar Goh

8.	Fat-Tailed/Leopard Gecko	<i>Eubleparis macularius</i>	Hann Khann, Cheetah
			Chhupkali
9.	Banded Dwarf Gecko	<i>Tropicolotes helenae</i>	Dhari Dar Chhoti Chhupkali
10.	Sindh Broad Tailed	<i>Gecko teratolepis</i>	Sindh Moti Dum
		<i>Fasciata</i>	Chhupkali
11.	Orange Tailed Sand Skink	<i>Eumeces schneideri</i>	Narangi Dum Regmahi, Makh Chatti
12.	Indian Sand Swimmer	<i>Ophiomorus</i>	Regmahi, Makh Chatti
		<i>Tridactylus</i>	
13.	Indian Spiny Tailed Lizard	<i>Uromastix hardwicki</i>	Sandha, Sandho
14.	Indian Chameleon	<i>Chamaeleo zeylanicus</i>	Rung Badal Girgit
15.	Indian Rock Python	<i>Molurus</i>	Azdaha, Arrarh Blah
16.	Russelle Sand Boa	<i>Eryx conicus</i>	Russelle Ki Do Muhi
17.	Oxus/Black Cobra	<i>Naja oxiana</i>	Kala Naag, Cobra
18.	Indian Common Krait	<i>Bungarus caeruleus</i>	Sang Choor, Peeun Blah
19.	Russelle's Viper	<i>Vipera russelii</i>	Ghorriala, Dumbhar Blah
20.	Red Spotted Diadem Snake	<i>Sphalerosolis</i>	Shahi Naag, Korarr
		<i>Arenarius</i>	
21.	Pakistan Ribbon/Sand Snake	<i>Psammophis leithi</i>	Regis Amp, Shehgi
22.	Glossy Bellied Racer	<i>Coluber</i>	Paharri Samp, Par Blah
		<i>Ventromaculatus</i>	
23.	Common Rat	<i>Ptyas mucosus</i>	Dhamman, Kua Mar
	Snake/Dhaman		
24.	Sindh River Snake	<i>Enhydris pakistanicus</i>	Daryai Samp

25.	Beaked Sea Snake	<i>Enhydrina schistosus</i>	Chonch Dar Samundari Samp
26.	Annulated Sea Snake	<i>Hydrophis cyanocinctus</i>	Dhari Dar, Samundari Samp
27.	Slender Blind Snake	<i>Typhlops porrects</i>	Andha Samp, Sampolia
28.	Tiger Bull Frog	<i>Rana tigerina</i>	Maindak Dedhar
29.	Indus Toad	<i>Bafo andersori</i>	Khushki Ka Maindak

3.9 Socioeconomic Environment of the area:

Population and demographic features of study area:

Demographic Features of study areas as per the demographic indicators of the Tehsils are presented below.

As of 2023 consensus Sheikhupura district has 593,260 households and a population of 4,049,418. The district has a sex ratio of 105.58 males to 100 females and a literacy rate of 68.88%: 72.09% for males and 65.46% for females. 1,087,191 (26.85% of the surveyed population) are under 10 years of age. 1,550,793 (38.30%) live in urban areas.

Poverty:

Due to small land holdings and self-cultivation is majority of areas of the project, the people are well to do due to earnings from agriculture. The quality of most lands is good where variety of agriculture in the form of crops and orchards are practiced. There are small to medium industries in the project area and also there are sugar mills and other industries providing sources of earnings. The farmers also grow variety of fruit trees on their lands. Farmers are also very hard working in every aspect of earnings. All these factors described above are indicators of rate of poverty. It was revealed during the stakeholder consultations and discussions with the communities that people living below the poverty line range between 20-30%. This is a better indicator compared to some parts of Punjab and the most

parts of the country. *(Estimates given by stakeholders during consultations).*

Infrastructure and social services:

The study areas are well connected through road, rail and other infrastructure. There are motorways, highways, provincial and district roads, village roads and farm to market roads. The consultants did not observe any difficulty with respect to road infrastructure, their quality and connectivity. Like-wise when asked direct questions about also did not express any difficulty in infrastructure and social services. This was also felt by the EIA team also. When asked direct questions about also infrastructure and social services the villagers did not express any difficulty in infrastructure and social services.

Education:

Education is an important aspect of social service. During travelling and communicating with the communities during stakeholder consultations, visiting the private and government educational institutions (primary and secondary schools) and observing while passing it was seen that the level, quality of education and cleanliness was above average than other parts of the country.

When asking direct questions about education the stakeholders were satisfied with education system and opportunities for educational institutions and overall quality of education in the study area.



Government associate college, high school Foundation school in project area.



Health:

There are adequate health facilities in the study area right from tehsils headquarters to villages. The communities did not have any complain on this social aspect. This was also observed during the community consultations.



Livelihood sources:

Agriculture and livestock are the dominant sources of livelihood for the people. People also have many opportunities of earnings from labor work in industries other works, shop keeping, road and building construction etc. etc. The people also did not have any complain on the un-employment aspect in government and private agencies. Majority of land holdings are small to medium resulting in self-sufficiency in earning their livelihood. Some

big landlords located in the study area were having large landholdings.

Quality of life values:

Quality of life values of the areas are good enough. The area is basically agriculture in nature which is changing rapidly into industrial one which is providing more job opportunities for the locals to improve their life style. Good educational institutes and adequate health facilities are available in the area. General Trunk (GT) Road passing by the area which helps people connecting with Lahore , Islamabad and Karachi and to transport their goods to the market to earn handsome money. Industrial hub in Muridke also helps to boost the economy of the people. It is the worlds best rice growing area.

The quality-of-life value of the project area will be improved by implementation of the project through following ways:

By providing job opportunities at local level which will enable the people to invest on education and health. The enhancement in income will make people able to use their income to use to improve their quality of life.

3.10 Cultural Heritage in Study Area:

This chapter of report provides the baseline of important archeological and heritage sites. A large number of sites exist in the province having archeological, historical, cultural, and religious significance, and the ones that have been officially notified and protected under the Antiquity Act, 1975. The data/information has been collected from primary and secondary data sources and surveys in the study area conducted prior to preparation of this report.

Sheikhpura has a rich cultural heritage that includes forts, tombs, and other historic sites.

Sheikhpura Fort: Built in 1607 during the reign of Emperor Jahangir, this fort was altered during the Sikh era. The fort was later given to Maharani Datar Kaur, the wife of Maharaja Ranjit Singh, who lived there until her death.

- **Mughal emperor Jahangir's fort:** Located in the Centre of the town, this fort was completed in 1619.

	
Tomb waris shah	Hiran minar

- **Hiran Minar Tomb:** A popular attraction in Sheikhupura, the Hiran Minar is a massive tower that overlooks the countryside.

Other historic sites

- **Sangla hill:** An important town in the Sheikhupura District, Sangla hill is said to be the site where the founder of Sikhism, Gurunanak, preached and helped the needy.
- **Jamia Masjid Muhajarin:** A popular attraction in Sheikhupura.
- **Ali Masjid:** A popular attraction in Sheikhupura.

Sensitive Habitat:

No sensitive habitat has been seen or reported by any authority in or around the proposed site.

3.11 WATER RESOURCES:

Rivers

The project area located near river Ravi. It is located 20 Km away from the river flows in the west of Lahore, which act as the major recharge source of the subsoil water. Ground water is used as source of water for domestic and agriculture purpose. Therefore, there is no usage of river water in this project.

Canals

The important canal is UCC canal which transfers water from river Chenab to river Ravi. The project area is irrigated through this canal distribution system. No water will be drawn from canal for proposed project.



Drains

Chhoti drain passes from this site. It comes from India and collects waste water of all urban centers and industries of Tehsil Kamoki and Muridka. It passes by the project site.



Groundwater

The water requirement during operation phase of the project will be minimum. Water will be used for syrup manufacturing and washing purpose. Which will be drawn from sub soil. The project area is underlain by unconsolidated alluvial deposits laid by river Ravi . Fine to medium sands from aquifer material and fine sediments (clay, silt) occur as discontinuous layers/lenses. The aquifer is fairly thick and may be considered continuous on regional basis. Groundwater table generally occurs at the site from 10-20meter below the existing surface. Keeping in view the general hydro-geological set up of the regional aquifer



Sampling of existing underground water in the area.

The quality of ground water is good and is being used in the irrigation. Pakistan Council of Research on Water Resources (PCRWR) ministry of Science, Islamabad conducted survey of the drinking water in district Lahore .The report shows 260 water samples from 20% villages of all the union councils were collected and analyzed. The analytical data demonstrated that 34% water

samples were contaminated with Total Coliforms, 5% with Nitrate (NO₃), 7% with Arsenic and 37% samples had high level of TDS when compared with PSQCA water quality standards. Overall analytical results picture showed that 69% water samples were found unsafe and only 31% samples were evaluated as safe for drinking purpose in rural areas of district Lahore.

There is one motor pump operating in the proposed site at the depth of 170 feet. Sample of the bore hole was collected and got analyzed from environment certified lab Pak Green Lab. The analysis showed that the water is of good quality. The chemical analysis of the groundwater is given in **Table 3.5 and attached at Annex- VI**.

3.12 Noise Levels

The major source of noise at the project Site is the vehicular traffic on the highway leading Sheikhpura from Muridka. The log equivalent of noise in the center of site was measured 54.8 dB (A). The noise at access road was measured 60.4 dB (A). When any motor vehicle presses horn the noise level goes up to 65 dB(A) which is not routine at this sight. Results of noise level monitoring data at the project site are presented in (**Annex- VII**).

3.13 Air Quality

The project area is agricultural and industrial in nature with thinly centered population in shape of villages. Air quality contaminating stationary source were observed near the site i.e. Kansai paints, Abdullah flour mill and Sunder Industrial state. There are three Pharmaceutical units, which are present 1 km away from site and have no impact on the site. The motor vehicles which pass from here are cars, motorcycle, truck, tractor, Qinch, and loader vans. The quality monitored at site shows the levels of SO₂, NO₂ and CO within ambient air quality standards. No significant impact of line source has been measured and site comes under the category of clean as prescribed criteria in NEQS of SRO 2000. Table-3.8 describes the average ambient air quality in the project area. The results of environmental laboratory at attached at **Annex- VIII Air quality parameters**.



CHAPTER- 4

PROJECT DESCRIPTION

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4.1 PROJECT DESCRIPTION

The demand for Pharmaceuticals is fueled by a high population growth rate (2.00%), rising life expectancy and consequent rise in older age group. At the same time, Pakistan has >50% of its population that lies below the age of 19 years. Infant mortality is high, at 74.4 per 1000 live births, as is maternal mortality. These factors along with increasing urbanization, increasing number of doctors and private investment in new hospitals and clinics will keep Pakistan a growing market for Pharmaceutical products. The average growth rate of this market has been an impressive 13% over the last 3 years. To fulfill these requirements Nisa-SF is making pharmaceutical products like syringes and IV sets. It will minimize the burden of pharmaceutical products import in the country while saving. It is a healthcare project.

4.2 Components of proposed project:

The proposed project involves the production of basically two different products categories which are explained below:

1. IV sets

There are further subcategories for these products which are also given in the following lines

2. Syringes:

BM 1ml Insulin 100 Units

BM AD Syringes

BM D/A Syringes

The proposed project involves the establishment of a modern manufacturing facility for the production of sterile, single-use disposable syringes intended for medical and healthcare applications. These syringes will be widely used in hospitals, clinics, laboratories, and vaccination programs. The project aims to ensure high standards of quality, safety, and hygiene in accordance with international guidelines such as ISO 13485 and Good Manufacturing Practices (GMP).

The manufacturing process begins with the procurement and preparation of medical-grade raw materials, including polypropylene for syringe components, stainless steel for needles, rubber for gaskets, and appropriate packaging materials. These materials are inspected and stored under controlled conditions to maintain their quality.

The core production process involves injection molding, where polypropylene granules are melted and injected into precision molds to form the syringe barrel, plunger, and needle hub. After molding, the components are cooled and ejected automatically, followed by a thorough inspection to identify any defects such as cracks, deformities, or incomplete shapes.

Parallel to this, needles are imported. These needles are then assembled with the hub to ensure a secure and leak-proof connection.

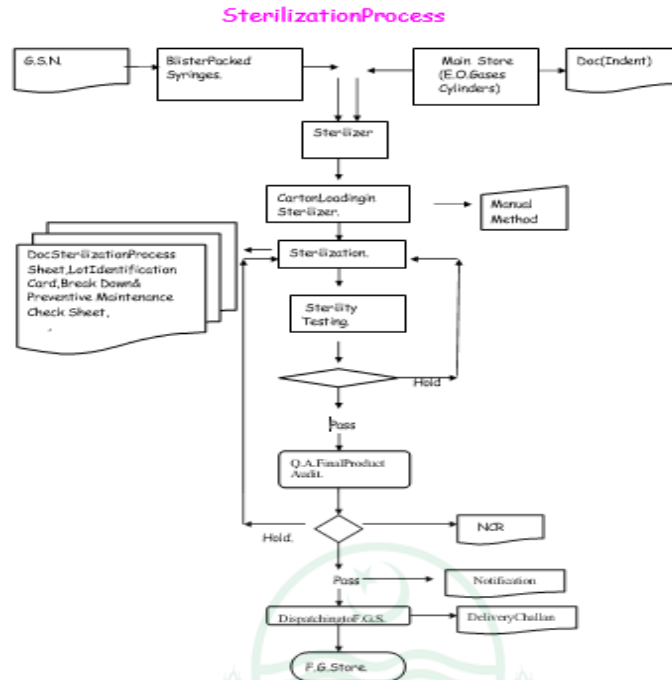
Subsequently, the inner surface of the syringe barrel undergoes siliconization, where a thin layer of medical-grade silicone oil is applied to ensure smooth movement of the plunger during use. The barrels are then printed with accurate graduation markings to indicate dosage measurements.

In the assembly stage, all components—including the barrel, plunger, gasket, and needle—are combined under controlled conditions. The assembled syringes are then sterilized using methods such as Ethylene Oxide (ETO) gas or gamma radiation to ensure complete elimination of microorganisms.

Following sterilization, each syringe undergoes rigorous quality control tests, including leakage tests, dimensional accuracy checks, and sterility verification, to ensure compliance with required standards.

Finally, the syringes are individually packed in sterile conditions (blister or pouch packaging), labeled with necessary product information, and packed into cartons for storage and distribution. The finished products are stored in clean, dry warehouses and dispatched to the market as per demand.

This project emphasizes not only product quality and patient safety but also environmental responsibility by managing waste, controlling emissions, and ensuring efficient use of resources



throughout the manufacturing process.

1. IV Sets:

The production of intravenous (IV) sets is a highly specialized and controlled industrial process that plays a vital role in modern healthcare systems. IV sets are essential medical devices used for the administration of fluids, medications, and nutrients directly into a patient's bloodstream. Due to their critical function, the manufacturing of IV sets must adhere to strict quality, safety, and hygiene standards, including international guidelines such as ISO 13485 and Good Manufacturing Practices (GMP). The entire process is carefully designed to ensure sterility, precision, and reliability of the final product.

The manufacturing process begins with the procurement and preparation of raw materials. Medical-grade materials such as polyvinyl chloride (PVC) for tubing, polypropylene for various components, stainless steel for needles, and rubber or elastomeric materials for seals are sourced from approved suppliers. These materials are thoroughly inspected upon arrival to ensure they

meet required quality standards. Proper storage conditions, including controlled temperature and cleanliness, are maintained to prevent contamination or degradation.

One of the most critical stages in IV set production is the extrusion of tubing. In this process, PVC granules are melted and passed through an extrusion machine to form flexible and transparent tubing. The tubing is then cooled, calibrated, and cut into specific lengths according to product specifications. This tubing must exhibit properties such as flexibility, strength, and chemical compatibility with medical fluids to ensure safe use.

Simultaneously, other components of the IV set—such as the spike, drip chamber, roller clamp, connectors, and injection ports—are manufactured using injection molding technology. In this process, molten plastic is injected into precision molds to produce components with consistent dimensions and high accuracy. After molding, these components are cooled, ejected, and subjected to inspection to identify any defects such as cracks or deformities.

Following the production of individual components, a rigorous inspection and cleaning process is carried out. Each part is examined visually and mechanically to ensure it meets quality standards. Cleaning processes, including air blowing or washing, are employed to remove dust and contaminants before assembly.

The assembly stage is conducted in cleanroom environments to maintain sterility and prevent contamination. During this stage, the different components are systematically connected. The spike is attached to the drip chamber, the tubing is connected to various components, and flow-regulating devices such as roller clamps are installed. Additional features, such as Y-connectors or injection ports, may also be incorporated depending on the product design. The final assembly includes attaching a needle or luer lock at the end of the tubing.

Once assembled, the IV sets undergo leak testing and functional testing. Leak tests ensure that there are no fluid losses during usage, while functional tests verify that the flow rate is properly controlled and that all connections are secure. These tests are crucial for ensuring the safety and effectiveness of the product.

Sterilization is a critical step in the production process. The assembled IV sets are sterilized using methods such as Ethylene Oxide (ETO) gas or gamma radiation. This process ensures the complete elimination of microorganisms, making the product safe for medical use. Sterilization is conducted under controlled conditions and validated to meet regulatory requirements.

After sterilization, the products undergo final quality control checks. These include visual inspection, sterility testing, and mechanical performance evaluation. Only those products that meet all specified criteria are approved for packaging.

The packaging process is carried out in sterile environments to maintain product integrity. Each IV set is individually packed in sealed pouches made of medical-grade materials. These packages are designed to protect the product from contamination and physical damage. Proper labeling is applied, including information such as batch number, manufacturing and expiry dates, sterilization method, and usage instructions. The packaged units are then grouped into cartons for storage and distribution.

Finally, the finished products are stored in clean and controlled warehouse conditions before being dispatched to healthcare facilities. Efficient logistics and inventory systems are used to ensure timely delivery and traceability of products.

In addition to production activities, environmental and safety considerations are also integral to the manufacturing process. Proper waste management systems are implemented to handle plastic waste and other by-products. Emissions from sterilization processes, particularly ETO gas, are carefully controlled to minimize environmental impact. Worker safety is also ensured through proper training, use of protective equipment, and adherence to safety protocols.

In conclusion, the production of IV sets is a complex and meticulously controlled process that requires advanced technology, strict quality assurance, and adherence to regulatory standards. Each stage of the process, from raw material selection to final packaging, is designed to ensure that the product is safe, sterile, and reliable for medical use. This makes IV set manufacturing a critical component of the healthcare supply chain, contributing significantly to patient care and treatment outcomes.

The detail about the IV products being made in our facility is is given below:

BM D/A IV Set NS-002

BM D/A IV Set NS-022

BM D/A Hypodermic Needles

BM D/A Scalp Vein Set

BM D/A Blood Transfusion Set

BM D/A Suction Tube

BM D/A Dialysis Tube

BM D/A AV Fistula Needle

ANGIOWAY D/A Pressure Monitoring Line

BM D/A IV Burette

HP D/A 3-Way Stopcock

DOSIFLOW PLUS D/A Flow Regulator Extension Line

Super Stopper HP D/A 3-Way Stopcock with Extension Tube

BM D/A Nelaton Catheter

BM D/a Suction Catheter

BM D/A Umbilical Cord Clamp

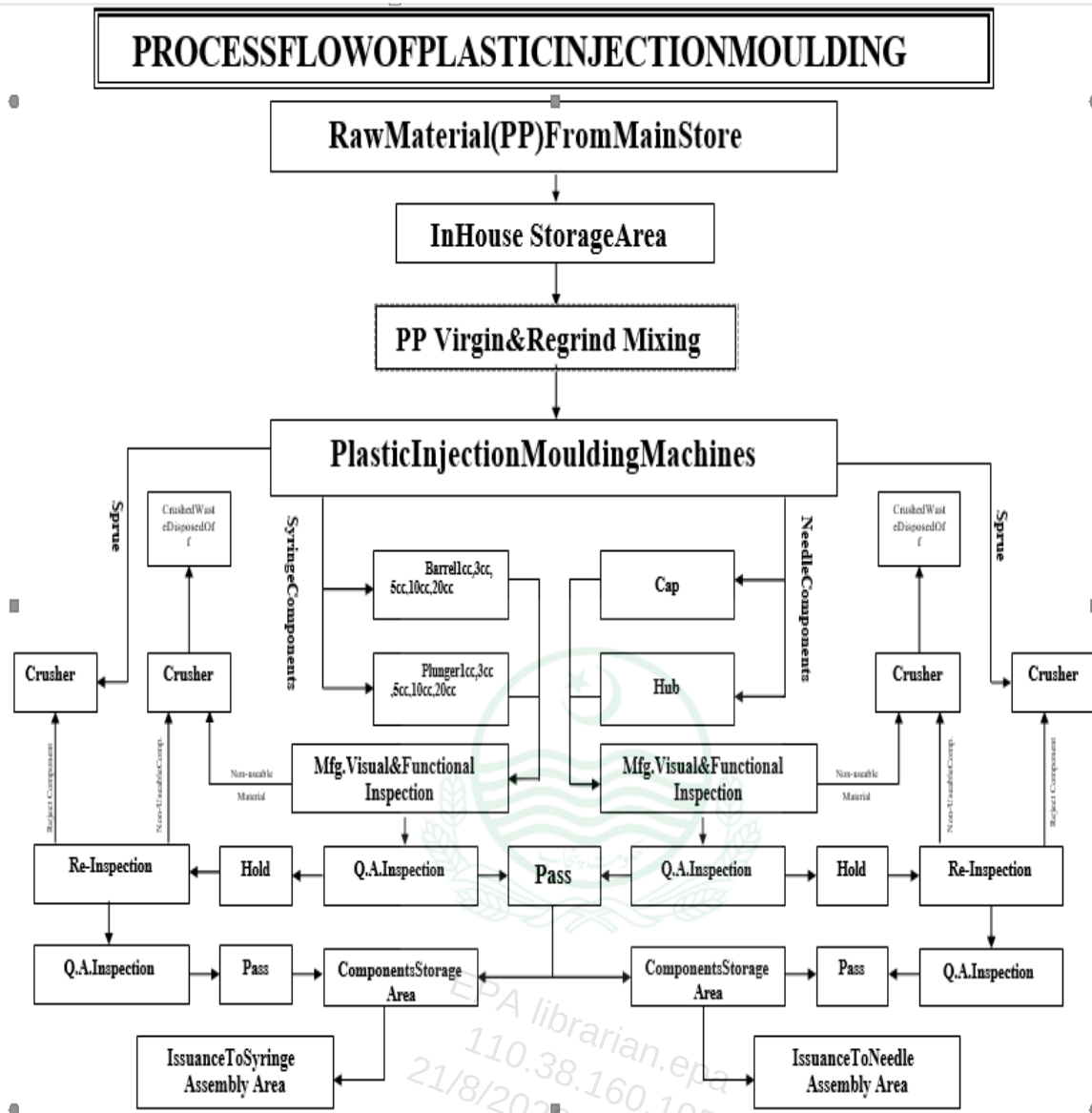
BM D/A Feeding Tube

BM D/A IV Catheter

BM Disposable Nasal Oxygen Tube

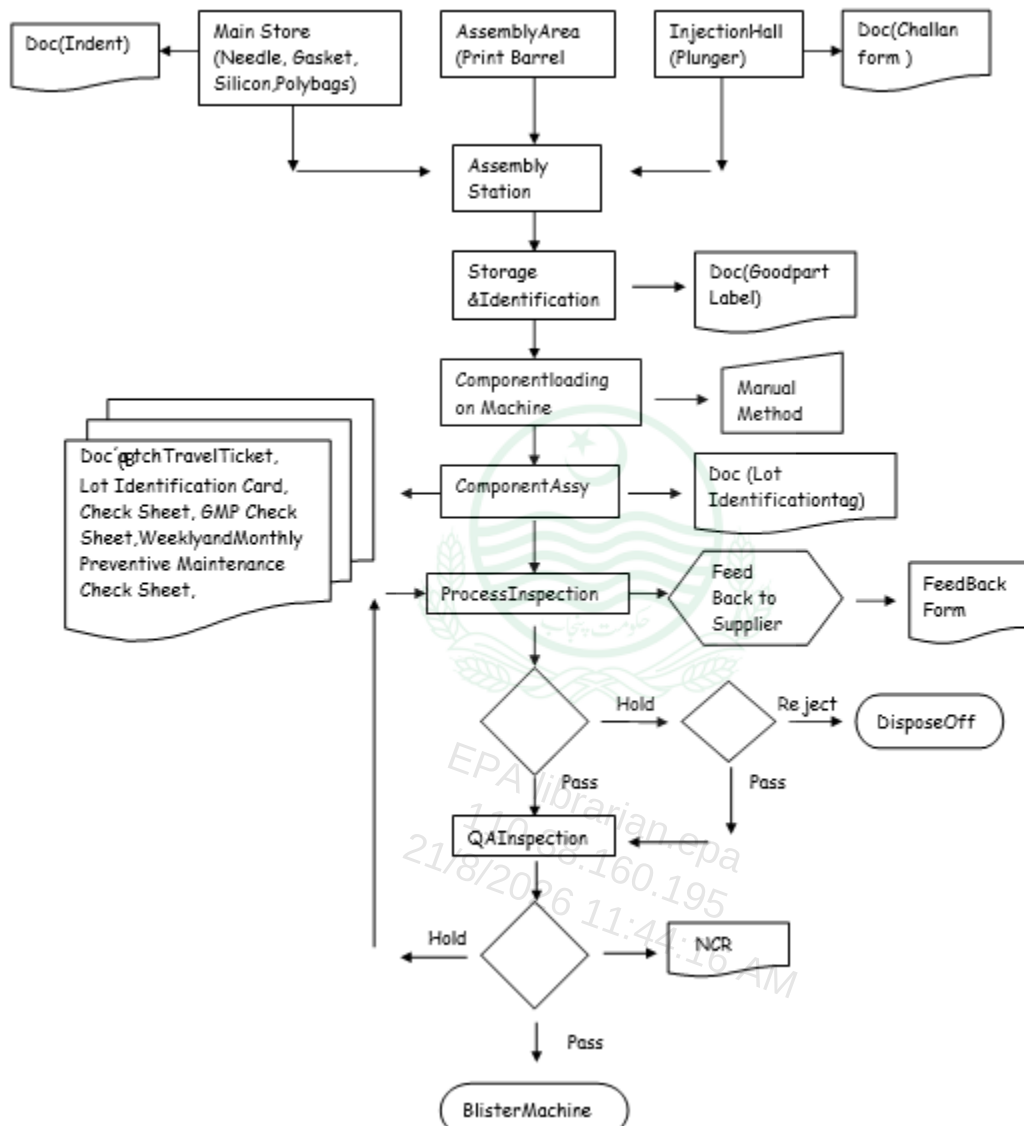
Oral Dosing Device





PROCESS FLOW OF PLASTIC INJECTION MOULDING

Assembly Process



Assembly Process

4.3 Site and Project layout:

The proposed project site is located at an altitude of about 203-210 meters above mean sea level. **Annexure** presents various location map of the project. Detailed layout map and site plan map of the project is presented in **Annexure - V**. The proposed project site is located at 10 km Muridke- Sheikhpura road on main road. The land of proposed project has already been procured. Presently, the proposed site is bounded by wall and open area.

4.4 Working Conditions

The following are the working conditions at proposed site of the Pharmaceutical unit.

- Altitude above mean sea level = 210 m
- Minimum (mean) ambient air temperature in January = 5.9°C
- Maximum ambient air temperature during May = 38.6 °C
- Earthquake design ground acceleration (g) = 0.15,
- Seismic zone = 2A
- Air quality clean

(Source: Pakistan met Department and Building Code of Pakistan, Seismic Provision 2007.)

Alternative site/No project option:

No Alternative site has been considered due to insignificant environmental impacts.

The proposed site fulfills the site selection criteria of Drug Regulatory of Pakistan, Ministry of health.

4.5 Solid waste disposal:

During operation of pharmaceutical unit small amount of solid waste will be generated. The syringes and IV sets have long shelf life hence its wastage is minimum. Expired pharmaceutical

products, if any, will be stored in separate room and sold out to EPA approved incineration facility. Reuse and recyclable material will be collected separately. Solid waste from offices and kitchens will be disposed of at designated place by TMA.

4.6 Water and Waste water:

A small quantity of water approximately 100 liter per day is used as cooling source. Hence no significant water will be generated as waste water during the operation phase. The waste water generated will be in small quantity and clean hence, will be reused for cooling and gardening.



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CHAPTER 5

PUBLIC CONSULTATION AND INFORMATION DISCLOSURE

5.1 SOCIO-ECONOMIC SURVEY OF THE PROJECT AREA

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

5.1.1 Methodology

5.1.1.1 Identification of stakeholders

Stake holders in this project were identified keeping in view the **Guidelines for Public consultation published by Pakistan EPA, 1997**. The stake holders were identified from the following groups.

- Local people
- Affected Communities
- Proponents
- Management of Nisa-SF Private Limited
- Government Agencies
- NGO
- Influential people
- Technical persons

- Poor People

5.1.1.2 Techniques for Public Consultation

The following principals were kept to select the techniques or public consultation

- Provision of material / information in easy language
- Providing sufficient time to understand
- Providing discussion to understand the information in a friendly way
- Portraying the actual issues relating to the project
- Discussion at the place which has easily access to the people
- Selection the time when maximum people are available
- Selection of influential people of project area
- Including of poor people
- Selection of people who give true presentation of community make up
- Including technical people who has clear knowledge of on the issues relating to Pharma industry.
- School teachers of the area were included in public consultations

- Concerned government departments were selected who had liaison with the execution of the project and environmental approval.

5.1.2 Dissemination of information

The EIA team reviewed the available information, held meetings with the proponent and designer and prepared a leaflet in Urdu containing all the necessary information about the proposed Nisa-SF Private Limited relating to the public interest. The pamphlet was distributed to the public in informal meetings group discussion and corner meetings at



Public and work places of Muridke road Village Pindi Rattan Singh. The original social survey Performa are being attached at **Annex-**

Recording the views of the people of area.

5.1.3 Public Meetings and Group discussions

The surrounding area is agricultural and rural in nature therefore we decided to hold physical contact instead of using print or electronic media. The group discussion is the way of opinion making used in the Punjab since hundreds of years. It is reliable and unbiased way to get opinion of the people. The seminar or public gathering was avoided as the poor people cannot attend and unable to express his views without influence of chaudry or wadera of the area or village.

5.1.4 Convenient Time and Place

The people in villages do not move away from village except in case of urgency. We went to them on their residences or work places. In this way no time and money of the people was spent and we got indiscriminate access to the concerned people. In this way the people who do not have money to travel to go to government departments got access to information and had opportunity to express his opinion in a liberal way.

5.1.5 Non-Government Organizations NGOs:

The following NGO are reported to be working in the area namely Mera Muridka, Support with Honour Foundation (SWHP). These were contacted but no body could be available for interview.

5.2 Limitations of the Public Consultation:

We tried our best to include all segments of life in to account according to education and professions as per local distribution of the social formation. But we could not include the enough women in public consultation process due to closeness of the society for women exposure to alien people and social taboo.

5.2.1 Questionnaire:

After review of the available information a questionnaire was developed containing all necessary information and question covering positive and negative aspects of the Nisa-SF Privat Limited The questionnaire comprised of two parts. First part has brief description of the project and part II was divided in the following parts:

- Socioeconomic background
- Positive impact of the Nisa-SF Private Limited
- Acceptance level of the Project.

5.3 Public Consultation:

The following stake holders were identified and meetings were held with them to inform them about the project design and know their response.

1. Management of proposed project.
2. Nobles of the area.
3. Teachers of the schools
4. Shopkeepers at main road
5. Shopkeepers of Muridke
6. Farmers
7. Laborers
8. Residents of the area

The socio-economic information was gathered through different techniques and methodologies and is derived from primary and secondary sources. Primary data were collected through following data collection tools: (i) Village profiles; (ii) Socio economic survey; Village profiles were carried out for all villages/settlements falling in Project Area. An introductory leaflet about basic information of the project was prepared in Urdu and distributed among the people at public places. This helped the people to understand about the project pros and cons. Leaflet is attached. After one week the area was revisited by the team of experts and again asked the opinion of the people about the project in the form of well-designed social survey questionnaire. Public consultations were also conducted in the area.

5.4 Issues Discussed:

Following issues were discussed during the stakeholder consultation:

- Personal information
- Education status
- Income level
- Residence information
- Information about project
- Possible impacts on natural vegetation, land and properties;
- Beneficial factors and involvement
- Opportunities for the local people.

- Adverse effects of the project
- Acceptance of the project by the people of the area
- Scope of the environmental assessment report

Different segments of the society were included to reflect the true and unbiased opinion. From numberdar to labor all segments of the project area were interviewed. The offices at district level were approached to have their verdict on the project. The people who were interviewed through a questionnaire which showed the following results:

Socio Economic Survey

- **Gender:**

Male

27

Female

0

- **Occupation:**

Farmer	09	31 %
Factory worker	05	20%
Shopkeeper	02	0.06%
Government service	01	0.03 %
Students	04	14%
Artisan /technicians	03	10 %

List of individuals consulted

Sr. No	Name	Designation	Address	Contact
1	Syed Hassan Ali	Labourer	Muridke, District Sheikhupura	0301-0554081
2	Tayyab M	Worker	Muridke, District Sheikhupura	0301-4239262
3	Amjad Hussain	Supervisor at factory	Muridke, District Sheikhupura	0302-4764989
4	Ali Ahmad	Machine operator	Phillu devta, Tehsil Muridke, District Sheikhupura	0331-4095874
5	Abdul Sattar	Quality chekcer	Muridke, District Sheikhupura	0310-1449413
6	Shahid	Loader	Muridke, District Sheikhupura	0324-9974384
7	Fahad Ali	Eye Officer at factory	Tehsil Muridke, District Sheikhupura	0315-4377547
8	Muhammad Ilyas	Farmer	Muridke, District Sheikhupura	0304-8356038
9	Ali Hussain	Officer	Village Sahiwala, Tehsil Muridke, district SHEIKHU PURA	0300-7493820
10	Sheikh Hanan Ali	Owner of Marriage Hall	Sheikhupura road, Mubarakabad, Near Anwaar Corporation Muridke.	0335-1415167
11	Amir Masih	Manager	Sheikhupura Road Mubarakabad near anwaar	0302-4482950

			corporation.	
12	Malik Sana Ullah	Farmer	Kothiala Virkaan, Muridke	0321-9496077
13	Mian Yasir Iqbal	Zimedar\Chair man UC 18	Kothiala Virkaan, Tehsil Muridke, District Sheikhupura	0300-9410807
14	Muhammad Adnan Ashraf	Employee at Nisa pharma	10 km Muridke-SHKP Road Tehsil Muridke	0321-8497974
15	Zulqarnain Ali	Zimedar\ Job	Pindi Rattan Singh, Post Office Service Factory, Muridke	0300-4589520
16	Rizwan aashiq	Product manager in NisaSF	Muridke-Sheikhupura road.	0300-4296944
17	Muhammad Yousaf	Zimedar	Pindi Rattan Singh, Muridke	
18	Safdar Ali	Employee at service factory	Pindi Rattan Singh, Muridke	0324-472901
19	Abdul qadoos	Job in Karkhana	Pindi Rattan Singh, Muridke	
20	Muhammad Shakeel	Job in Karkhana	Pindi Rattan Singh, Muridke	0300-4138140
21	Muhammad Aashiq	Zimedar	Pindi Rattan Singh, Muridke	
22	Haji Nisar	Shopkeper	Pindi Rattan Singh, Muridke	0302-4032687
23	Liaqat Ali	Zimedar	Chak Sannatta , Muridke	0321-5930331

24	Naveed Ahmad	Shopkeeper	Pindi Rattan Singh, Muridke	0309-7536320
25	Babar Ali	Shopkeeper	Pindi Rattan Singh, Muridke	0323-4613141
26	Mansab Khan	Job in service Factory	Service tyre factory	0306-5322900
27	Fahad Ali	Student	Pindi Rattan Singh, Muridke	

• **Consent on project implementation:**

Yes	27	100%
Conditional (yes)	0	0%
No	0	0%

5.5 Apprehensions of the people of the area:

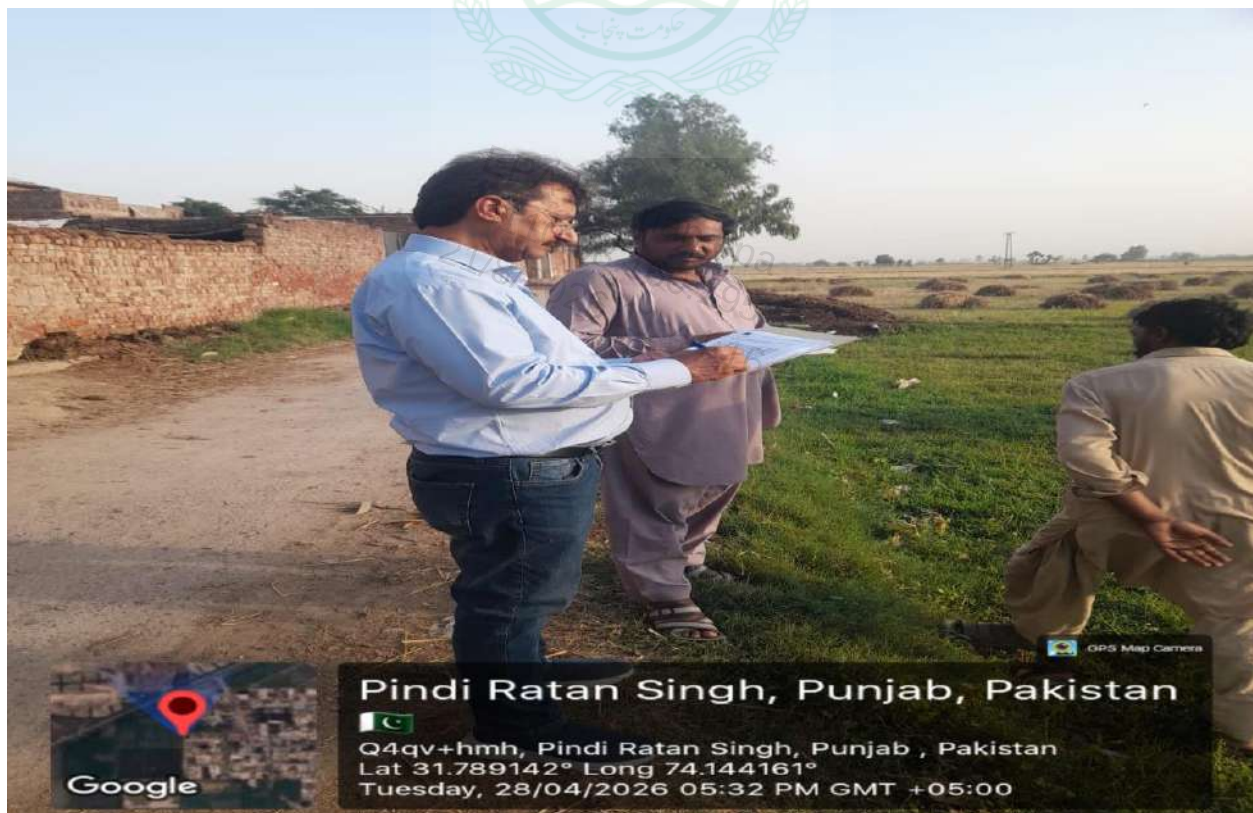
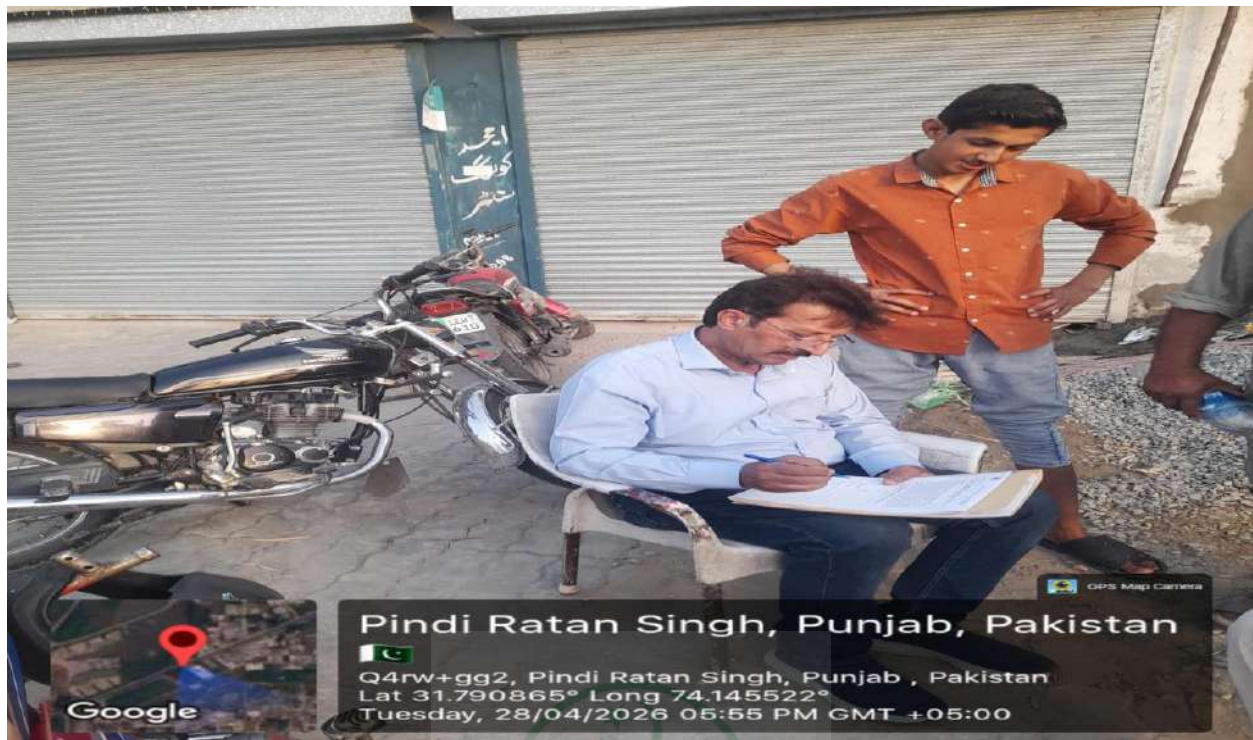
1. Low employment offers to local people during operation phase.
2. Social work in the area

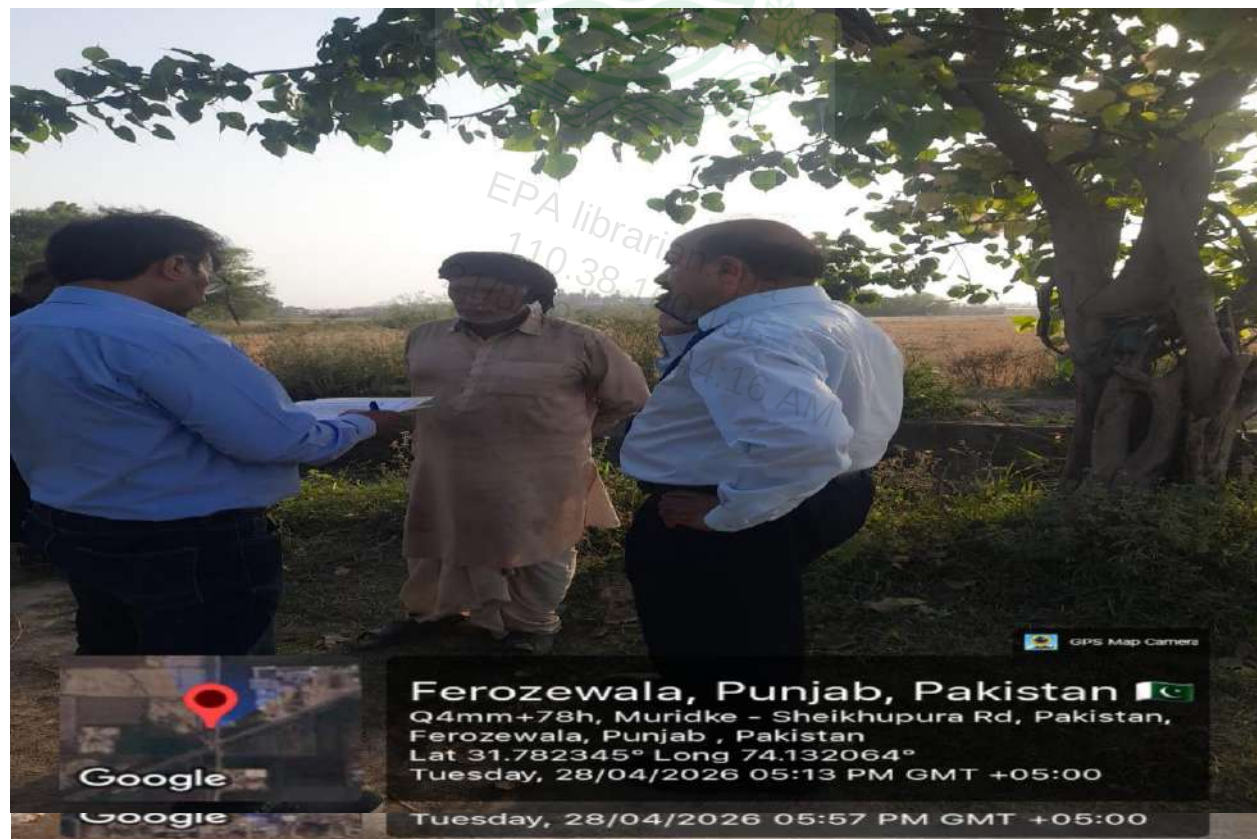
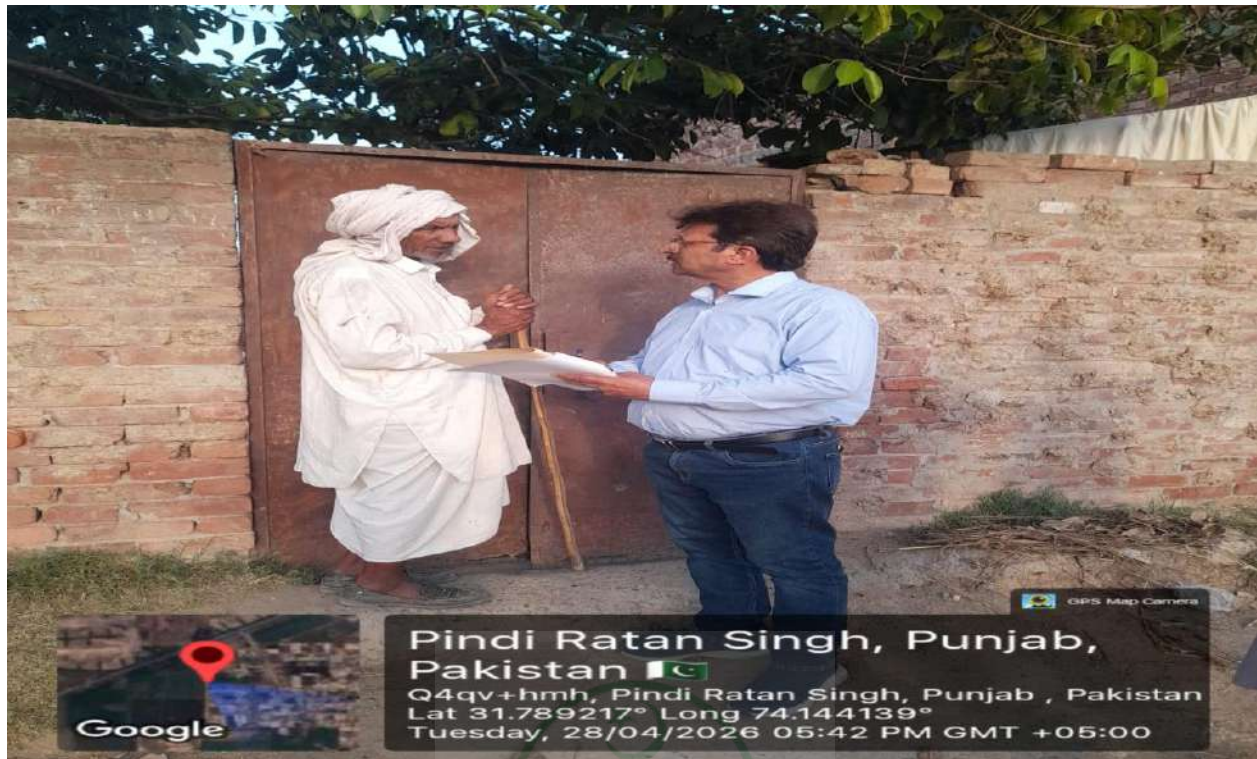
5.6 Mitigation of the People's Apprehensions

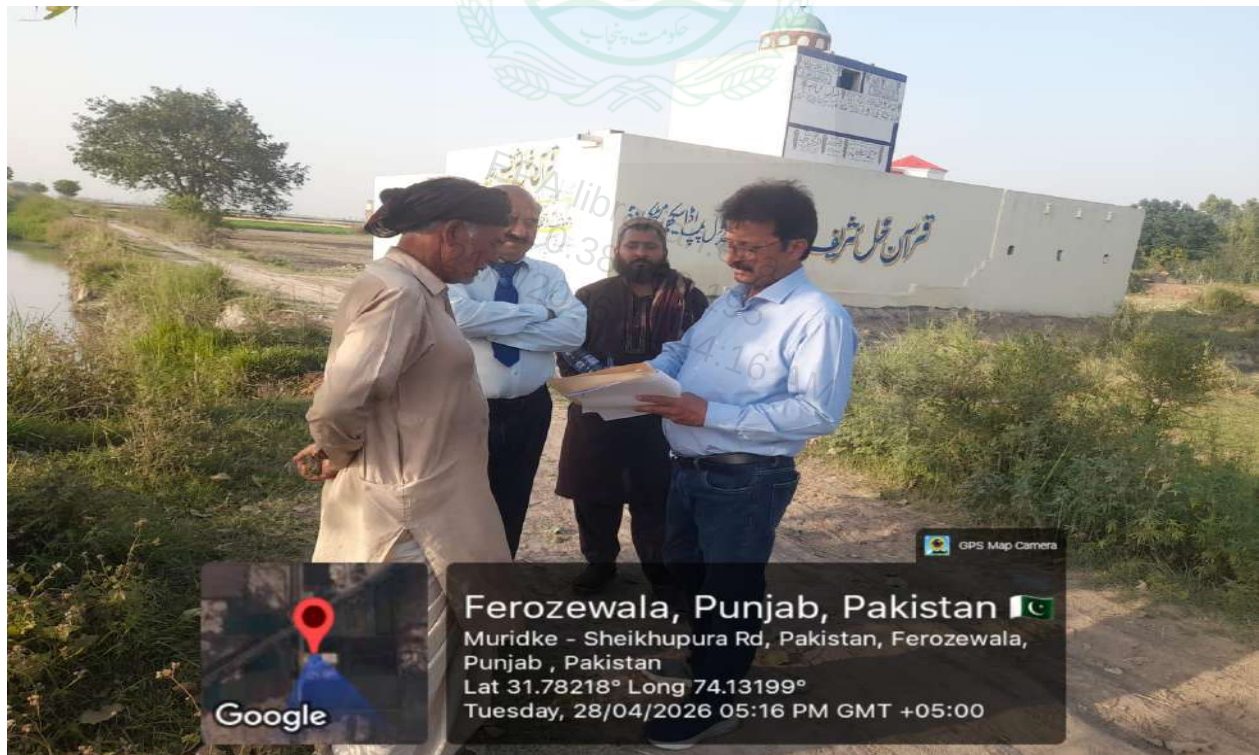
The maximum workers and technicians will be employed from the local area. However, officers will be recruited on open merit basis.

5.5 Images of Public consultation in the Project area

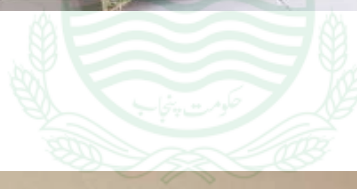














CHAPTER 6

SOCIAL AND ENVIRONMENTAL IMPACTS

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6.1 Introduction:

The proposed project is small scale pharmaceutical manufacturing unit. The proposed project may have short term impact on the environment during operation phases. During the operation phase no adverse impact will be seen. The project has overall positive impacts by providing a competitive, cost-effective pharmaceutical products which will reduce the import of pharmaceutical products in the country.

This EIA report identifies the impacts likely to arise as a result of operational activities and assesses the likely magnitude of the impact in order to provide some indication as to which impacts are likely to be most significant. A full determination of the significance of the identified impacts, based on an assessment of the magnitude in relation to the sensitivity of the receiving environment has been formed part of the EIA.

The operation phase of Nisa.SF can have several social and environmental impacts due to continuous industrial activities. During this phase, various processes such as plastic molding, sterilization, assembly, packaging, storage, transportation, and utility operations are carried out regularly. These activities may positively contribute to economic and healthcare development; however, they can also create environmental and social concerns if not properly managed.

6.2 Environmental Impacts:

Air Emissions:

During the operational phase, air emissions may be generated from diesel generators, boilers, plastic molding units, and sterilization processes. These emissions may include particulate matter, carbon monoxide, carbon dioxide, and volatile organic compounds (VOCs), which can affect ambient air quality and contribute to greenhouse gas emissions.

Wastewater Generation:

Wastewater generated from equipment washing, floor cleaning, cooling activities, and domestic usage may contain detergents, suspended solids, and chemical residues. Improper disposal of untreated wastewater may contaminate surface water and groundwater resources.

Solid Waste Generation:

The operation of the facility will generate solid waste including rejected syringes, defective IV sets, plastic scrap, packaging material, paper waste, and municipal waste from workers. Improper handling and disposal of these wastes may result in land pollution.

Hazardous Waste:

Small quantities of hazardous waste may be produced from sterilization chemicals, contaminated materials, lubricants, and maintenance activities. Improper management of hazardous waste can pose risks to human health and the environment.

Noise Pollution:

Very less Noise will be generated from injection molding machines, compressors, generators, air handling units, and packaging machinery. While generators can emit higher db's of noise. Continuous exposure to high noise levels may affect workers and nearby receptors if mitigation measures are not implemented.

6.3 Energy Consumption and Carbon Footprint:

Electricity and fuel consumption during plant operation may contribute to greenhouse gas emissions and increase the carbon footprint of the facility.

6.4 Mitigation measures:

The company is committed to minimizing the environmental impacts arising from the operation of the syringe and IV set manufacturing facility through the implementation of a comprehensive Environmental Management Plan (EMP). A range of mitigation measures will be adopted to ensure environmentally responsible and sustainable operations throughout the project lifecycle.

To control air emissions, the company will install appropriate air pollution control systems such as scrubbers, filters, and other advanced emission control devices on boilers, generators, and production units. Cleaner fuel options and energy-efficient machinery will be utilized wherever

Sustainable Environmental Solutions



possible to reduce the release of particulate matter, carbon emissions, and volatile organic compounds. Regular maintenance of equipment and continuous monitoring of air quality will be conducted to ensure compliance with applicable environmental standards.

In order to manage wastewater effectively, all effluents generated from production processes, cleaning activities, and domestic use will be treated through a properly designed Effluent Treatment Plant (ETP). The treated wastewater will meet national discharge standards before being released into the environment or reused for non-potable purposes such as landscaping and cleaning. The company will also promote water conservation practices, including recycling and reuse of treated water, to minimize freshwater consumption and reduce pressure on local water resources.

The company will implement a structured solid waste management system to ensure safe handling and disposal of all generated waste. Waste will be segregated at source into recyclable, non-recyclable, and hazardous categories. Recyclable materials such as plastic scraps and packaging waste will be sent to authorized recycling facilities, while non-recyclable waste will be disposed of at designated landfill sites in an environmentally safe manner. Hazardous waste, including chemical residues and contaminated materials, will be handled separately and disposed of through certified hazardous waste management contractors in compliance with regulatory requirements.

To mitigate noise pollution, the company will adopt engineering controls such as installation of acoustic enclosures, silencers, and vibration dampers on noise-generating equipment including compressors, generators, and molding machines. Preventive maintenance schedules will be strictly followed to avoid excessive noise due to equipment wear and tear. Proper plant layout design will ensure that high-noise areas are located away from administrative and sensitive zones. In addition, workers operating in high-noise areas will be provided with personal protective equipment (PPE) such as earplugs and earmuffs.

The company is also committed to energy conservation and reduction of its carbon footprint. Energy-efficient technologies, including LED lighting, high-efficiency motors, and optimized production systems, will be adopted across the facility. Renewable energy sources such as solar

power is being integrated into operations to reduce reliance on fossil fuels. Regular energy audits are conducted to identify opportunities for further improvement in energy efficiency.

Employee awareness programs will also be conducted to encourage responsible water usage and minimize wastage across all operational activities.

The company will ensure strict adherence to occupational health and safety standards to prevent environmental contamination arising from accidents or unsafe practices. Proper storage, handling, and transportation of raw materials and chemicals will be ensured. Emergency response procedures will be established to effectively manage any accidental spills, leaks, or fire incidents that could potentially impact the environment.

Finally, the company will establish a robust environmental monitoring and reporting system. Regular monitoring of air, water, noise, and waste parameters will be carried out to ensure compliance with environmental regulations. Periodic environmental audits will be conducted to assess the effectiveness of implemented mitigation measures and to support continuous environmental performance improvement.

Through these initiatives, the company demonstrates its commitment to sustainable industrial practices and environmental protection, ensuring that the operation of the syringe and IV set manufacturing facility has minimal adverse impact on the surrounding environment and communities.

6.5 Social Impacts

Employment Generation

The project will create direct and indirect employment opportunities for skilled and unskilled workers, which will positively contribute to local socioeconomic conditions.

in Healthcare Supply

The manufacturing of syringes and IV sets will support the healthcare sector by ensuring the availability of essential medical devices for hospitals, clinics, and healthcare facilities.

Occupational Health and Safety Risks

Workers may be exposed to risks associated with machinery operation, noise, chemicals, heat, and electrical equipment. Without proper safety measures, workplace accidents and health issues may occur.

Traffic Impacts

Transportation of raw materials and finished products may increase traffic movement in the surrounding area, potentially causing road congestion, noise, and dust emissions.

Community Health and Safety

Improper handling of emissions, wastewater, or waste materials may affect nearby communities through air pollution, odor generation, and contamination of environmental resources.

Economic Development

The project may contribute positively to local economic development through industrial growth, business opportunities, and infrastructure improvement in the surrounding area.

6.6 Mitigation measures:

The company is committed to ensuring that the social impacts associated with the operation of the syringe and IV set manufacturing facility are managed responsibly through the implementation of appropriate mitigation measures. These measures are designed to enhance positive social outcomes while minimizing any adverse effects on workers and surrounding communities.

To minimize traffic-related impacts, the company will develop a proper transportation management plan. This will include scheduling of material transport during non-peak hours to

reduce congestion on nearby roads. The company will ensure that transport vehicles comply with emission standards and are properly maintained

Community health and safety will be given high priority by the company. Proper environmental control measures for air emissions, wastewater, and solid waste will be strictly implemented to prevent any negative impact on nearby populations.

The company will also focus on maintaining good labor relations and ensuring a healthy working environment. Fair wages, reasonable working hours, and safe working conditions will be provided to all employees. Worker rights will be respected.

In conclusion, through these mitigation measures, the company aims to ensure that the social impacts of the syringe and IV set manufacturing project are effectively managed. The focus will remain on promoting community well-being, ensuring worker safety, enhancing employment opportunities, and fostering sustainable social development in the project area.



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CHAPTER 7

ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN AND MONITORING

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7.1 GENERAL:

This section provides brief description of environmental issues, mitigation measures to contain eliminate and/or reduce environmental and social impacts to an acceptable level, institutional arrangement for the implementation of the mitigation measures and also carrying out environmental monitoring for air quality, water quality, and noise pollution related parameters.

This ESMP is a delivery mechanism for environmental and social mitigation measures made in the Assessment Report. The purpose of the EMP is to ensure that these recommendations are translated into practical management actions which can be adequately resourced and integrated into the Project phases. The ESMP is, therefore, an environmental management tool used to ensure that undue or reasonably avoidable adverse impacts of construction, operation and decommissioning are prevented and that the positive benefits of the Projects are enhanced (Lochner, 2005).

The Environmental and Social Management Plan (ESMP) is developed to eliminate and / or mitigate the impacts envisaged at the design, construction and the operational stages and provide specific guidelines for long-term monitoring by identifying the roles and responsibilities of the Proponent, Design Consultant, and Contractor(s).

The reason for making ESMP is to eliminate and mitigate the potential impacts at the design, construction and operational stage of the project. It provides the specific guidelines for long term monitoring by identifying the role and responsibilities of the proponent, design consultant and contractors.

The social and Environmental management Plan includes:

- Construction Management Plan;
- Traffic Control Management Plan;
- Waste Management Plan;
- Employment and Workforce Policy;
- Local Employment Strategy;
- Occupational Health and Safety Policy;

- Emergency Response Plan.
- Environmental management plan

This proposed project has no adverse environmental impact.

7.2 OBJECTIVES OF THE ENVIRONMENTAL MANAGEMENT PLAN

The Environmental Management Plan (EMP) will help the management to address the future likely negative impacts of the proposed Project, enhance the Project's overall benefits and introduce standards of good environmental practice. The primary objectives of the EMP are to:

- Define the responsibilities of the Project Proponent and other key players during the design, construction and the operational phases;
- Facilitate the implementation of the mitigation measures by providing technical details of each project impact, and proposing an implementation schedule of the proposed mitigation measures;
- Develop a monitoring mechanism and identify monitoring parameters to ensure that all the proposed mitigation measures are completely and effectively implemented;
- Identify training requirements at various levels and provide a plan for the implementation of training sessions;
- Identify the resources required to implement the EMP and outline corresponding financing arrangements;
- Providing a cost estimate for all the proposed EMP actions.

7.3 KEY ENVIRONMENTAL ISSUES

Following are the key issues, which are envisaged for the proposed Project at the design, construction and operational stages;

1. Traffic management during transport of material during construction.
2. Bringing down the pH, and TDS within the PEQS from sanitary waste water effluents
3. Control of dust in manufacturing area using HVAC system.
4. Maintenance of Noise levels within PEQS;
5. Health and safety of workers; and
6. Interaction with the people of the area for feedback on social and environmental control measures.

7.4 SPECIFIC IMPLEMENTATION RESPONSIBILITIES

This section describes the responsibilities of different functionaries during the design, construction and operational phases of the proposed project.

7.4.1 Stakeholders Role and Responsibilities in EMP

- Contractor(s)
- Chief Executive officer of Nisa-SF Private Limited
- Administration of Nisa-SF Private limited
- Head of quality control officer
- Area sale manger
- Social welfare officer / Public Relation officer

7.5 ENVIRONMENTAL MONITORING AND IMPROVEMENT SYSTEM

1. Operational Phase

Long Term environmental monitoring (till the project life) would be conducted at completed site at post closure stage to ensure that there is no release of contaminants from the site that may impact the health of the surrounding environment and violation of PEQS.

- Deployment of trained and dedicated staff to monitor the quality of the effluent and emissions and its periodic reporting on Quarterly basis regarding compliance of PEQS to EPA, Punjab.
- Proper maintenance of the pollution control equipment and its function.
- Similarly, Occupational Health and Safety measures will be implemented and monitored to check the effects of Pharmaceutical operation on the O&M staff. Good maintenance of the project.
- Assure the adequate funds allocation for the implementation of EMP.

Table 7.1:

Environmental Management Plan (EMP) of Nisa-SF Private Limited

Sr. No.	Adverse effect	Action proposed	Responsibility
• Operation Phase			
1	Air Pollution	• Smooth operation of filter system	Quality Control officer

2	Water pollution	Municipal waste water will be treated in septic tank to compliance the effluent quality standards prescribed in PEQS	EHS officer
3	Noise pollution	No significant impact of noise pollution during operation of pharmaceutical unit	
4	Health ,Safety and Environment	- During manufacturing process safety of workers shall be ensured. - For indoor Air quality HVAC and HEPA filter will be used. - Personal Protective Equipment will be used	Head of production and quality control officer
5	Environment policy	Development of environment policy	Quality control officer.
6	Social compliance	Interaction between the management and people of the area	Manager admin and administrative officer
7	Record keeping	Record of monitoring reports	Quality control officer
8	Emergency plan	Working and maintenance of all health and safety equipment, firefighting equipment and extinguishers	Quality control officer

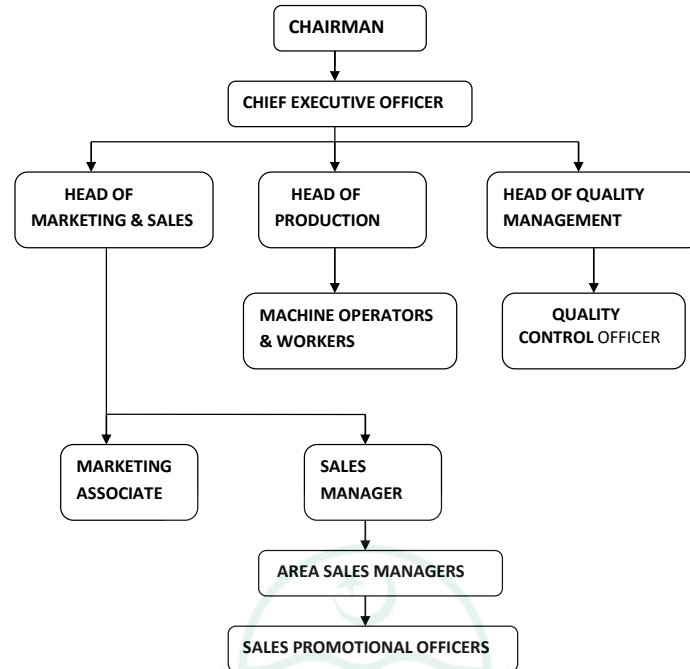
9	Compensation in case of casualties	In case of any injury to worker, compensation / insurance may be paid	Chairman and Chief Executive
10	Training of staff on health and safety	Regular training on health and safety is required	Head of production area and quality control officer
11	Budget for EMP	To ensure the provision of budget for environmental management	Chairman and Owners of the proposed project.

1. Institutional Arrangements:

The proposed Nisa.SF will have following staff management for operation phase.

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CHAPTER -8

CONCLUSION AND RECOMMENDATION

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8.1 CONCLUSION AND RECOMMENDATIONS:

The nature of the pharmaceutical unit is known to have minimal adverse impact on the surrounding environment. There will be some temporary or short-term impact will be observed that will mitigated through proper environmental management system.

The local's expectation on the Project is in line with the Project's commitment on environmental and social responsibility. On the basis of the findings of the EIA, it is concluded that the project will not pose any adverse impact on the local population and the environment. Therefore, it is recommended for environmental approval.



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