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**PROJECT SUMMARY TABLE**

Section	Parameter	Details
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	Project Location	Inside Din Garh (54010), District Kasur, Punjab
	Geographical Coordinates	<ul style="list-style-type: none"> Latitude: 31°06'43.1"N Longitude: 74°27'01.8"E
2. Proponent Information	Proponent Name	Mr. Muhammad Aslam
	CNIC	35102-0637223-1
	Proponent Address	Inside Din Garh (54010), District Kasur
3. Project Overview	Total Project Cost	Rs. 650 Million
	Project type	Establishment
	Process Description	The proposed project involves the construction and operation of a raw to finish leather processing unit capable of handling 100 tons of leather per day. The facility will also feature a chrome recovery plant (CRP) with a capacity of 100 m ³ /day and a wastewater treatment plant (WWTP) with a capacity of 1,000 m ³ /day
	Land Area and Ownership	6 kanals and 5 marlas Owned
	Allied Facilities	Admin Block, Generators
4. Waste Management	Types of Waste	Leather trimmings, shavings and buffing dust etc
	Estimated Waste Generation	40 Tonnes/Month
	Waste Handling Measures	Labeled plastic covered bins
	Final Disposal Plan	Handed over to Contractors
5. Wastewater Management	Coordinates of WWTP	31°06'44.7"N, 74°27'00.6"E
	Treatment Method	RO-Plant
	Disposal Method & Location	Rohi Nala



	NOC from Authority	KTWMA																				
6. Chrome Recovery Plant	Capacity	100m ³ /day																				
7. Rainwater Harvesting	Harvesting Infrastructure	Pits and underground storage tanks																				
	Collection Source	roofs of the production halls and storage sheds etc																				
	Implementation Status	Planned																				
8. Plantation & Green Development	Proposed Green Area	10% of the total area of the project																				
	Tree Types and Numbers	<table border="1"> <thead> <tr> <th>Common Name</th> <th>Scientific Name</th> <th>Quantity</th> </tr> </thead> <tbody> <tr> <td>Neem</td> <td>Azadirachta indica</td> <td>300</td> </tr> <tr> <td>Sukh Chain</td> <td>Pongamia pinnata</td> <td>200</td> </tr> <tr> <td>Amaltas</td> <td>Cassia fistula</td> <td>150</td> </tr> <tr> <td>Kikar</td> <td>Acacia nilotica</td> <td>150</td> </tr> <tr> <td>Arjun Tree</td> <td>Terminalia arjuna</td> <td>100</td> </tr> <tr> <td>Pilkhan</td> <td>Ficus virens</td> <td>100</td> </tr> </tbody> </table>	Common Name	Scientific Name	Quantity	Neem	Azadirachta indica	300	Sukh Chain	Pongamia pinnata	200	Amaltas	Cassia fistula	150	Kikar	Acacia nilotica	150	Arjun Tree	Terminalia arjuna	100	Pilkhan	Ficus virens
Common Name	Scientific Name	Quantity																				
Neem	Azadirachta indica	300																				
Sukh Chain	Pongamia pinnata	200																				
Amaltas	Cassia fistula	150																				
Kikar	Acacia nilotica	150																				
Arjun Tree	Terminalia arjuna	100																				
Pilkhan	Ficus virens	100																				
9. CSR & Community Welfare	CSR Budget	3% to 5% of the total Project Cost																				
	Activities	Health & Safety Education Environment & Sustainability Water, Sanitation & Hygiene (WASH) Livelihood & Skill Development Community Engagement & Welfare																				



EXECUTIVE SUMMARY

Title & Location of the project

This Environmental Impact Assessment (EIA) study has been prepared for the proposed project titled "**Establishment of Leather Processing Unit (Raw to Finish) with Chrome Recovery Plant (CRP) and Wastewater Treatment Plant (WWTP)**" by **M/S Kasur Tanneries (Pvt.) Ltd.**, located inside **Din Garh (54010), District Kasur, Punjab**.

The proposed development involves the construction and operation of a fully integrated leather processing facility with a capacity of **100 tons of leather per day**. The project includes a **Chrome Recovery Plant (100 m³/day)** to recover and reuse chromium from tanning effluent, and a **Wastewater Treatment Plant (1,000 m³/day)** to ensure compliance with national effluent discharge standards. The total land area for the project is **6 kanals and 5 marlas**, with a total capital investment of **PKR 650 million**.

The proponent affirms that the existing facility has been in operation prior to the promulgation of the **Punjab Environmental Protection Act, 1997**, which is substantiated through the provision of historical utility documentation, including an electricity bill dated before 1997 (attached as Annexure). Recognizing the potential environmental impacts associated with tanning operations, particularly in relation to effluent discharge, solid waste generation, and air emissions, the proponent has proactively initiated the process of obtaining formal environmental approval under the Punjab Environmental Protection Act, 1997 (amended) and associated regulations.

The project falls under Schedule II, Category B (Manufacturing and Processing), Clause 10 (Tannery and Leather Units) of the Review of Initial Environmental Examination (IEE) and Environmental Impact Assessment (EIA) Regulations, 2022. In accordance with Clause 5(f) of the Policy and Procedure for the Filing, Review, and Approval of Environmental Assessments, the Terms of Reference (TORs) for this study were duly developed and are attached as an Annexure.

This EIA presents a comprehensive assessment of the anticipated environmental and socio-economic impacts of the project, identifies potential risks, and proposes detailed



mitigation and monitoring strategies. The proponent commits to implementing these measures in letter and spirit, ensuring sustainable operations and adherence to applicable environmental standards. This initiative reflects the proponent's commitment to environmental stewardship and regulatory compliance for all present and future activities

Background of the Project:

The site for this project is owned by the proponent of Kasur Tanneries Pvt Ltd. Land documents are attached as annexure and the layout map of the building is also attached as **Annexure** with this report. The proponent is intended to do construction of raw to finish unit chrome treatment and wastewater treatment plant.

Location

Subject project is located Inside Din Garh (54010), District Kasur Pakistan. having coordinates:

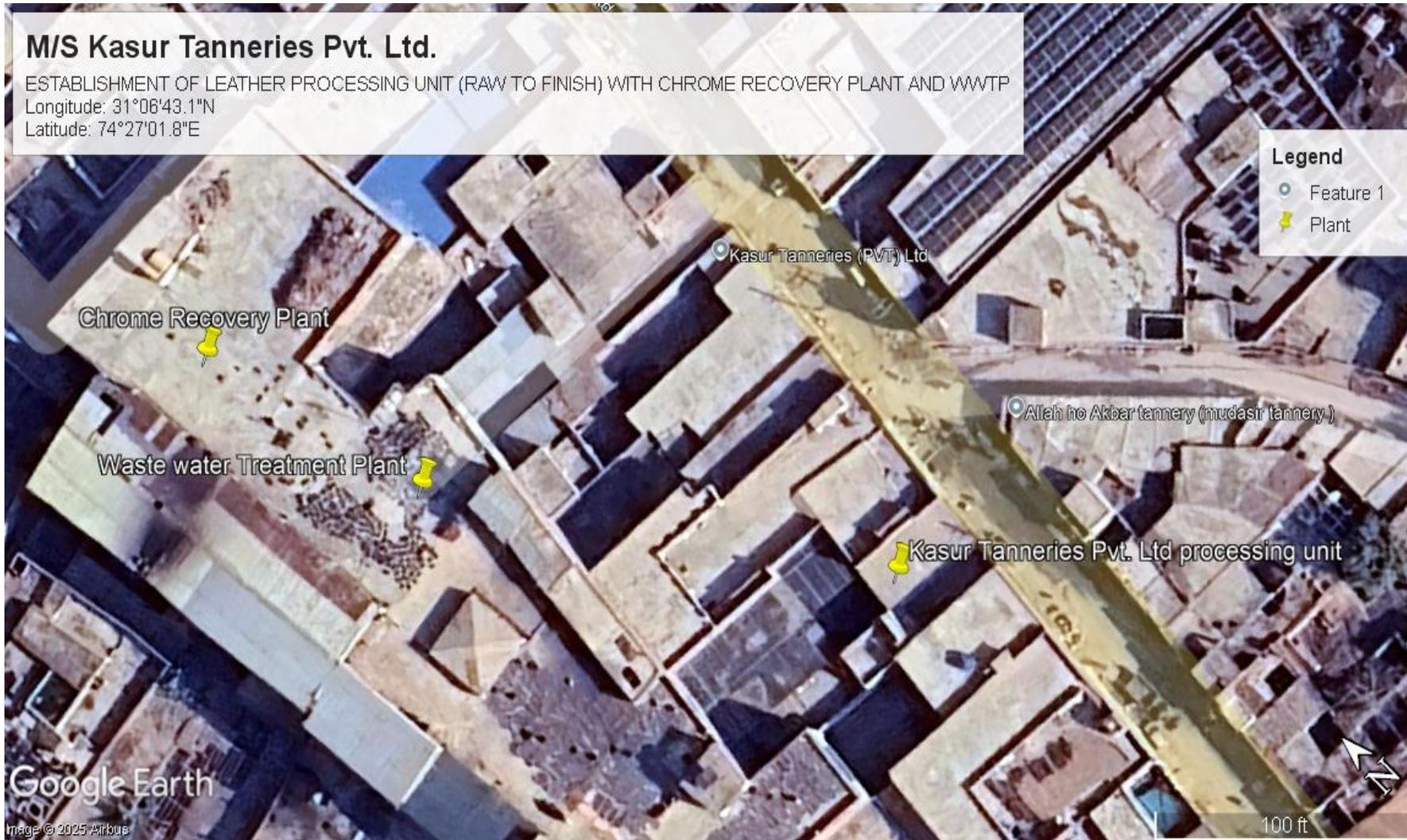
- **Latitude: 31°06'43.1"N**
- **Longitude: 74°27'01.8"E**

East..... Tannery unit

West..... Industrial

North..... Access Road

South..... Access Road



Figure

1: **Google map of site:** For further details, layout map and Google earth map of the project is attached as **Annexure-B** with the report.

Table 1: Detail of Proponent

Name	Mr. Muhammad Aslam
CNIC	35102-0637223-1
Mailing Address	Inside Din Garh (54010), District Kasur

For further details CNIC of the proponent and other relevant documents are attached as **Annexure-** with this report.

Table 2: Brief Project Description

Name of the project:	Subject project for which this Environmental Impact assessment study has been conducted is the Establishment of Leather Processing Unit (Raw to Finish) With Chrome Recovery Plant and Waste Water Treatment Plant. Located Inside Din Garh (54010), Kasur.
Location of the project:	Inside Din Garh (54010), District Kasur
Proposed Area:	The total area of land is 6 kanals and 5 marlas. The production capacity will be 100 tons/day leather.
Nature of Project:	Nature of the project is establishment and construction will be started after getting the environmental approval.
Cost of the project:	The cost of the project will be 650 million Rs.
Project process:	Process will include Raw to Finish Unit.
Production capacity	The production capacity will be 100 tons/day leather.
Power Requirement:	1500 KW from WAPDA
Labor/ Workforce:	During construction: 35-40 During Operation: 40-50
Water Requirement:	During Construction: approximately 100 cubic meter per day for constructional and domestic uses. During Operation: maximum 70 cubic meter/d for domestic use and for industrial purposes 1500 Cubic meter per day.
Solid waste:	During Construction: 90-120 kg/day construction and domestic waste During operation: 30-40 kg/day domestic and project related waste



Details of Consultants:

Pak Green Enviro-Engineering (Pvt.) Ltd, as independent consultants, has been appointed by the proponent to conduct Environmental Impact Assessment (EIA) report.

Company office address: 46-M, Gulberg III, Faisalabad

Contact: 042-35441444, 0303-4442335.

For detail company profile see the Chapter # 1 “Introduction”

Authority letter in the favor of the consultant is attached as **Annexure** with the report.

The major impacts

In order to identify all the activities associated with the project during construction and operation phase with potential to cause adverse environmental impacts and harm a thorough review has been conducted. Project will not have any significant adverse impacts on the nearby community and on environment. Overall the project will have positive impacts on the local population and country as a whole.



Table 3: Environmental and Social Impacts Across Construction and Operation Phases (Kasur Tanneries)



Potential Impact	Phase	Criteria for Significance	Key Mitigation Measures
Dust Emissions	Construction	PM10 >150 µg/m ³ (PEQS) or visible dust beyond site boundaries.	<ul style="list-style-type: none">- Use recycled tannery water for sprinkling unpaved roads.- Cover raw material trucks; enforce 20 km/h speed limits.- Keep stockpiles ≥250m from communities.
Construction Noise	Construction	Noise >75 dB (PEQS) or OSHA standards; community complaints.	<ul style="list-style-type: none">- Conduct pre-construction noise surveys.- Use noise barriers; restrict nighttime machinery.- Avoid high-noise activities during local events.
Vegetation Loss/Soil Erosion	Construction	Unnecessary removal of native vegetation (e.g., Sheesham trees).	<ul style="list-style-type: none">- Minimize land clearance; replant native species.- Use erosion-control mats on slopes.
Groundwater Depletion	Construction	Reduced water availability for communities near extraction sites.	<ul style="list-style-type: none">- Use recycled tannery water for construction.- Monitor groundwater levels monthly.



Potential Impact	Phase	Criteria for Significance	Key Mitigation Measures
Soil Contamination	Construction	Visible hydrocarbon spills or chromium leakage.	<ul style="list-style-type: none">- Store fuels in sealed containers; deploy spill kits.- Use impermeable liners in storage areas.
Worker Safety	Construction	Accidents due to traffic or unsafe practices (no formal guidelines).	<ul style="list-style-type: none">- Enforce PPE (helmets, boots); train workers.- Assign traffic controllers near site entrances.
Community Conflict	Construction	Complaints about dust, noise, or cultural insensitivity.	<ul style="list-style-type: none">- Hire local laborers.- Hold grievance redressal meetings with communities.
Machinery Noise	Operation	Noise >65 dB (PEQS) or OSHA standards in worker zones.	<ul style="list-style-type: none">- Install soundproofing in high-noise areas (e.g., drumming machines).- Provide certified ear protection to workers.
Chemical Exposure	Operation	Chromium/acid fumes exceeding PEQS or WHO limits.	<ul style="list-style-type: none">- Install exhaust ventilation systems.- Mandate PPE (gloves, masks); conduct quarterly health screenings.



Potential Impact	Phase	Criteria for Significance	Key Mitigation Measures
Solid/Hazardous Waste	Operation	Improper disposal of chromium sludge or organic waste.	<ul style="list-style-type: none">- Build lined landfills for hazardous waste.- Treat sludge before disposal; sell biodegradable waste to farmers.
Groundwater Contamination	Operation	Chromium >0.05 mg/L (PEQS) in community wells.	<ul style="list-style-type: none">- Install CETPs with chromium recovery systems.- Monitor wells bi-monthly; provide alternative water if contaminated.
Worker Health & Safety	Operation	Injuries from machinery or chemical burns.	<ul style="list-style-type: none">- Train workers on emergency protocols.- Equip facilities with first-aid kits and eye-wash stations.
Community Health	Operation	Increased skin/respiratory diseases linked to tannery emissions.	<ul style="list-style-type: none">- Fund mobile health camps for nearby villages.- Plant Neem trees as green buffers to absorb pollutants.
Resource Depletion	Operation	Over-extraction of groundwater for tanning processes.	<ul style="list-style-type: none">- Adopt water-efficient tech (e.g., reverse osmosis).- Harvest rainwater for non-process uses.





Proposed Environmental Monitoring

To oversee the environmental performance of the project through its lifecycle enforcing the PEQS an Environmental Monitoring Program should be formulated which ensures effective surveillance of the environmental parameters at various stages of the project development and compliances with PEQS and legal obligations. Monitoring for following Environmental Parameters is recommended:

- **Ambient Air**

Monitoring for ambient air should be conducted on regular basis during construction and operation phases of the project and report should be submitted to EPA Punjab.

- **Noise**

Regular monitoring for noise level should be maintained periodically during construction and operation phases of the project and report should be submitted to EPA Punjab.

- **Water quality**

Regular monitoring of water quality should be conducted on regular basis during construction and operation phases of the project and report should be submitted to EPA Punjab.

Recommendation: Environmental Monitoring data log book should be maintained by the project proponent. Environmental Monitoring reports are attached with this report as Annexure

Table 4: Proposed Environmental Monitoring Program:

Sr. No.	Parameters	Monitoring Schedules During Construction	Monitoring Schedules During Operation	Monitoring Duration
---------	------------	------------------------------------------	---------------------------------------	---------------------



1	Stack Emission Analysis	Quarterly	Quarterly	As per PEQ's
1	Ambient Air Monitoring (NO _x , CO ₂ , SO ₂ , PM ₁₀)	Quarterly	Quarterly	As per PEQ's
2	Noise Level	Quarterly	Quarterly	As per PEQ's
4	Drinking water quality	Quarterly	Quarterly	Some parameters on site Others in lab
5	Waste Water	Quarterly	Quarterly	Some Parameters on Site Others in Lab



Chapter 1

Introduction

1.1 Purpose of the Report

This Environmental Impact Assessment (EIA) report has been prepared in accordance with the **Punjab Environmental Protection Act, 1997 (Amended 2012)** and the **Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022**. The purpose of the report is to assess the potential environmental and social impacts of the construction and operation of a Raw to finish unit with chrome recovery plant and WWTP by **M/s Kasur Tanneries Pvt. Limited**. The facility is to be located in Din Garh, District Kasur, and will include a raw-to-finish leather processing unit, a chrome recovery plant, and a wastewater treatment plant.

The EIA aims to identify and evaluate any adverse environmental effects during all phases of the project, propose mitigation measures, and ensure compliance with applicable environmental laws and standards. This report supports the proponent in securing a **No Objection Certificate (NOC)** from the **Punjab Environmental Protection Agency (EPA)** for the construction phase of the project. It also demonstrates the proponent's commitment to sustainable industrial development by integrating environmental considerations into the planning and design phases.

1.2 Identification of Project and Proponent

The project is the establishment of an integrated **leather processing unit** that will convert raw animal hides into finished leather products using chemical and mechanical processes. The facility will incorporate a chrome recovery plant and a wastewater treatment plant to manage process-related pollutants and ensure environmentally compliant operations.



The project is being developed by **M/s Kasur Tanneries Pvt. Limited**, a private sector organization led by **Mr. Muhammad Aslam**, who serves as the Chief Executive Officer. The company is based in Kasur, a well-known industrial hub for leather production in Pakistan.

Table 5: Proponent Information:

Detail	Description
<i>Name</i>	Mr. Muhammad Aslam
<i>Designation</i>	Chief Executive Officer (CEO)
<i>Company Name</i>	M/s Kasur Tanneries Pvt. Limited
<i>Address</i>	House No. VI-2-5-9, Muhalla Kot Paka Qila, Kasur
<i>CNIC</i>	35102-0637223-1
<i>Email</i>	info@kasurtanneries.com

The proponent is fully responsible for project implementation, regulatory compliance, and environmental performance throughout the project's lifecycle.

1.3 Details of Consultant

To ensure a professional and comprehensive assessment, **Pak Green Enviro-Engineering Pvt. Ltd.** has been engaged as the environmental consultant for this EIA. The firm is registered with Punjab EPA and holds a valid Certificate of Practice. It has extensive experience in conducting environmental studies for manufacturing and processing industries and has deployed a multidisciplinary team of experts for this project.

The consultant has conducted site visits, stakeholder consultations, data collection, and environmental analysis in order to prepare this report. The consultant has also ensured that the methodology and assessment criteria used are consistent with EPA guidelines and international best practices.

1.4 Brief Description of Nature, Size, and Location of the Project

The proposed project involves the construction and operation of a **raw to finish leather processing unit** capable of handling **100 tons of leather per day**. The facility



will also feature a **chrome recovery plant (CRP)** with a capacity of **100 m³/day** and a **wastewater treatment plant (WWTP)** with a capacity of **1,000 m³/day**. The project is intended to be a model of environmentally responsible industrial activity, combining efficient production with pollution control technologies.

Project Nature and Components

The nature of the project is industrial, focusing on manufacturing and processing operations. The project includes multiple integrated components which support the main leather processing activities:

- A main production block for tanning, dyeing, and finishing of hides and skins
- A chrome recovery unit for recovering chromium from tanning waste
- A multi-stage wastewater treatment system to ensure compliance with NEQS
- Utility infrastructure such as power supply, water storage, chemical storage, solid waste collection, and administrative offices

Project Scale and Investment

The proposed facility will be established on a plot of **6 kanal and 5 marlas**. The estimated total investment is **PKR 650 million**. The facility is designed to meet both domestic and export market demands and will employ local manpower.

Table 6:Key Project Parameters:

Parameter	Value
Daily Leather Processing Capacity	100 tons/day
Chrome Recovery Plant Capacity	100 m ³ /day
Wastewater Treatment Capacity	1,000 m ³ /day
Total Land Area	6 Kanals and 5 marlas
Estimated Project Cost	PKR 650 million
Location	Din Garh, District Kasur



Project Location and Accessibility

The project site is situated within **Din Garh**, a peri-urban area within **District Kasur**, Punjab. The area is known for its established leather processing clusters and availability of skilled labor. The site is accessible through a network of paved roads and is connected to Kasur city and surrounding markets. Utility services such as electricity and water are available or can be extended to the site.

The location has been carefully selected to minimize environmental and social conflicts. No protected areas, sensitive ecosystems, or densely populated settlements lie within the immediate vicinity of the site. A preliminary review of land use confirms that the area is suitable for industrial development.

Screening of the Proposed Project

Screening is the preliminary and essential step in the environmental assessment process. It involves determining whether a proposed project requires an **Initial Environmental Examination (IEE)** or a more detailed **Environmental Impact Assessment (EIA)**, based on its nature, size, and potential to cause environmental impacts. Screening also identifies whether the project falls under Schedule I or Schedule II of the **Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022**.

The proposed project by **M/s Kasur Tanneries Pvt. Limited**, which entails the construction and operation of a full-fledged **leather processing facility** (from raw to finished leather), including a **chrome recovery plant** and a **wastewater treatment plant**, is inherently associated with potentially significant environmental effects. These may include effluent discharge containing hazardous chemicals such as chromium, solid waste generation, odorous emissions, and occupational risks for workers due to the handling of chemicals and biological agents.

In light of these factors, the project was evaluated against the classification criteria provided under the **Regulations of 2022**, and it clearly falls under **Schedule II**, which



mandates a full **EIA** for projects likely to have significant adverse environmental effects. Specifically, the project falls under:

- Schedule II (EIA)
- B (Manufacturing and Processing)
- Clause 10: Tannery and Leather Units

The defining characteristics that necessitate an EIA for this project include the large **daily production capacity of 100 tons**, the **use of chromium-based tanning**, the **wastewater generation of up to 1,000 m³/day**, and the **presence of a chrome recovery unit**, all of which elevate the project's environmental sensitivity.

Furthermore, the site is located within the industrial area of **Din Garh, Kasur**, an area already bearing an environmental burden from existing leather industries. As such, the cumulative environmental impacts—especially on local water bodies and soil—also justify a more comprehensive review through an EIA process.

By initiating the EIA process, the proponent has aligned with the prescribed legal and procedural framework, ensuring that environmental considerations are integrated into early project planning and decision-making.

Regulatory Framework

The proposed project is governed by a comprehensive set of environmental laws, regulations, and standards at the federal and provincial levels. These legal instruments ensure that industrial development is pursued responsibly and with due regard to the protection of natural resources, ecosystems, and public health.

The **primary legal framework** applicable to the project is the **Punjab Environmental Protection Act, 1997 (amended 2012)**. This Act mandates that no project likely to cause adverse environmental effects shall be initiated without prior approval from the **Punjab Environmental Protection Agency (EPA)**. Under this Act, the EPA has the authority to enforce environmental compliance, conduct inspections, impose penalties for violations, and revoke approvals in case of non-compliance.



The procedural requirements for conducting environmental assessments are defined in the **Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022**. These regulations lay out the criteria for project categorization (Schedule I for IEE, Schedule II for EIA), public consultation procedures, report structure, and timelines for submission and review. Since the subject project falls under Schedule II, a full EIA is mandatory prior to the commencement of construction.

The project must also comply with the **National Environmental Quality Standards (NEQS)** issued by the **Pakistan Environmental Protection Agency (Pak-EPA)**. These standards define permissible limits for effluent discharges, air emissions, and noise levels. The WWTP and CRP to be installed must ensure that effluent discharge remains within the NEQS limits for parameters such as **Biochemical Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TSS), Total Dissolved Solids (TDS), chromium, and pH**.

In addition to the above, the project must adhere to the following applicable regulations and guidelines:

- **Punjab Solid Waste Management Rules, 2015** – for the proper collection, storage, transportation, and disposal of solid and hazardous waste.
- **Punjab Occupational Safety and Health Act, 2019** – for ensuring a safe and healthy working environment for employees.
- **Punjab Local Government Act, 2019** – for site development, municipal coordination, and building approvals.

Where applicable, international standards such as the **International Finance Corporation (IFC) Performance Standards** on Environmental and Social Sustainability and the **World Bank Environmental, Health and Safety (EHS) Guidelines** will be referenced to ensure alignment with global best practices.

The project proponent is responsible for ensuring continuous regulatory compliance. Regular environmental monitoring, internal audits, and reporting to EPA Punjab will be



conducted as part of the **Environmental Management Plan (EMP)** developed in later chapters of this report.

Regulatory Compliance Status

Regulatory compliance is a cornerstone of environmental governance and sustainability. It ensures that industrial projects are designed, constructed, and operated in a manner that meets established environmental, social, and safety standards. **M/s Kasur Tanneries Pvt. Limited**, as the proponent of the proposed leather processing project, has proactively initiated the EIA process in strict accordance with the **Punjab Environmental Protection Act, 1997 (amended 2012)** and the **Punjab Environmental Protection (Review of IEE and EIA) Regulations, 2022**.

The proponent has formally submitted the necessary documentation required for EIA, including the Letter of Intent, project layout plans, process flow diagrams, technical specifications of pollution control equipment, baseline environmental data, and authorization letter for the consultant. Furthermore, the project design has incorporated pollution mitigation infrastructure at the conceptual stage. For instance, a **Chrome Recovery Plant (CRP)** has been included to recover and recycle chromium from the tanning process, reducing hazardous load in the effluent. Likewise, the **Wastewater Treatment Plant (WWTP)** has been designed with a daily capacity of **1,000 cubic meters**, ensuring compliance with the **National Environmental Quality Standards (NEQS)**.

The site selection also reflects compliance with zoning and land use regulations. The project is located in an industrial area in **Din Garh, District Kasur**, which is consistent with the land-use classification for industrial activities. The site is not located in or near any environmentally sensitive areas such as wetlands, protected forests, or archaeological zones, and it complies with local development planning frameworks.

In addition to environmental regulations, the proponent is committed to adhering to other relevant legal and administrative frameworks, including the Punjab Occupational



Safety and Health Act, Punjab Local Government Building Codes, Boiler and Pressure Vessels Rules, and Punjab Solid Waste Management Rules. The company will secure necessary clearances from other regulatory bodies such as the Punjab Industrial Estates Development and Management Company (PIEDMC), LDA/ TMA, and labor and health departments as required.

To ensure ongoing compliance, the project will implement a **comprehensive Environmental Management Plan (EMP)** and will carry out **periodic environmental monitoring** as detailed in later chapters. Data on air emissions, water quality, solid waste generation, and noise levels will be collected and analyzed. These results will be reported to **Punjab EPA** and made available for third-party audits when necessary. Compliance registers will be maintained on site to document routine inspections, staff training records, equipment servicing logs, and emergency preparedness drills.

The proponent's demonstrated commitment to preemptive compliance and environmental accountability underscores the project's alignment with both provincial and national environmental objectives. This foundation of legal and regulatory conformance will be pivotal to securing the Environmental Approval (NOC) from EPA Punjab.

Scoping of the EIA Study

Scoping is a fundamental component of the Environmental Impact Assessment (EIA) process, undertaken to define the breadth, priorities, and methodology of the environmental investigation. It involves identifying the environmental and social aspects most likely to be affected by the proposed project and helps guide the collection of relevant baseline data, impact analysis, and mitigation planning. Through scoping, significant concerns from stakeholders are integrated into the study's structure, ensuring the EIA remains focused and inclusive.

Spatial and Temporal Boundaries

The spatial boundaries of this EIA encompass both the immediate project site and its surrounding area of influence. A five-kilometer radius around the project site located in



Din Garh, District Kasur, was identified as the area of influence. Within this buffer zone are agricultural lands, human settlements, water bodies, and other industrial facilities that could potentially be impacted by the project's operations. Environmental and social receptors within this zone were selected for baseline monitoring and impact evaluation.

The temporal boundaries of the EIA cover the complete lifecycle of the project, including the pre-construction, construction, operation, and decommissioning phases. During the pre-construction phase, activities such as land preparation, clearance, and the delivery of machinery may cause temporary impacts like dust generation and noise. The construction phase involves civil works, machinery installation, and increased vehicular movement, all of which could result in both environmental disturbance and occupational risks. The operation phase, which includes the daily processing of 100 tons of leather, the use of chemicals, and the generation of industrial effluent, poses the most sustained environmental and occupational challenges. A future decommissioning phase, although not imminent, has also been considered from an environmental risk perspective to ensure that any future closure is conducted in a safe and sustainable manner.

Stakeholder Consultation and Concerns Raised

Stakeholder engagement was conducted during the scoping process to ensure that local concerns and suggestions were integrated into the EIA framework. Consultations were held with residents living near the project site, particularly in Din Garh and nearby villages, as well as with local farmers, landowners, labor groups, and representatives from the Tehsil Municipal Administration (TMA) Kasur.

The stakeholders expressed a number of concerns about the potential environmental and social impacts of the proposed project. A key issue raised was the risk of contamination of surface and groundwater resources due to chemical discharges from tanning operations. Stakeholders also voiced worries about air pollution and unpleasant odors that may arise from the breakdown of organic matter and chemical reactions during processing. Noise and dust generation during construction were highlighted as short-term disturbances that might affect their daily lives.



Concerns were also shared regarding possible long-term impacts on agricultural productivity due to contamination or soil degradation. However, some participants acknowledged the potential benefits of the project, especially in terms of employment generation for local laborers and economic stimulation in the area. There was a shared expectation that the project would prioritize local hiring and that any infrastructure damaged during construction, such as roads, would be repaired by the proponent.

Identification of Significant Environmental and Social Impacts

Based on the issues identified during consultations and the technical screening of project activities, a number of potentially significant impacts have been identified for detailed assessment in the subsequent chapters of this report. Environmental impacts include degradation of water quality due to the discharge of effluents that may contain hazardous compounds such as chromium, sulfides, and organic matter. Soil contamination from the disposal of sludge and solid waste was identified as a concern, particularly if waste management protocols are not rigorously followed. The release of air pollutants and odorous substances from chemical use and leather drying processes could affect both the immediate and surrounding environments.

Noise generated by construction machinery, mechanical processes, and utility equipment could contribute to local discomfort and hearing risks for workers. Occupational health and safety concerns include direct exposure of workers to hazardous substances, such as chromium salts and acids, physical injuries from machinery, and other risks associated with confined spaces and heat stress in processing units. Socially, the project is expected to generate employment opportunities, especially during construction and operation. However, it may also exert pressure on local infrastructure such as roads, housing, and utility services due to labor in-migration or the establishment of temporary labor camps.

These identified issues will be thoroughly analyzed in terms of their magnitude, duration, frequency, and reversibility. Their significance will be determined using established assessment criteria. Based on these findings, the EIA will propose practical and achievable mitigation measures along with monitoring strategies. These will be



consolidated into the Environmental Management Plan to ensure the implementation of effective safeguards throughout the life of the project.

Chapter 02

Consideration of Alternatives

The consideration of alternatives is a fundamental component of the Environmental Impact Assessment (EIA) process. It ensures that the selected project option is not only technically and economically viable but also environmentally and socially responsible. Exploring alternatives allows the project proponent and stakeholders to evaluate other possible scenarios, identify the most sustainable approach, and avoid or minimize adverse impacts. For the proposed construction of a raw-to-finish leather processing unit, including a chrome recovery plant and wastewater treatment plant, a comprehensive assessment of alternatives was carried out in the domains of site selection, design and technology options, environmental performance, and economic feasibility.

2.1 Site Alternatives: Selection and Rejection Criteria

Multiple sites within District Kasur were initially explored to identify the most suitable location for the leather processing facility. The primary evaluation criteria included land use compatibility, availability of infrastructure, proximity to residential and agricultural areas, topography, environmental sensitivity, and accessibility via roads and utilities.

The selected site in Din Garh met all regulatory and technical requirements, being located in an area designated for industrial use and at a safe distance from ecologically sensitive areas and major residential clusters. Other potential sites were rejected due to their proximity to populated areas, lack of road access, or location on agriculturally productive land.

Table 7: Comparison of Site Alternatives

Criteria	Site A (Din Garh) – Selected	Site B (Rural Kasur) – Rejected	Site C (Suburban Edge) – Rejected
Proximity to Industrial Area	Within industrial zone	Isolated agricultural zone	Near residential suburb
Road Access	Adjacent to main road	Poor access road	Moderate access



Utility Availability	Available on-site	Limited availability	Available but costly
Environmental Sensitivity	Low	Medium (agricultural runoff)	High (proximity to residences)
Public Acceptability	High	Low	Low
Final Status	Selected	Rejected	Rejected

2.2 Design and Technology Alternatives: Selection and Rejection Criteria

The project involves the transformation of raw hides into finished leather using chemical tanning and processing methods. Multiple technological options were reviewed for tanning, effluent treatment, and waste handling systems.

For tanning, chromium-based processes were selected over vegetable tanning due to their higher efficiency and compatibility with available resources. However, to mitigate the environmental risks associated with chromium, a chrome recovery plant (CRP) is integrated to recover up to 90% of the chromium from wastewater for reuse.

For effluent treatment, several technologies such as trickling filters, anaerobic lagoons, and membrane bioreactors were evaluated. Ultimately, a conventional activated sludge process was selected due to its proven performance in treating high-strength tannery wastewater, local availability of expertise, and compliance with NEQS standards.

Table 8: Comparison of Tanning and Effluent Treatment Technologies

Aspect	Chromium Tanning (with CRP) – Selected	Vegetable Tanning – Rejected	Membrane Bioreactor – Rejected	Activated Sludge – Selected
Process Efficiency	High	Low	High	High
Chemical Use	Controlled with CRP	Natural agents	Moderate	Moderate
Cost of Implementation	Moderate	High (land and time intensive)	Very High	Moderate
Environmental Risk	Medium (managed with CRP)	Low	Low	Low
Technical Feasibility	High (industry standard)	Limited	High but costly	High
Final Status	Selected	Rejected	Rejected	Selected



2.3 Environmental Alternatives: Selection and Rejection Criteria

The environmental alternatives considered focused on minimizing emissions, reducing chemical loads, and managing solid and liquid waste responsibly. Options evaluated included using synthetic tanning agents, off-site wastewater treatment, and waste recycling systems.

While synthetic tanning agents were considered, they were rejected due to limited local availability and inconsistent product quality. Off-site wastewater treatment was also ruled out due to the absence of a nearby CETP (Combined Effluent Treatment Plant) with suitable capacity and chemistry compatibility. Instead, in-house treatment with chromium recovery, air emission controls, and solid waste segregation was selected as the best environmental strategy.

The preferred environmental approach integrates pollution prevention, process optimization, and end-of-pipe treatment to ensure full compliance with NEQS and EPA Punjab guidelines.

Table 9: Evaluation of Environmental Alternatives

Option	Selection Criteria	Status	Remarks
Synthetic Tanning Agents	Low chemical risk, poor quality control	Rejected	Inconsistent output, higher cost
Off-site Wastewater Treatment	Centralized solution, lack of local CETPs	Rejected	No viable facility nearby
In-house WWTP + CRP + APC Measures	High control, full compliance potential	Selected	Cost-effective and environmentally sound
Landfill Disposal for Solid Waste	Standard practice, regulated by EPA	Selected	Through registered hazardous waste contractors

2.4 Economic Alternatives: Selection and Rejection Criteria

The economic viability of the proposed project is a critical consideration that balances financial sustainability with environmental responsibility. An evaluation of economic



alternatives was undertaken to determine the most cost-effective configuration for the proposed leather processing facility, which includes chrome recovery and wastewater treatment units. This evaluation focused on determining the optimal production scale, levels of technological automation, and long-term cost efficiencies while ensuring compliance with environmental regulations.

The selection criteria included initial capital investment, life-cycle operational costs, market demand alignment, energy efficiency, and the capacity to incorporate environmental safeguards without incurring prohibitive expenses. Each economic alternative was assessed not only on the basis of financial metrics but also for its environmental and operational feasibility.

2.4.1 Small-Scale Pilot Plant

A small-scale pilot plant was initially considered to test the feasibility of leather production on a limited scale (e.g., less than 25 tons/day). This option involved minimal capital investment and lower operational risk in the early stages. However, the per-unit cost of production was found to be significantly higher, due to limited economies of scale and higher raw material and energy costs per unit. The pilot facility would also have limited capacity to integrate high-efficiency effluent treatment and chrome recovery systems, making regulatory compliance more difficult and expensive over time.

Furthermore, the small-scale operation would not be sufficient to meet projected market demands or support consistent exports. From an economic standpoint, this model was not viable beyond initial testing or research and development purposes.

2.4.2 High-Automation Large-Scale Facility

At the opposite end of the spectrum, a fully automated large-scale facility with a production capacity exceeding 200 tons/day was also considered. This model featured advanced process automation, computerized controls, and energy-efficient systems, which could offer high production throughput and long-term operational savings.



However, the initial capital investment required for such a facility was extremely high, including costs for imported machinery, automation infrastructure, and specialized engineering. Additionally, such a facility would demand a highly skilled workforce for operations and maintenance, which may not be readily available in the region, increasing dependence on external technical support and training.

This alternative also posed increased environmental risks due to higher input volumes, potentially leading to larger quantities of effluents and solid waste. While treatment capacity could be scaled up accordingly, the environmental risk and regulatory burden also increase with scale. In the context of the local economic environment and available market size, this alternative was found to be financially overambitious and operationally complex.

2.4.3 Mid-Scale Facility with Environmental Controls (Selected Option)

After evaluating the trade-offs, a mid-sized facility with a production capacity of 100 tons/day was selected as the most economically and environmentally balanced option. This configuration allows the proponent to benefit from economies of scale while keeping capital and operational costs within a manageable range.

This model includes key environmental control components such as an on-site chrome recovery plant and a wastewater treatment plant with a 1,000 m³/day capacity, ensuring full compliance with NEQS and EPA Punjab regulations. The system also integrates energy-efficient pumps, dosing systems, and reuse of treated water for non-potable applications (e.g., washing floors, plantation), thereby reducing recurring costs on raw materials and utilities.

The selected model ensures profitability through stable production volumes and market responsiveness while maintaining sustainability. Additionally, by investing in localized but reliable technology instead of high-end imported equipment, the proponent achieves a balance between modern performance and economic feasibility.

2.4.4 Comparative Summary

The comparative economic analysis of the alternatives is summarized below:



Table 10: Economic Comparison of Project Alternatives

Alternative	Capital Cost	Operating Cost per Unit	Environmental Compliance	Market Demand Alignment	Skilled Labor Requirement	Status
Small-Scale Pilot Plant	Low	High	Difficult to ensure	Poor	Low	Rejected
High-Automation Large-Scale Plant	Very High	Low	High	High	Very High	Rejected
Mid-Scale Facility with CRP & WWTP	Moderate	Moderate	High	Adequate	Moderate	Selected

2.4.5 Long-Term Economic Viability

The selected economic model not only provides an optimal investment-to-output ratio but also contributes to local economic development through job creation and industrial integration. The choice to incorporate chrome recovery and water reuse practices reflects long-term cost savings by minimizing raw material waste and reducing water procurement costs. The proponent has also structured the project to accommodate future expansion if market demand grows, without disrupting the environmental systems already in place.

This phased and scalable economic strategy aligns with best practices in sustainable industrial development and positions the facility to operate as a competitive and compliant enterprise in Pakistan's leather sector.

Chapter 03

Description of the project

3.1 Objectives of the Project

The proposed project by **M/s Kasur Tanneries Pvt. Limited** aims to establish a modern, integrated leather processing facility equipped with chrome recovery and wastewater treatment plants. The core objective is to process raw hides into finished leather using environmentally responsible technologies, thereby contributing to the industrial growth of the region while ensuring compliance with national environmental quality standards. The facility is designed not only to meet domestic and international market demands but also to operate within the framework of sustainable industrial development. The initiative aligns with the Punjab Government's policy to promote value-added exports and reduce the environmental footprint of the leather tanning industry, which has historically been a major contributor to industrial pollution in Kasur.

The specific objectives of the project include the following:

- Establish a fully integrated **raw-to-finish leather processing unit** with a production capacity of **100 metric tons per day**.
- Incorporate a **chrome recovery plant (CRP)** with a capacity of **100 m³/day** to reclaim chromium from spent tanning liquor, reducing hazardous waste.
- Install a **wastewater treatment plant (WWTP)** with a treatment capacity of **1,000 m³/day** to ensure full compliance with NEQS and minimize the project's impact on surface and groundwater resources.
- Promote **environmentally sustainable leather manufacturing** by adopting cleaner production technologies and implementing pollution prevention strategies.
- Create **employment opportunities** for skilled and unskilled labor in the region, contributing to local economic uplift.



- Contribute to the **export competitiveness** of Pakistan’s leather sector by producing high-quality, environmentally compliant leather for global markets.

The alignment of environmental and economic objectives is summarized below:

Table 11: Summary of Project Objectives

Objective Type	Description
Environmental	Reduce pollution load through CRP and WWTP
	Ensure compliance with NEQS and EPA Punjab regulations
	Minimize solid and liquid waste generation
	Improve air and water quality through process control and green buffers
Economic	Establish a high-capacity production facility (100 TPD)
	Enhance export competitiveness through high-quality leather production
	Achieve cost efficiency through resource recovery and water reuse
Social/Developmental	Generate local employment opportunities
	Promote industrial growth in District Kasur
	Contribute to infrastructure development in the industrial zone

These objectives form the foundation of the project design and implementation strategy and will guide its performance indicators during both construction and operational phases. By balancing profitability with sustainability, the proponent aims to establish a model facility that demonstrates responsible leather production practices in Pakistan.

3.2 Location and Site Layout of the Project

The proposed leather processing facility by M/s Kasur Tanneries Pvt. Limited is to be established in **Din Garh**, located in **District Kasur**, Punjab. This region is historically recognized for its concentration of tanneries and related industries, making it an ideal location for establishing a leather processing unit. The site is situated within an emerging industrial zone, which ensures compatibility with surrounding land uses and reduces the risk of social conflict due to industrial activity. The site was selected based on a combination of environmental, logistical, and regulatory factors, including



accessibility, topography, proximity to utilities, and distance from residential and ecologically sensitive areas.

The site layout has been strategically designed to promote efficient workflow, environmental safety, and regulatory compliance. The project area includes designated spaces for raw material handling, processing units, chemical storage, waste treatment facilities, finished goods storage, administrative offices, and green buffers. This zoning within the site minimizes risks associated with cross-contamination, optimizes internal logistics, and enhances worker safety. The layout also ensures separation between clean and contaminated flows, an essential requirement for industrial hygiene and pollution prevention.

To facilitate effective project implementation and long-term operation, the site layout considers natural topography, drainage paths, and prevailing wind directions. Environmental infrastructure such as the **wastewater treatment plant (WWTP)** and **chrome recovery plant (CRP)** are located in a downstream zone of the facility to ensure safe collection and discharge of effluents. Internal roads are designed to allow easy movement of raw materials, chemicals, and finished leather products with adequate space for truck turning radii and loading/unloading operations.

Key features of the project location and site layout include:

- The site is located in **Din Garh**, within a designated **industrial cluster of District Kasur**, minimizing land use conflicts and ensuring regulatory compatibility.
- It is situated away from dense residential areas, with **no schools, hospitals, or protected ecological zones** within the immediate 1 km buffer.
- The layout includes **segregated zones** for raw material storage, leather processing, chemical warehousing, and administrative functions, ensuring **workflow efficiency and safety**.



- The **WWTP and CRP** are located at the **lowest elevation** of the site, allowing for **gravity-based wastewater flow** and easy maintenance access.
- **Green buffer zones and landscaped areas** are incorporated along the site perimeter to serve as noise and dust barriers while improving the site's visual impact.
- Provision for **future expansion** has been accommodated by leaving a reserve area adjacent to the main production block.

The comprehensive and environmentally informed layout ensures that the project is capable of operating safely and efficiently while maintaining compliance with the environmental and urban planning regulations of the Punjab Government. The layout plan will be included in the annexures of this report in the form of a detailed site map showing all zones and facility boundaries.

3.3 Land Use on the Site

The total land area allocated for the project is approximately **x** acres (the specific figure can be updated based on final maps). The land use within the site is optimized to accommodate industrial operations while ensuring adequate space for utilities, services, and environmental buffers. A significant portion of the site is dedicated to the main processing block, which houses the leather treatment lines and associated machinery. Adjacent to this block are areas for chemical storage and raw material handling, designed with safety containment measures and impermeable flooring to prevent soil contamination. Open spaces and green areas are integrated around the perimeter and within the site to help mitigate heat effects and reduce airborne pollutants. Land has also been allocated for internal roads, employee amenities, security infrastructure, and effluent treatment systems. The selected site was previously unused agricultural or barren land, and its conversion into industrial use has been undertaken in accordance with the zoning regulations of the Punjab Government. The project has been designed to ensure optimal land utilization with minimal disruption to surrounding land uses.



3.4 Road Access

The project site is well-connected to the local and regional road network, offering convenient access for the transportation of raw materials and finished goods. A metalled road connects the project directly to the Kasur city bypass and the main Kasur-Lahore Road, allowing smooth logistical operations. The approach road is capable of handling medium to heavy traffic, including trucks and container vehicles, which will be used for the import of hides and export of finished leather. The road connectivity also ensures that construction materials, equipment, and utilities can be transported efficiently during the implementation phase. Internal roads within the facility are paved and dimensioned to support two-way movement of industrial vehicles, ensuring operational efficiency and safety.

3.5 Vegetation Features of the Site

The vegetation on the project site was sparse prior to development, consisting primarily of wild grasses and low-lying shrubs typical of semi-arid regions. No significant tree cover or ecologically sensitive flora were observed during the baseline ecological assessment. The site does not support any rare, threatened, or endangered plant species, and it is not designated as a protected natural area. Following site preparation, all vegetation was cleared in accordance with environmental guidelines and after obtaining necessary approvals. The site development plan includes a green belt along the boundary and designated green patches within the industrial zone. These will be planted with indigenous, drought-resistant species such as neem, sukhi chain, and amaltas, which not only contribute to aesthetics but also help control dust and improve air quality. Landscaping activities will be implemented in phases, coordinated with the construction schedule and environmental management plan.

3.6 Cost and Magnitude of Operation

The total estimated cost of the project is approximately **PKR 650 million**. This includes civil construction, procurement and installation of machinery, utility connections, environmental control systems, and contingency expenses. The facility is designed to process up to 100 metric tons of raw hides per day, producing a variety of finished



leather types including chrome-tanned and dyed leather for footwear, garments, and upholstery industries. The magnitude of operation positions the facility as a major producer in the regional leather market, with scope for future expansion. Chrome recovery and wastewater treatment systems are sized accordingly to handle high-volume flows, ensuring regulatory compliance at full operational capacity. The facility will operate in multiple shifts with a workforce of skilled and unskilled labor, supported by technical and managerial personnel.

3.7 Schedule of Implementation

The project is scheduled to be implemented over a 12-month timeline. The first quarter will involve land development, boundary wall construction, and installation of basic infrastructure such as electricity and water supply. During the second quarter, civil works for the main production block and auxiliary buildings will be completed, along with procurement of processing equipment. The third quarter will focus on mechanical and electrical installations, commissioning of the chrome recovery plant and wastewater treatment plant, and workforce recruitment and training. The final quarter will involve testing, trial runs, and initial production. Full commercial operations are expected to commence by the end of the 12th month. Environmental monitoring during the construction phase will be carried out continuously, and all mitigation measures outlined in the Environmental Management Plan (EMP) will be implemented in parallel.

3.8 Description of the Project

The proposed facility is a vertically integrated leather processing plant designed to convert raw hides into finished leather under one roof. The processing chain includes soaking, liming, dehairing, fleshing, splitting, pickling, tanning (primarily chromium tanning), dyeing, fat liquoring, drying, and finishing. Modern drum tanning machines, fleshing machines, sammying machines, toggle dryers, and polishing units will be installed to support the core production activities. The facility will include temperature-controlled zones to maintain product quality and prevent chemical degradation. All process areas will be ventilated and equipped with chemical handling safety systems.



The chrome recovery plant will be located adjacent to the tanning section and will include storage tanks, filtration units, and recirculation lines to recover chromium from used tanning baths. The recovered chromium will be reused in the tanning process, significantly reducing hazardous waste generation.

The wastewater treatment plant is designed with a capacity of 1,000 m³/day. It includes equalization tanks, primary screening, chemical coagulation, biological treatment, and sludge dewatering units. Treated water will meet NEQS standards and may be reused for internal purposes such as floor washing and gardening.

In addition, the project includes solid waste management facilities, chemical storage areas with containment systems, administrative offices, staff amenities, firefighting systems, and a centralized control room for operations monitoring.

3.9 Restoration and Rehabilitation Plans

Restoration and rehabilitation plans are integral components of any environmentally responsible industrial project, particularly one involving potentially polluting activities such as leather processing. For the proposed facility by M/s Kasur Tanneries Pvt. Limited, restoration and rehabilitation strategies have been developed in line with the **Punjab Environmental Protection Act, 1997 (amended 2012)** and the **Punjab Environmental Quality Standards (PEQS)**. These plans are designed to ensure that all temporary disturbances caused by construction activities are effectively mitigated, and that the project site remains environmentally stable and aesthetically functional during and after project completion.

During the **construction phase**, temporary environmental disturbances are expected, including land clearing, soil displacement, noise emissions, dust generation, and minor vegetation loss. To address these, the project proponent will implement progressive rehabilitation measures, including:

- Backfilling and leveling of excavated areas using inert construction materials.



- Removal of construction debris and proper disposal at designated waste disposal sites authorized by local municipal authorities.
- Re-contouring of disturbed land surfaces to promote natural drainage and prevent waterlogging or erosion.
- Application of water sprays on unpaved surfaces and material stockpiles to reduce dust emissions.
- Temporary planting of fast-growing ground cover species to stabilize exposed soil areas until final landscaping is implemented.

Upon completion of construction and commencement of operations, **long-term restoration measures** will be implemented to ensure that the site contributes positively to the surrounding environment. These include:

- Development of green belts and landscaped buffer zones using **indigenous, drought-resistant species** such as neem, sukhi chain, kikar, and amalbas, which are suitable for the semi-arid climate of Kasur.
- Plantation of vegetation along internal roads, boundary walls, and open spaces to reduce heat buildup, filter airborne particulates, and improve aesthetic appeal.
- Installation of **stormwater drainage channels** lined with vegetation or permeable materials to manage runoff and reduce erosion.
- Use of treated water from the wastewater treatment plant for landscape irrigation, minimizing freshwater use and promoting circular resource utilization.

In case of **accidental spills or environmental damage**, the project's Environmental Management Plan (EMP) includes site-specific protocols for remediation. Contaminated soils will be removed or treated in situ using bioremediation techniques where applicable, and damaged vegetative cover will be restored through replanting



programs. Regular environmental monitoring will ensure that any such incidents are quickly identified and addressed.

In the **event of project closure or decommissioning**, a formal decommissioning and site rehabilitation plan will be activated. This plan includes:

- Safe dismantling of machinery and removal of hazardous materials in accordance with national hazardous waste handling rules.
- Decontamination of chemical storage and effluent treatment areas.
- Dismantling or securing of structures to eliminate future safety hazards.
- Re-vegetation of the site or conversion to other approved land uses (e.g., open space, future industrial reuse).
- Submission of a final environmental audit to EPA Punjab to confirm site stabilization and closure compliance.

To monitor the effectiveness of these restoration and rehabilitation plans, the project proponent will establish a **Restoration Monitoring Committee** during the construction phase. This body will be responsible for verifying restoration milestones, ensuring compliance with environmental approvals, and addressing community concerns related to post-construction recovery.

In conclusion, the restoration and rehabilitation framework adopted by M/s Kasur Tanneries Pvt. Limited ensures that environmental integrity is maintained throughout the project lifecycle—from pre-construction through post-decommissioning. This approach not only fulfills legal obligations but also reflects the proponent's commitment to sustainable industrial development.

3.10 Rainwater Harvesting System Design and Integration

1. Introduction

Rainwater harvesting (RWH) is a sustainable water management strategy that collects and stores rainwater from rooftops and paved surfaces for later use. In light of



increasing water scarcity and declining groundwater levels in Punjab, **M/s Kasur Tanneries Pvt. Limited** has committed to integrating a **rainwater harvesting system** into the project's infrastructure. This initiative is part of the proponent's environmental stewardship strategy and aligns with the principles of resource conservation, stormwater management, and long-term sustainability. Given the substantial roof area of the production units and administrative buildings, and the presence of open paved surfaces, the site is well-suited for efficient rainwater capture and storage.

2. System Components and Technical Design

The rainwater harvesting system is designed to collect runoff from built structures, filter it to remove impurities, and store it in tanks for non-potable use. It consists of the following components:

- **Catchment Areas:** The roofs of the production halls, storage sheds, and office blocks serve as the primary rainwater collection zones.
- **Conveyance System:** Rainwater is channeled through a network of **PVC gutters and downpipes** to filtration chambers. These are designed with appropriate slopes to avoid stagnation.
- **Filtration Chambers:** Each downpipe is connected to a multi-layer filtration unit consisting of coarse gravel, sand, and activated charcoal. This setup effectively removes debris, dust, and suspended particles before storage.
- **Storage Tanks:** Filtered rainwater is stored in **underground reinforced concrete tanks** with a cumulative capacity of approximately **60,000–70,000 liters**. These tanks are sealed to prevent contamination and mosquito breeding.
- **Overflow System and Recharge Wells:** Excess water from the storage tanks during peak rainfall will be diverted to **percolation pits or recharge wells** to facilitate natural groundwater replenishment. These recharge structures are lined with gravel and sand filters to prevent sedimentation.



The system is designed to collect and utilize up to **80% of annual rainfall runoff** generated on-site, based on average annual precipitation for Kasur.

3. Usage and Environmental Benefits

The primary uses of the harvested rainwater are **non-potable**, ensuring safe and efficient water reuse within the industrial facility. These include:

- Irrigation of green belts, landscaped areas, and buffer zones
- Floor washing and non-critical cleaning activities within the plant
- Cooling tower top-up or machinery cleaning, where appropriate

These uses help offset freshwater demand and contribute to cost savings and water conservation.

Environmentally, the rainwater harvesting system offers several benefits:

- Reduces pressure on groundwater resources, which are under increasing stress in the region
- Mitigates localized flooding and erosion by controlling stormwater runoff
- Enhances groundwater recharge through controlled percolation
- Improves microclimatic conditions and supports plantation efforts on-site

Utilization Plan

The harvested rainwater will be distributed through a gravity-fed pipeline system from storage tanks to designated usage points. A basic water balance model has been developed to ensure optimum use and routing of excess water for aquifer recharge.

Table: Estimated Rainwater Utilization Plan

Application Area	Daily Requirement (Liters)	Water Source
Landscaping & Plantation	12,000	Rainwater Harvesting



Floor & Machinery Washing	8,000	Rainwater Harvesting
Recharge/Overflow	Variable	Rainwater Overflow
Total Use	~20,000	Stored Rainwater

This utilization ensures that stored rainwater is fully consumed during the dry months and that excess water during the monsoon is sustainably managed.

Environmental Impact

The integration of rainwater harvesting into the facility's infrastructure is expected to have **positive environmental impacts** with no associated adverse effects. The reduction in groundwater abstraction supports aquifer sustainability, while controlled drainage minimizes the risk of soil erosion and sedimentation. By enhancing stormwater retention, the system also reduces the potential for downstream waterlogging and infrastructure stress during heavy rainfall events.

Furthermore, the use of rainwater in landscaping and non-process operations reduces the dependency on piped or pumped water supplies, aligning with water-use efficiency goals under the **Sustainable Development Goals (SDG 6 – Clean Water and Sanitation)**.

4. Maintenance and Monitoring

To ensure reliable system performance, a scheduled maintenance plan will be followed. Key actions include:

- Quarterly inspection and cleaning of catchment surfaces, gutters, and downpipes
- Biannual replacement of filter media in filtration chambers
- Monthly tank inspections to check for sediment accumulation and water quality
- Pre-monsoon inspection of recharge pits and overflow mechanisms



A maintenance log will be maintained on-site as part of the broader Environmental Monitoring Plan (EMP). Visual inspections during and after rain events will be conducted to ensure proper functioning.

5. Compliance and Best Practice Alignment

The design and operational model of the rainwater harvesting system comply with:

- Pakistan Building Code provisions for stormwater management
- Punjab Local Government environmental guidelines
- EPA Punjab's directives on sustainable water use in industrial zones

It also aligns with international best practices for green industrial development and Integrated Water Resource Management (IWRM) as promoted by UNEP and the World Bank. The system demonstrates the project proponent's proactive approach to sustainable infrastructure and environmental leadership.

Chapter 04

Description of the Environment

Understanding the existing environmental conditions is essential for assessing the potential impacts of the proposed leather processing project and developing mitigation strategies. This chapter presents the baseline description of the physical, ecological, and socioeconomic environment of the project site located in **Din Garh, District Kasur**. The information is based on field surveys, secondary data sources, stakeholder consultations, and laboratory testing of environmental parameters. The environmental setting has been described to establish a reference for evaluating changes due to project activities.

4.1 Baseline Physical Environment

The project site lies within the alluvial plains of Punjab, a region characterized by flat topography, moderately fertile soil, and arid to semi-arid climatic conditions. The **climate** is typical of the Punjab region, with hot summers (May–July), mild winters (December–February), and a monsoon season from July to September. The **average annual temperature** ranges between **10°C in winter to 45°C in summer**, and **annual rainfall averages 400–500 mm**, primarily during monsoon months.

The **air quality** in the project area was assessed through monitoring of PM₁₀, PM_{2.5}, SO₂, NO_x, and CO levels. Ambient air quality is moderately affected due to existing industrial activities and traffic emissions but remains within **NEQS (National Environmental Quality Standards)** limits in the project's immediate vicinity. Noise levels at daytime ranged between **55–62 dB(A)**, which complies with NEQS for industrial areas.

Soil samples collected from various points at the site indicated sandy-loam texture, moderate fertility, and neutral pH levels. No heavy metal contamination was detected, indicating that the land is suitable for industrial use.



Groundwater analysis showed the water table at a depth of 25–30 feet. Laboratory testing of bore samples revealed **Total Dissolved Solids (TDS)** levels of approximately 900 mg/L, and pH levels ranging from 6.8 to 7.2. The quality of groundwater is acceptable for industrial processes with minor treatment and suitable for irrigation purposes post-treatment.

Table 12: Summary of Physical Baseline Indicators

Parameter	Observed Value Range	NEQS/Standard	Compliance Status
Temperature	10°C – 45°C	30°C – 45°C	Within Limit
Rainfall	400–500 mm/year	300–500 mm/year	Within Limit
PM ₁₀	35 µg/m ³	35 µg/m ³ (24h avg.)	Within Limit
PM _{2.5}	60 µg/m ³	150 µg/m ³ (24h avg.)	Within Limit
SO ₂	16 ppb	80 ppb	Within Limit
Noise Level (Day)	55–62 dB(A)	75 dB(A) (industrial)	Within Limit
Soil pH	6.9–7.2	6.5–8.5 (ideal)	Suitable
Groundwater TDS	850–950 mg/L	<1,000 mg/L (industrial)	Suitable (with treatment)

4.2 Baseline Ecological Environment

The ecological assessment of the project site and its surroundings reveals that the area falls within the **semi-arid plains of central Punjab**, which have experienced considerable anthropogenic modification. Due to historical and ongoing industrial activity in Kasur—especially in leather tanning—the natural ecosystems in this region have been significantly altered. The site itself is currently devoid of any sensitive or protected ecosystems and is mostly characterized by **degraded natural vegetation, open land, and sparse tree cover**.

During field surveys, no rare, endangered, or threatened species were identified. The flora consists primarily of **xerophytic and ruderal plant species** that have adapted to the arid environment and periodic disturbance. The fauna is relatively limited in diversity, consisting mostly of **common species of birds, rodents, and domesticated animals**. No migratory bird routes, nesting habitats, or ecologically critical sites such



as wetlands or forest reserves were recorded within a 5-kilometer buffer zone around the project site.

Despite the degraded status of the ecology, the proposed project includes plans for **developing green belts and buffer plantations** that will improve local habitat conditions over time and provide refuge for small wildlife species. The introduction of native tree and shrub species will serve to offset ecological losses and enhance biodiversity potential in the long term.

Table 13: Summary of Existing Flora at the Project Site

Common Name	Scientific Name	Type	Conservation Status
Doob Grass	<i>Cynodon dactylon</i>	Ground Cover	Least Concern
Aak	<i>Calotropis procera</i>	Shrub	Least Concern
Kikar	<i>Acacia nilotica</i>	Tree	Least Concern
Amaltas	<i>Cassia fistula</i>	Tree	Least Concern
Mesquite (Prosopis)	<i>Prosopis juliflora</i>	Invasive Shrub	Invasive (non-native)

Table 14: Summary of Observed Fauna in and around the Project Site

Common Name	Scientific Name	Type	Observed Frequency
House Sparrow	<i>Passer domesticus</i>	Bird	Common
Common Myna	<i>Acridotheres tristis</i>	Bird	Common
Indian Kite	<i>Milvus migrans</i>	Bird of Prey	Occasionally Observed
Field Rat	<i>Rattus rattus</i>	Rodent	Frequent
Indian Hare	<i>Lepus nigricollis</i>	Mammal	Occasionally Observed
Domestic Goat	<i>Capra aegagrus hircus</i>	Livestock	Very Common

The project does not intersect with any **protected ecological zones, wildlife habitats, or natural water bodies**, thereby ensuring minimal ecological disruption. Furthermore, the establishment of a **plantation management plan** will support ecological restoration of the disturbed area, including stormwater detention ponds, shaded corridors, and biodiversity-supportive landscaping.

4.3 Baseline Socioeconomic Environment

The proposed project is situated in **Din Garh**, District Kasur, which has a mixed rural-industrial character. Kasur is a key leather production hub of Pakistan and is home to



hundreds of small and medium-sized tanning units. The baseline socioeconomic profile is characterized by **moderate literacy**, **agrarian livelihoods**, and a growing dependence on industrial employment.

According to local surveys and secondary data, the majority of households in the surrounding villages rely on **daily wage labor**, **tanning-related employment**, **agriculture**, and **livestock farming**. Basic infrastructure such as **paved roads**, **electricity**, and **water supply** is present in the area, although access to **education**, **sanitation**, and **healthcare** services remains limited in peripheral settlements.

The local community views the proposed project with cautious optimism. During public consultations, residents expressed concerns related to past experiences with pollution from tanneries, particularly water contamination. However, they also acknowledged the need for job creation and appreciated the commitment of M/s Kasur Tanneries to install **state-of-the-art pollution control systems**, including a **wastewater treatment plant (WWTP)** and **chrome recovery plant (CRP)**.

Table 15: Socioeconomic Profile of the Project Area

Parameter	Value/Description
Population Density	Moderate (approx. 400–500 persons/km ²)
Primary Occupations	Tanning labor, agriculture, livestock, daily wages
Literacy Rate	Approximately 55%
Nearest Health Facility	Basic Health Unit (within 2 km), District Hospital (10 km)
Access to Education	Government primary schools and one private academy
Sanitation and Drinking Water	Underground water supply available, no sewerage system
Availability of Electricity	Yes, but with occasional outages
Local Industries	Leather tanneries, agriculture-related businesses
Public Perception of the Project	Supportive, conditional on environmental safeguards

M/s Kasur Tanneries has committed to generating **local employment opportunities** during both the construction and operational phases. The project will employ



approximately **150–200 workers** during construction and **100–120 during routine operations**, with preference given to local labor. Additionally, vocational training and worker safety programs will be implemented, enhancing community capacity and technical skills in the region.

The project is expected to contribute significantly to **local economic development, infrastructure improvement, and regional industrial growth**, provided that environmental safeguards are strictly observed and community engagement remains a core operational value.

4.4 Laboratory Reports

Laboratory tests were conducted to establish baseline levels for key environmental parameters. These tests were carried out by an **EPA-certified laboratory** and covered:

- **Air Quality** (PM₁₀, PM_{2.5}, SO₂, NO_x, CO)
- **Noise Levels**
- **Soil Properties** (pH, texture, heavy metals)
- **Groundwater Quality** (pH, TDS, hardness, biological contamination)

All samples were within NEQS limits for industrial development zones, indicating that the site is suitable for the planned activities. Complete laboratory reports, sampling locations, and test certificates are attached in **Annexure IV** of this EIA report.

4.5 Site Suitability

Based on topographical, environmental, and socio-economic assessments, the site is deemed highly suitable for industrial development. The absence of environmentally sensitive receptors, availability of flat and developable land, and accessibility to transportation and utility infrastructure make it an ideal location for the project.

Furthermore, the site falls within a **designated industrial area**, where land use is consistent with the proposed leather processing operations. Ground conditions are



stable, and water and electricity supply lines are either present or can be extended without significant environmental disruption.

The location also minimizes potential conflict with local residents and complies with EPA Punjab's siting criteria for Schedule II (EIA) projects.

Conclusion

The environmental baseline study indicates that the project site is **free from critical environmental constraints** such as endangered habitats, groundwater vulnerability, or protected land uses. The air and water quality, ecological profile, and socio-economic indicators support the feasibility of the project from an environmental and social standpoint. Anticipated impacts can be managed through strict implementation of the proposed **Environmental Management Plan (EMP)**.

Flora and Fauna

The flora and fauna within the project zone are characteristic of **semi-arid agro-industrial zones**, with limited biodiversity due to ongoing land use changes. No endangered or protected species were identified. The project will incorporate **green belts, tree plantations, and landscaping** as compensatory ecological measures, using local species that are drought-resistant and fast-growing. These efforts will improve air quality, support biodiversity, and enhance the visual quality of the site over time.

Chapter 05

Impact Assessment

5.1. Methodologies for Impact Identification

5.1.1 Baseline Data Collection

Baseline data collection is critical to understanding the existing environmental conditions before project implementation. This ensures accurate impact prediction and helps design appropriate mitigation measures. The following key parameters were studied:

5.1.2 Meteorological Data

Meteorological conditions influence pollutant dispersion and water usage. Data was collected for:

- Temperature: Average, seasonal variations.
- Rainfall: Annual precipitation, monsoon patterns.
- Wind speed and direction: To assess air pollutant dispersal.

5.1.3 Ambient Air Quality

Air quality monitoring was conducted at three locations near the project site:

- Particulate Matter (PM₁₀, PM_{2.5}): From vehicular and industrial sources.
- Gaseous Pollutants (SO₂, NO_x): Emissions from fuel combustion.
- Hydrogen Sulfide (H₂S): Expected from tannery operations.

Table 16: Baseline Air Quality Data

Parameter	Location 1 (µg/m ³)	Location 2 (µg/m ³)	Location 3 (µg/m ³)	Permissible Limit (NEQS)
PM ₁₀	85	92	78	150 µg/m ³
SO ₂	12	15	10	120 µg/m ³



NO~x~	25	30	22	80 µg/m ³
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5.1.4 Groundwater Quality

Samples were collected from bore wells within a 2 km radius to assess:

- pH, Total Dissolved Solids (TDS)
- Heavy Metals (Cr, Pb, Cd)
- Chlorides & Sulfates (indicators of contamination).

Table 17: Groundwater Quality Baseline

Parameter	Sample 1	Sample 2	Sample 3	WHO Standard
pH	7.2	7.5	6.9	6.5–8.5
TDS (mg/L)	850	920	780	1000 mg/L
Chromium (Cr) (mg/L)	0.05	0.08	0.03	0.05 mg/L

5.2 Predictive Tools for Impact Assessment

To systematically evaluate impacts, the following methodologies were applied:

5.2.1 Leopold Matrix

A cross-matrix was developed to correlate project activities with potential impacts.

Table 18: Leopold Matrix for Key Activities

Project Activity	Impact on Air	Impact on Water	Impact on Soil	Mitigation Measure
Effluent Discharge	–	High (BOD, Cr)	Medium (Leaching)	WWTP, Chrome Recovery
Chemical Storage	Low (VOCs)	–	High (Spills)	Spill containment
Machinery Operation	Medium (Dust)	–	–	Dust suppression

Checklist Method

Used to ensure compliance with Schedule I & II of environmental regulations. Key findings:

- Schedule I: Applies due to industrial wastewater discharge.
- Schedule II: Requires an EIA (not just IEE) for large-scale tanneries.



5.2.2 Stakeholder Consultations

- Local Communities: Expressed concerns about water scarcity.
- Regulatory Bodies: Emphasized zero liquid discharge (ZLD) compliance.

5.2.3 Life Cycle Assessment (LCA)

The project's impacts were analyzed across three phases:

Construction Phase

- Land Disturbance: 6 Kanal and 5 marlas site preparation.
- Dust Emissions: Controlled via water sprinkling.
- Labor Influx: Temporary (~50 workers).

Table 19: Construction Phase Impacts

Impact	Magnitude	Duration	Mitigation
Dust Generation	Moderate	Short-term	Water spraying, windbreaks
Noise Pollution	Low	Temporary	Restricted work timings

Operational Phase

- Water Use: 1000 m³/day (recycled where possible).
- Waste Generation: 100 tons/day leather scraps (sold to recycling units).

Decommissioning Phase

- Site Restoration: Soil remediation if contaminated.
- Waste Disposal: Safe disposal of chromium sludge.

Checklists

Checklists were developed to ensure comprehensive coverage of potential environmental impacts. These lists prompted consideration of various environmental parameters related to construction, operation, and decommissioning phases.

Environmental Impact Checklist for M/s Kasur Tanneries (Private) Limited's Project



Environmental Aspect	Considerations	Potential Impact (Yes/No)
Air Quality	Emissions from construction equipment	Yes
	Emissions from extraction processes	Yes
	Dust generation during construction	Yes
Water Resources	Water usage for extraction processes	Yes
	Potential contamination of local water bodies	Yes
Soil Quality	Soil disturbance during construction	Yes
	Potential contamination from waste disposal	Yes
Biodiversity	Impact on local flora and fauna	Yes
	Habitat disruption during construction	Yes
Noise Pollution	Noise from construction activities	Yes
	Operational noise from machinery	Yes
Socioeconomic Factors	Job creation in local communities	Yes
	Changes in local economic conditions	Yes

5.3. Characteristics of Impacts

The proposed leather processing unit will have a range of environmental and socio-economic impacts, varying in magnitude, duration, and reversibility. Understanding these characteristics is essential for designing effective mitigation strategies and ensuring sustainable project implementation.

5.3.1 Key Environmental Impacts

Water Pollution



The discharge of tannery effluents—containing chromium, sulfides, and organic pollutants—poses a significant risk to local water bodies. Without proper treatment, these contaminants could degrade groundwater quality and harm aquatic ecosystems. The proposed Wastewater Treatment Plant (WWTP) (1000 m³/day capacity) and chrome recovery system (100 m³/day) are critical mitigation measures. However, long-term monitoring will be necessary to ensure compliance with National Environmental Quality Standards (NEQS).

Air Emissions

The tanning process releases volatile organic compounds (VOCs), hydrogen sulfide (H₂S), and particulate matter (PM). While scrubbers and enclosed processing units will reduce emissions, seasonal variations in wind patterns may influence local air quality. Baseline data indicates that current pollutant levels are below NEQS limits, but operational emissions must be strictly controlled to prevent exceedances.

Soil Contamination

Improper handling of chemicals (e.g., chromium salts, acids) could lead to soil contamination through spills or leaching. The project includes impermeable flooring, spill containment systems, and regular soil testing to minimize risks. Contaminated soil, if detected, will undergo remediation before decommissioning.

Noise Pollution

Machinery operations during construction and production will generate noise, particularly in the project’s initial phases. While the impact is temporary, acoustic barriers and restricted work timings will mitigate disturbances to nearby settlements.

Table 20: Summary of Key Environmental Impacts

Impact Category	Source	Magnitude	Duration	Mitigation Measures
Water Pollution	Effluent discharge (Cr, BOD)	High	Long-term	WWTP, chrome recovery, zero



				liquid discharge (ZLD)
Air Emissions	VOCs, H ₂ S, PM	Moderate	Continuous	Scrubbers, enclosed units, stack monitoring
Soil Contamination	Chemical spills, leaching	Low-Moderate	Reversible	Impermeable flooring, spill containment
Noise Pollution	Machinery operations	Low	Short-term (construction)	Acoustic barriers, restricted hours

5.3.2 Socio-Economic Impacts

Positive Impacts

The project is expected to generate ~200 direct and indirect jobs, boosting local employment and skill development. Additionally, the tannery's integration into the leather supply chain will stimulate ancillary businesses (e.g., transport, packaging), contributing to regional economic growth.

Negative Impacts

- **Temporary Displacement:** Construction may disrupt nearby residents, though no permanent relocation is required.
- **Increased Traffic:** Raw material transport could strain local roads, necessitating traffic management plans.
- **Resource Competition:** Water demand (1000 m³/day) may stress local supplies, requiring sustainable sourcing agreements.

Table 21: Socio-Economic Impact Assessment

Impact Type	Description	Significance	Management Strategy
Employment	200 jobs (skilled/unskilled)	High (+)	Priority hiring for locals, training
Traffic	Increased vehicle movement	Moderate (-)	Dedicated transport routes, off-peak hours



Water Use	Groundwater extraction (1000 m ³ /day)	High (–)	Rainwater harvesting, recycling
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5.3.3 Cumulative Impacts

The project's interaction with existing tanneries in Kasur could exacerbate regional environmental stresses:

- **Groundwater Depletion:** Multiple industries extracting water may lower aquifer levels.
- **Pollution Load:** Combined effluent discharge risks overwhelming natural degradation capacity.
- **Land Use Changes:** Industrial clustering may reduce agricultural land availability.

Mitigation Strategies:

- **Collective Effluent Treatment:** Advocate for a shared industrial WWTP.
- **Water Audits:** Mandate periodic assessments for sustainable usage.
- **Stakeholder Collaboration:** Engage with other industries to align sustainability goals.

Conclusion

The impact assessment reveals that while the project poses environmental risks (notably water and air pollution), proposed mitigation measures—such as the WWTP, chrome recovery, and emission controls—can effectively manage these impacts. Socio-economic benefits, particularly job creation, outweigh short-term disruptions, provided robust monitoring and community engagement are maintained. Cumulative impacts require regional cooperation to ensure long-term sustainability.

Chapter 06

Environmental Management and Monitoring Program (EMMP)

6.1 Introduction

6.1.1 Purpose of the EMMP

The Environmental Management and Monitoring Program (EMMP) is designed to systematically minimize, mitigate, and monitor the environmental and social impacts of the proposed leather processing unit. It ensures compliance with national regulations (e.g., NEQS, Pakistan Environmental Protection Act) and international best practices.

Key Objectives

1. Mitigate adverse impacts (air, water, soil, noise).
2. Monitor compliance with regulatory standards.
3. Enhance sustainability through adaptive management.
4. Engage stakeholders (communities, regulators) for transparency.

6.1.2 Phases of the EMMP

Table 22: Different Phases of EMP

Phase	Activities
Pre-construction	Baseline monitoring, EMP finalization, contractor training.
Construction	Dust/noise control, spill prevention, labor camp management.
Operation	Effluent treatment, air emission monitoring, waste recycling.
Decommissioning	Site restoration, hazardous waste disposal, post-closure monitoring.



6.1.3 Dynamic and Adaptive Approach

The EMMP will be reviewed quarterly to incorporate new data, stakeholder feedback, and technological advancements. Corrective actions will be implemented if monitoring identifies deviations.

6.2 Description of Proposed Mitigation Actions

6.2.1 Mitigation for Air Quality Impacts

Sources: VOC emissions (tanning), PM (machinery), H₂S (chemical processing).

Measures:

- Scrubbers & Filters: Installed on exhaust stacks to capture particulate matter and gases.
- Enclosed Processing Units: Minimize fugitive emissions.
- Real-Time Air Quality Sensors: Monitor PM_{2.5}, PM₁₀, SO₂, NO_x at facility boundaries.

Table 23: Air Quality Mitigation Plan

Parameter	Control Technology	Monitoring Frequency	Performance Target
PM ₁₀	Baghouse filters	Continuous	< 150 µg/m ³ (NEQS)
H ₂ S	Chemical scrubbers	Weekly	< 5 ppm (OSHA)
VOCs	Activated carbon adsorption	Monthly	< 20 mg/m ³ (EPA standards)

6.3 Schedule for Implementation

Table 24: EMMP Implementation Timeline

Activity	Responsible Party	Start	Completion
Install WWTP	Kasur Tanneries Pvt. Ltd	Month 1	Month 6



Air quality sensors setup	Environmental Consultant	Month 2	Month 3
First stakeholder workshop	Project Manager	Month 4	Month 4
Baseline groundwater testing	Third-party lab	Month 1	Month 2

6.4 Environmental Management Team (EMT) and Responsibilities

Core Team:

1. Environmental Manager (Overall EMP compliance).
2. EHS Officer (Daily monitoring, incident reporting).
3. Process Engineer (Optimize resource use).
4. Community Liaison Officer (Stakeholder engagement).

Table 25: Environmental Management Team (EMT) Roles and Responsibilities

Role	Key Responsibilities	Authority	Reporting Frequency	Key Performance Indicators (KPIs)
Environmental Manager	- Oversee EMP implementation and compliance with regulations.	- Approve mitigation measures. - Halt non-compliant activities.	Monthly	- 100% EMP adherence. - Timely submission of audit reports.
	- Review monitoring data and audit reports.			
	- Liaise with regulatory bodies (e.g., EPA).			



EHS Officer	- Conduct daily site inspections (spills, emissions, waste handling).	- Issue corrective action notices. - Conduct worker training.	Weekly	- Zero unresolved violations. - 100% worker training completion.
	- Maintain incident logs and emergency response plans.			
Process Engineer	- Optimize water/chemical use to reduce waste.	- Modify processes to meet environmental targets.	Bi-weekly	- 10% annual reduction in resource use. - Zero process deviations.
	- Ensure chrome recovery plant operates at >90% efficiency.			
Community Liaison Officer	- Address grievances from local communities.	-Organize stakeholder consultations.	Monthly	- 100% grievance resolution within 30 days. - Quarterly public meetings held.
	- Disseminate EMP updates in local languages.			
Third-Party Auditor	- Verify EMP effectiveness through independent audits.	- Recommend EMP upgrades. - Validate monitoring data.	Quarterly	- 100% audit completion on schedule. - No major non-conformities.



6.5 Proposed Monitoring Program

6.5.1 Monitoring Parameters

- Air: PM, SO₂, NO_x, H₂S.
- Water: pH, BOD, Cr levels, TDS.
- Noise: dB levels at facility boundary.

6.5.2 Performance Indicators

Table 26: Key Performance Indicators (KPIs)

KPI	Target	Measurement Method
Effluent Cr < 1 mg/L	100% compliance	Lab analysis (daily)
Air emissions within NEQS	95% of readings	Continuous sensors
Zero chemical spills	100% prevention	Incident logs

6.6 EMP Reporting and Review Procedures

1. Monthly Reports: Summarize monitoring data, incidents, corrective actions.
2. Quarterly Audits: Independent review by third-party consultants.
3. Annual Review: Update EMP based on performance, new regulations.

The EMMP provides a structured, enforceable framework to ensure environmental sustainability. With clear mitigation measures, monitoring protocols, and accountability mechanisms, the project aims to balance industrial growth with ecological protection



Table 27: Environmental Management and Monitoring Plan (EMMP) for Kasur Tanneries

Environmental Aspect	Mitigation Measure/Management Action	Monitoring Parameter	Monitoring Frequency	Responsible Party	Reporting
Air Quality	<ul style="list-style-type: none"> - Use recycled tannery water for dust suppression. - Install scrubbers for chemical fume control. 	<ul style="list-style-type: none"> - PM10, PM2.5 (PEQS: $\leq 150 \mu\text{g}/\text{m}^3$). - Chromium (Cr) aerosols in worker zones. 	<ul style="list-style-type: none"> - Construction: Weekly. - Operation: Monthly (bi-monthly near communities). 	<ul style="list-style-type: none"> - Environmental Officer - CETP Operator 	<ul style="list-style-type: none"> - Internal monthly report. - Annual audit shared with Punjab EPA.
Water Quality	<ul style="list-style-type: none"> - Install CETP with chromium recovery. - Recycle 60%+ process water via reverse osmosis. 	<ul style="list-style-type: none"> - BOD, COD, TSS, pH (PEQS). - Total chromium ($\leq 0.05 \text{ mg}/\text{L}$) in discharge. 	<ul style="list-style-type: none"> - Construction: Monthly. - Operation: Weekly (effluent); Monthly (groundwater). 	<ul style="list-style-type: none"> - Water Treatment Operator - Third-party Lab 	<ul style="list-style-type: none"> - Monthly effluent reports to EPA. - Public disclosure of groundwater data.



Environmental Aspect	Mitigation Measure/Management Action	Monitoring Parameter	Monitoring Frequency	Responsible Party	Reporting
Noise Pollution	<ul style="list-style-type: none">- Install noise barriers around machinery.- Ban nighttime construction near residential zones.	<ul style="list-style-type: none">- Noise levels (≤ 75 dB daytime; ≤ 65 dB nighttime, PEQS).	<ul style="list-style-type: none">- Construction: Weekly.- Operation: Monthly.	<ul style="list-style-type: none">- Site Supervisor- Environmental Consultant	<ul style="list-style-type: none">- Internal monthly report.- Community grievance logs.
Waste Management	<ul style="list-style-type: none">- Segregate chromium sludge; store in lined landfills.- Sell biodegradable waste to farmers.	<ul style="list-style-type: none">- Chromium sludge volume.- Waste recycling rate.	<ul style="list-style-type: none">- Construction: Weekly.- Operation: Daily (hazardous waste).	<ul style="list-style-type: none">- Waste Management Team- Hazardous Waste Contractor	<ul style="list-style-type: none">- Quarterly hazardous waste disposal certificates.- Annual audit.
Soil Quality	<ul style="list-style-type: none">- Use impermeable liners under chemical storage.- Remediate	<ul style="list-style-type: none">- Soil Cr levels (≤ 40 mg/kg, WHO).	<ul style="list-style-type: none">- Construction: Monthly.- Operation: Annually.	<ul style="list-style-type: none">- Soil Scientist-	<ul style="list-style-type: none">- Annual soil quality report shared with communities.



Environmental Aspect	Mitigation Measure/Management Action	Monitoring Parameter	Monitoring Frequency	Responsible Party	Reporting
	chromium-contaminated soil.	- pH, organic matter.		Environmental Officer	
Ecosystem & Biodiversity	<ul style="list-style-type: none"> - Preserve existing trees (e.g., Sheesham). - Plant Neem trees as green buffers. 	<ul style="list-style-type: none"> - Flora/fauna diversity in 1km radius. - Tree survival rate. 	<ul style="list-style-type: none"> - Pre-construction: Baseline survey. - Post-construction: Annually. 	<ul style="list-style-type: none"> - Environmental Consultant - NGO Partner 	<ul style="list-style-type: none"> - Biodiversity impact assessment report.
Health & Safety	<ul style="list-style-type: none"> - Mandate PPE (gloves, masks, boots). - Quarterly health screenings for chromium exposure. 	<ul style="list-style-type: none"> - Worker blood chromium levels. - Accident frequency. 	<ul style="list-style-type: none"> - Construction: Daily (safety checks). - Operation: Monthly. 	<ul style="list-style-type: none"> - Health Officer - Occupational Safety Advisor 	<ul style="list-style-type: none"> - Monthly health reports. - Incident logs shared with labor department.



Environmental Aspect	Mitigation Measure/Management Action	Monitoring Parameter	Monitoring Frequency	Responsible Party	Reporting
Energy Consumption	<ul style="list-style-type: none">- Shift to biogas from tannery waste.- Install solar panels for non-process energy.	<ul style="list-style-type: none">- Energy use (kWh/ton leather).- % renewable energy.	<ul style="list-style-type: none">- Construction: Monthly.- Operation: Quarterly.	<ul style="list-style-type: none">- Energy Manager- Sustainability Officer	<ul style="list-style-type: none">- Annual carbon footprint report.
Chemical Handling	<ul style="list-style-type: none">- Label chromium chemicals per GHS.- Train workers in spill response.	<ul style="list-style-type: none">- Chemical spill incidents.- Inventory of Cr-based chemicals.	<ul style="list-style-type: none">- Construction: Monthly.- Operation: Weekly.	<ul style="list-style-type: none">- Safety Officer- CETP Supervisor	<ul style="list-style-type: none">- Spill incident reports to EPA within 24 hours.
Traffic & Transportation	<ul style="list-style-type: none">- Designate truck routes away from schools.- Enforce speed	<ul style="list-style-type: none">- Traffic congestion.- Vehicle emission	<ul style="list-style-type: none">- Construction: Monthly.- Operation: Quarterly.	<ul style="list-style-type: none">- Traffic Manager- Local Police Liaison	<ul style="list-style-type: none">- Quarterly traffic impact report.



Environmental Aspect	Mitigation Measure/Management Action	Monitoring Parameter	Monitoring Frequency	Responsible Party	Reporting
	limits (20 km/h near communities).	levels (PEQS).			
Community Engagement	<ul style="list-style-type: none">- Monthly grievance meetings.- Fund mobile health camps for skin/respiratory ailments.	<ul style="list-style-type: none">- Number of complaints.- Community participation in meetings.	<ul style="list-style-type: none">- Construction: Weekly.- Operation: Monthly.	<ul style="list-style-type: none">- Community Liaison Officer- CSR Manager	<ul style="list-style-type: none">- Publicly accessible grievance redressal logs.
Sustainability & CSR	<ul style="list-style-type: none">- Train locals in eco-friendly tanning.- Support community water filtration projects.	<ul style="list-style-type: none">- % of local workforce employed.- Number of community clean water initiatives.	<ul style="list-style-type: none">- Construction: Quarterly.- Operation: Annually.	<ul style="list-style-type: none">- CSR Manager- NGO Partner	<ul style="list-style-type: none">- Annual CSR report published on website.



Environmental Aspect	Mitigation Measure/Management Action	Monitoring Parameter	Monitoring Frequency	Responsible Party	Reporting
Regulatory Compliance	<ul style="list-style-type: none">- Align with Punjab EPA, NEQS, and WHO chromium standards.- Third-party audits.	<ul style="list-style-type: none">- Non-compliance incidents.- Audit results.	<ul style="list-style-type: none">- Construction: Quarterly.- Operation: Bi-annually.	<ul style="list-style-type: none">- Compliance Officer- Legal Advisor	<ul style="list-style-type: none">- Compliance certificates submitted to Punjab EPA.

Key Notes for Kasur Tanneries

1. Chromium-Centric:

- Priority on chromium monitoring in air, water, soil, and worker health.
- CETPs with chromium recovery systems mandatory for all tanneries.

2. Community Health:

- Mobile health camps and public disclosure of groundwater/soil data to rebuild trust.

3. Local Ecology:

- Use native trees (Sheesham, Neem) for erosion control and pollution absorption.

4. Reporting Transparency:



- Share critical data (effluent quality, soil tests) with communities via town halls.

5. Enforcement:

- Penalties for non-compliance with PEQS, especially chromium discharge limits.

This plan addresses Kasur's unique environmental and social challenges while aligning with Pakistan's regulatory framework.



Chapter 07

Stakeholders Consultation

Stakeholder consultation is a critical part of the Environmental Impact Assessment (EIA) process for any project. **For the proposed project by M/S Kasur Tanneries Pvt Ltd, a series of consultations were held with various stakeholders from the local community, government agencies, and other relevant groups to gather their feedback on the project's potential social, economic, and environmental impacts.** The consultations aimed to provide a platform for stakeholders to voice their concerns, suggestions, and expectations regarding the project.

7.1 Methodology of Consultation

The EIA team conducted public consultations through group meetings and individual discussions. A Comprehensive questionnaire was developed in order to conduct the survey. The primary focus was to engage local communities and gather their perspectives on the proposed construction of the facility, its potential benefits, and any concerns related to environmental impacts. The consultations targeted stakeholders including local residents, government officials, and business owners from the surrounding area. Public discussions were held at various locations near the project site, and stakeholders from local communities, educational and health institutions, shops, and other facilities were consulted. The team also made initial visits to the project site and held reconnaissance meetings to understand the local context better.

7.2 Stakeholder Identification

A three-tier approach was adopted for stakeholder identification, which considered the various levels at which stakeholders could be impacted by the project. The stakeholders were classified at the provincial level (e.g., Environmental Protection Agency (EPA), Agriculture Department, Wildlife Department), district level (e.g., local government bodies), and village level (e.g., local residents, shopkeepers, school representatives, etc.). The consultations continued throughout the project lifecycle, ensuring that feedback was integrated into the environmental management plan.



Regular engagement with these stakeholders is crucial to maintain transparency and responsiveness to their concerns.

7.3 Proponent's Environmental Management Team

M/s Kasur Tanneries Pvt Ltd management assured that all necessary mitigation measures would be implemented to minimize any potential environmental impacts during the construction and operation phases of the project. The proponent's Environmental Management Team will oversee the adoption of these measures, including maintaining the aesthetics of the area and addressing concerns related to environmental degradation.

7.4 Responsible Authority

The responsibility for overseeing the implementation of the proposed mitigation measures lies with the management of M/s Kasur Tanneries Pvt Ltd. The company is committed to adhering to all environmental regulations and ensuring that the project's impact on the surrounding community and the environment is minimized.

7.5 Other Departments and Agencies

For the impact analysis, detailed meetings were held with local community leaders, educational institutions, health facilities, and NGOs. These discussions helped identify key issues related to the project and its potential effects. All relevant concerns were incorporated into the Environmental Management Plan to ensure a holistic approach to mitigating the project's impacts.

7.6 Environmental Practitioners and Experts

The team of environmental consultants from M/s Kasur Tanneries Pvt. Ltd. conducted site visits and consultations with stakeholders from nearby villages. They gathered information on the socio-economic impacts of the project and incorporated feedback from different professionals, including local business owners, farmers, teachers, and health professionals. The consultations with women were also conducted, although some hesitated to provide personal information due to social constraints.



7.7 Affected and Wider Community

No specific community was found to be directly affected by the project within the study area. The consultations with the local population revealed a general positive response toward the project. Stakeholders emphasized that the project could bring tangible benefits, such as job creation and local development, while ensuring that mitigation measures were taken to preserve the environment.

7.8 Consultation Findings

The results from the consultation meetings with stakeholders indicate a strong overall support for the project. The local community members expressed positive feedback regarding the project's potential to bring socio-economic benefits to the area, particularly in terms of employment opportunities and business growth. Many respondents felt that the construction of the project would improve the local infrastructure, contribute to social mobility, and increase the importance of the area.

However, there were also concerns raised regarding the potential environmental impacts, especially in relation to the potential effects on the area's aesthetic value and the environment. Some participants were worried about the impact on the scenic beauty of the area, but the project proponents assured that mitigation measures, such as land reclamation and maintaining the aesthetics of the area, would be implemented to address these concerns.

7.9 Stakeholder Feedback

The responses from stakeholders, summarized below, provide a more detailed picture of their views: Sample Size **20** sample size was selected by the Team of consultants for conducting the socioeconomic survey. Women were also consulted for the said survey; some of their names are mentioned in the above list of respondents while most of them were not willing to give personal information.

7.10 Statistical Analysis

Two Different statistical software excel and SPSS have been used for the statistical

analysis of the data collected during the visit of study site villages through questionnaires.

7.11 Results and Discussion

The consultations involved 20 respondents, including both 11 male and 9 female participants.

Gender

20 responses

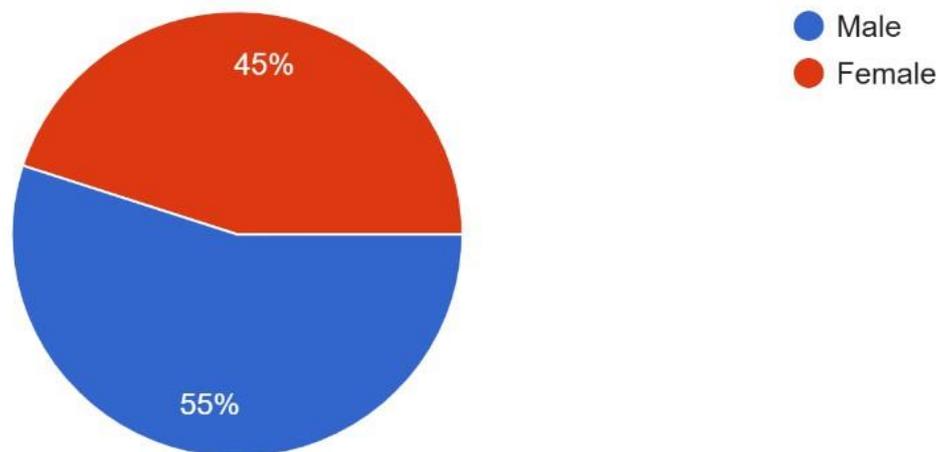


Figure 2: Gender of the Respondents

Project Support and Importance

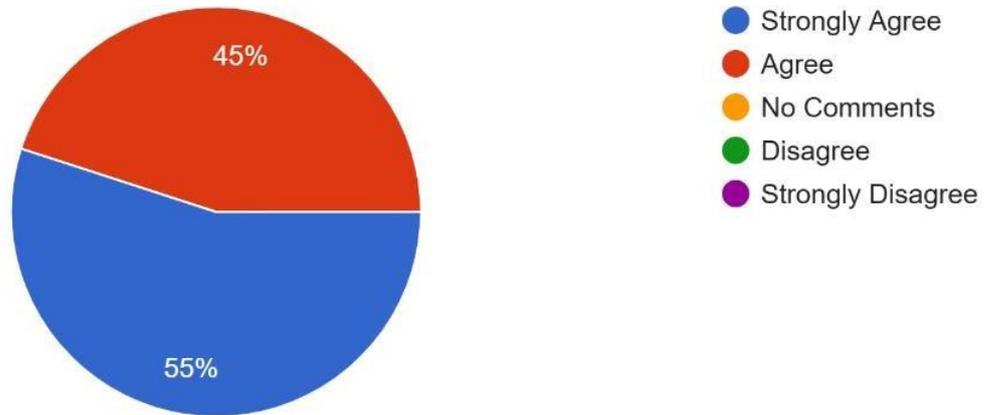
The majority of the respondents (11), both male and female, expressed strong support for the proposed project. Most (9) agreed that the construction of the facility would increase the importance of the area, contributing to its overall growth and



development. Participants were optimistic about the project's potential to raise the

Are you in favor of the proposed construction?

20 responses



profile of the local community and enhance its standing within the region. The support for the project reflected a shared belief that it would bring significant benefits to the community.



Figure 3: Respondents in favor of the Pro

Will the project increase the importance of the area?

20 responses

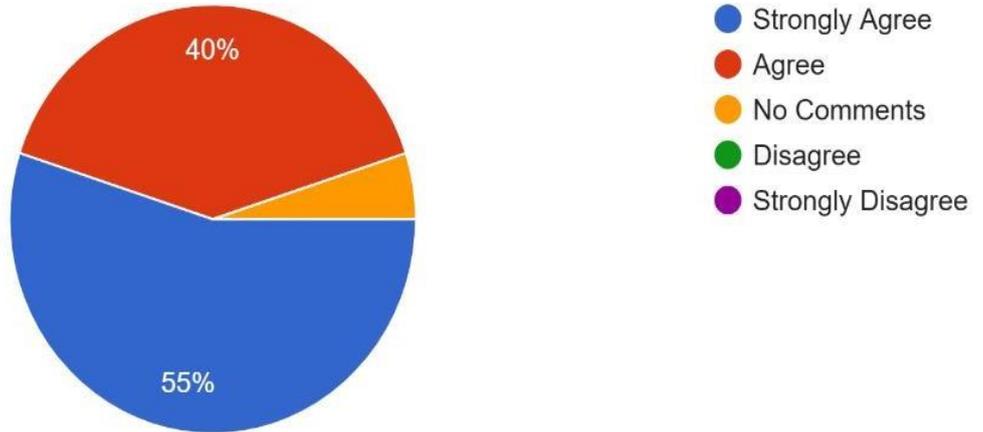




Figure 4 Respondents' Views on the Impact of the Project on the Importance of the Area

Improvement of Living Standards

While many respondents believed that the project would improve the living standards of the area, a few raised concerns. Approximately, 17 respondents strongly agreed or agreed that the project would result in better infrastructure, more employment opportunities, and improved services, which could enhance the overall quality of life. However, 3 individuals disagreed, possibly due to concerns over potential negative environmental impacts or uncertainties about the project's long-term benefits. Despite these reservations, the majority of the community seemed confident that the project would lead to better economic prospects.

Will the project help to improve the living standards of the area?

20 responses

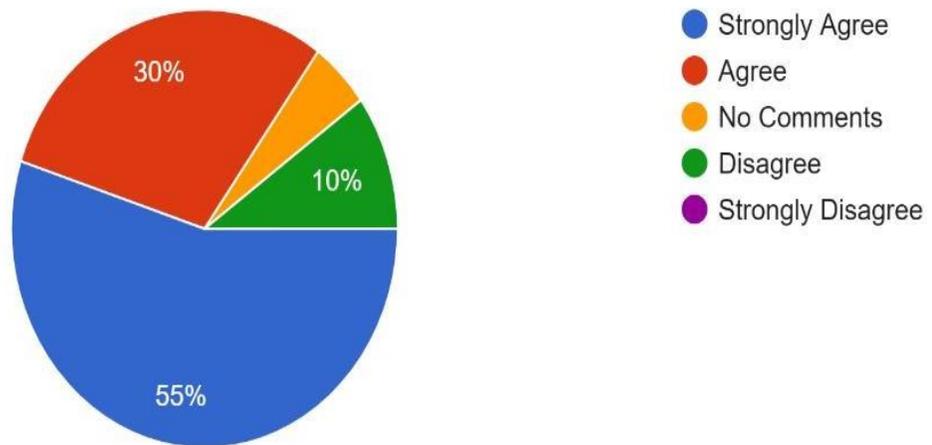


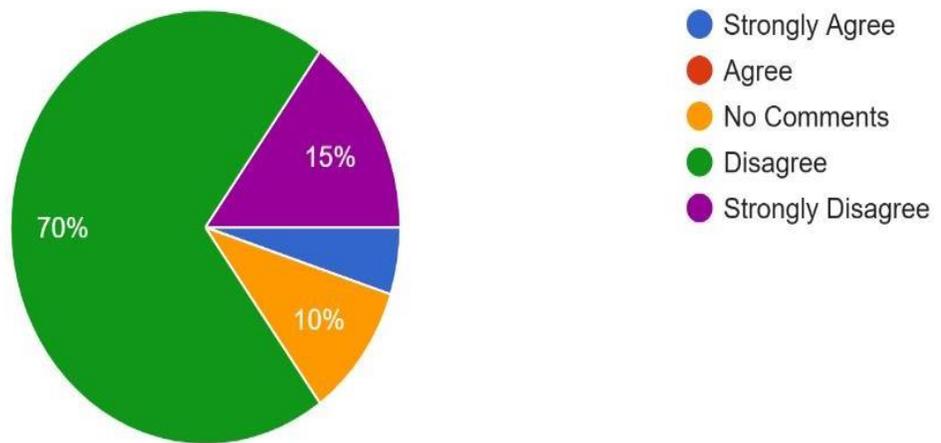
Figure 5: Respondents' Views on the Impact of the Project on the living standards of Area

Environmental Impact Concerns

When asked about the environmental impact of the project, responses were varied. 14 respondents strongly disagreed and 3 disagreed that the project would have any negative effect on the environment, 1 showed concern regarding its potential to disrupt area's

Will the project affect the environment of the area?

20 responses



aesthetic value. 2 responders were neutral and given no comments.

Figure 6: Respondents' Views on the Impact of the Project on the Environment of Area

Satisfaction with the Project

In terms of satisfaction, a substantial number of participants expressed their contentment with the project and its potential benefits. 18 respondents indicated their approval, citing



the job creation and economic growth the project would bring. Their positive outlook on the project reflected their anticipation of tangible improvements in their community. However, 2 individuals, were neutral regarding the project satisfaction.

Level of satisfaction?

20 responses

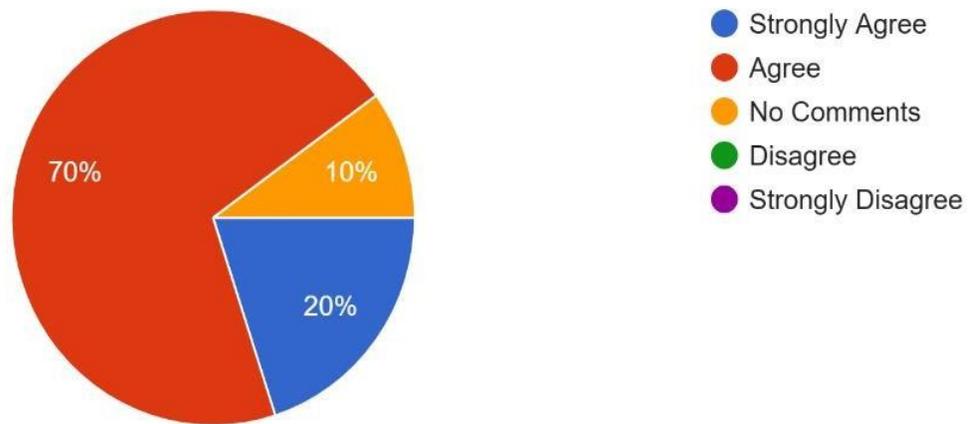


Figure 7: Respondents' Level of Satisfaction Regarding the Proposed Project

Conclusion

The stakeholder consultation process for the M/s Kasur Tanneries Pvt Ltd project demonstrated strong support for the initiative from the local community, with a clear recognition of its potential to boost the area's economic development. While environmental concerns were noted, the project proponents have committed to implementing mitigation measures to address these issues and maintain local aesthetic and environmental values. Continuous engagement with stakeholders throughout the project's lifecycle is crucial to ensure that any emerging concerns are promptly addressed.



Chapter 08

Conclusion and Recommendations

8.1 Conclusion:

The tanneries of Kasur play a pivotal role in Pakistan's economy, providing employment, sustaining livelihoods, and contributing significantly to leather exports. However, this economic boon comes at a steep environmental and social cost. The unchecked discharge of toxic effluents, laden with heavy metals like chromium, has led to severe water and soil contamination, endangering ecosystems and public health. Local communities and workers face heightened risks of respiratory ailments, skin diseases, and long-term chronic conditions due to exposure to hazardous chemicals. Despite existing environmental regulations, weak enforcement, outdated infrastructure, and reliance on unsustainable practices perpetuate these challenges. The situation underscores a critical trade-off between industrial growth and environmental stewardship, demanding urgent, multi-stakeholder intervention to reconcile economic objectives with ecological and social well-being.

8.2 Recommendations

To address these challenges, the following measures are proposed:

1. Infrastructure Modernization:

- Install centralized effluent treatment plants (CETPs) and mandate tanneries to adopt chrome recovery systems to reduce chemical waste.
- Promote water recycling technologies to minimize freshwater consumption and effluent discharge.

2. Regulatory Strengthening:

- Revise and enforce stringent effluent quality standards, aligned with international norms (e.g., WHO, EPA).
- Establish real-time monitoring systems and impose penalties for non-



compliance to ensure accountability.

3. Worker and Community Safeguards:

- Enforce occupational safety protocols, including PPE provision, regular health screenings, and training on chemical handling.
- Launch community awareness campaigns on pollution-related health risks and safe water practices.

4. Sustainable Practices Incentivization:

- Offer tax breaks, subsidies, or low-interest loans to tanneries adopting eco-friendly technologies (e.g., vegetable tanning, biodegradable chemicals).
- Encourage eco-certification (e.g., Leather Working Group) to enhance market access and premium pricing.

5. Research and Collaboration:

- Invest in R&D for cleaner production methods and circular economy models (e.g., waste-to-energy, byproduct upcycling).
- Foster public-private partnerships to pool resources for infrastructure projects and skill development programs.

6. Stakeholder Engagement:

- Engage NGOs and international agencies (e.g., UNIDO, World Bank) for technical/financial support and independent monitoring.
- Facilitate dialogue between tanneries, communities, and policymakers to build trust and collaborative solutions.

Transforming Kasur's tanneries into a sustainable industry requires balancing economic viability with environmental and social responsibility. By prioritizing innovation, regulation, and inclusive engagement, Kasur can emerge as a model for ethical leather production, ensuring prosperity for current and future generations.