2024

ENVIRONMENTAL IMPACT ASSESSMENT (EIA) OF

M/S RELIANCE WEAVING MILLS LIMITED

17-KM KHANEWAL ROAD MULTAN

Reliance Weaving Mills Limited
A Fatima Group Company

REPORT PREPARED BY

PAK GREEN ENVIRO-ENGINEERING PVT. LTD.

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Executive Summary

Title & Location of the project

Subject project for which this Environmental Impact Assessment (EIA) Study has been conducted is the proposed Construction of Knitting, Dyeing unit, and Effluent treatment plant within the existing unit of M/s Reliance Weaving Mills Limited, at 17-km Khanewal Road Multan. M/s Reliance weaving Mills Limited already obtained environmental approval for weaving vide letter No. DD (EIA)/EPA/F-79(EIA)/2020/750 dated 28-11-2023, copy is attached as **Annexure-A**. The production capacity of Dyeing will be 10 ton/day, while the ETP capacity will be 1200 Cubic Meter per day. The total area of the project for subject unit is 2 Acre. The cost of the project will be 3500-3600 million PKR.

The process at the knitting and dyeing unit begins with the reception of yarn from spinning mills. Upon arrival, the yarn undergoes meticulous inspection to ensure both quality and quantity meet the required standards. Following this, the yarn is sorted based on various parameters such as type, color, and quality specifications. Subsequently, the sorted yarn is fed into knitting machines within the knitting department, where it is transformed into knitted fabric using various techniques suited to the desired characteristics. Once knitted, the fabric proceeds to an inspection frame where it undergoes thorough scrutiny for any defects or irregularities, with defective pieces being identified for further action. The fabric is then grouped into lots in the lot making area, based on similar characteristics, and assigned unique identifiers for tracking purposes. These lots are then transferred to the dyeing department, where fabric dyeing is carried out using machines of different capacities tailored to the requirements, ensuring precise color matching and uniformity across the lots. After dyeing, the fabric undergoes rinsing and drying processes to prepare it for finishing. In the finishing department, open width fabric goes through a series of machines including slitting, stenter, raising, and compacting machines, culminating in a final quality inspection to ensure adherence to standards. Similarly, tubular width cutting involves stretching, drying, compacting, and quality inspection steps to prepare the fabric for distribution or further processing. This comprehensive process ensures the efficient production of knitted fabric that meets stringent quality and color standards, ready for use in various applications.

The proposed project component effluent treatment plant falls under Clause 3 of category F of Schedule II of Review of IEE and EIA Regulations, 2022 and project component construction of dyeing falls under clause 6 of category B of schedule. The total cost of project is 3500-3600

million approx., So, the proposed project considered as EIA. TORs of the study under clause 5 (f) of policy and procedure for the filing, review and approval of environmental assessment are annexed as ***Annexure –B***

Location

Subject proposed project is located at 17-km khanewal road Multan.

Project land coordinates are as follows: **30°15'7.98"N, 71°36'58.77"E**

North Industrial Unit

East Open land + Agriculture land

South Sub-road towards grid station

West Link road (WAPDA Road) to NH-5 (Multan Road

For further details, Google map and layout map of the proposed Dyeing and layout map of is attached as ***Annexure-C*** with the report.

Figure 1: Aerial view of the proposed project site

Name of the proponent

Name: Mr. Col ch. Abdus Sattar Sulhari

Designation: Administrator

CNIC: 33100-0895374-3

Mailing Address: Chowbara Sabz Peer Tehsil Pasroor Dstrict Sialkot

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

Name of organization preparing the report:

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

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

Contact: 042-35441444, 0303-4442335.

For detail company profile see the *Chapter # 1 "Introduction"*

A brief outline of the proposal

Name of the project:	Proposed construction of Knitting and dyeing unit, and effluent treatment plant under the name of M/s RELIANCE WEAVING MILLS LIMITED
Location of the project:	17-km khanewal road multan
Proposed Area:	Total area of the Industrial unit: 31 Acres Area for construction of subject proposed project: 2 Acres
Nature of Project:	Nature of the project is proposed construction of Dyeing unit, having capacity will be 10 ton/day, while the ETP capacity will be 1200 Cubic Meter per day. The total area of the project for subject unit is 2 Acre. The cost of the project will be 3500-3600 million PKR.
Cost of the project:	Total cost of the project will be approx. 3500-3600 million rupees.
Power Requirement:	Power requirements of the proposed project would be 1.5 Mega Watts,
Labor/ Workforce:	During construction: 150 (estimated) During Operation: 100+ (estimated)
Water Requirement:	During the constructional phase of the project approximately 3500-3600-gallon water will be required per day for constructional and

	domestic uses. During the operational phase of the project approx. During the operational phase of the project 80 gallon/day/capita will be required for domestic use and remaining will be operational phase process water, capacity of ETP would be 1200 m3/day, after treatment in ETP water will be disposed of into nearest drain, management has obtained permission letter for safe disposal of treated water into drain and copy of approval is attached as **Annexure D and** ETP technical report is attached as **Annexure E.**
Solid waste:	Approx. 200-300 kg/day constructional and domestic waste will be produced during the constructional phase of the project. During operation: 360-400 kg/day domestic and project related waste[1]l

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. Moreover, area for plantation is also reserved for air purification within the project vicinity and plants will be planted as per EPA instruction outside the project site in nearby areas.

Table: Summary of Environmental and social impacts of the project during the construction phase and mitigation measures suggested:

Potential Impact	Criteria for determining Significance	Key Mitigation Measures
Dust Emissions— Dust and PM may be generated during road construction and excavation activities. Gaseous emissions from site generators and transportation vehicles may affect ambient air quality in the vicinity of the project site.	An increase in visible dust beyond the boundaries of the construction site or Concentration of PM_{10} in excess of 150 $\mu g/m^3$ PEQS for Ambient Air	Sprinkling of water on dusty roads, tracts and surfaces is recommended; During excavation works drop heights will be minimized to control the fall of materials reducing dust escape; Use of wind shield around stockpiles is recommended; Vehicle speed restrictions should be applied in the project area; Raw materials should be transported in covered trucks;
Solid waste Management— If solid waste will not be managed properly, it may cause negative impacts	Generation of excessive waste; Recyclable waste and reusable waste is discarded, Littering, Improper disposal.	Constructional waste should be utilized for road filling and maintenance purposes; Domestic waste should be disposed off properly, handed over to contractors, placed in bins; Proper solid waste management plan should be devised and implemented.

Waste water - water used in construction process and excessive water generate as wastewater and it also produced from campsite domestic activities	PEQS parameters	Waste water after treatment should be drain out in nearby drain
Construction Noise- Noise may be generated during landscaping activities and from generators and transportation vehicles at the project site; which may be a nuisance for the workers.	OSHA standards	Activities generating high levels of noise should be minimized at the project site. If the noise level will exceed the permissible limits with reference to national and OSHA standards, following recommendations are suggested to take action against the high noise levels: • Proper tuning of construction machinery and vehicles is recommended. • Ear muffs and ear plugs are recommended in case of high noise levels. • Rubber wounds should be placed underneath the generator to avoid the vibration (in case of installation of generators)
Vegetation Loss/ Soil erosion— Minor negative impact may arise as only some weeds and grasses are present at the	Unnecessary or excessive removal of trees and shrubs.	No tree cutting/ vegetation loss issue will be involved in the subject project as project site is free of any dense vegetation and trees. Preparation of a Reinstatement Plan to restore the land after the

project site which will be cleared for the purpose of construction.		constructional activities is recommended.
Soil Contamination—Oil and Chemical spills can contaminate the soil.	Presence of visible amount of hydrocarbon in soil	Provision of spill prevention and control kits; Use of impermeable surfaces in workshops, and storage areas; Contaminated soil will be collected and incinerated.
Traffic issues- Traffic issues may arise due to the constructional activities at the project site if traffic will not be managed properly.	TEPA rules	Speed limit of 10 km/h should be maintained on the access road; Ample parking area must be allocated at the project site. Guards should be hired to manage the traffic at the project site.
Socioeconomic impacts—Inter-cultural differences between the project staff from other areas and the local community may arise due to the subject project. Positive socioeconomic impacts due to increased infrastructure, employment opportunities and economic growth.	No community complaints. Increased employment facilities in the area; Increased infrastructure	Training of the non-local project staff on local culture and norms; Avoidance of unnecessary interaction of local population with the non-local project staff. Employment opportunities should be provided to the local people.

Table 1: Summary of Major Impacts & their Proposed Mitigation during Operational Phase

Potential Impact	Criteria for determining Significance	Key Mitigation Measures
Impact due to Location	Seismic Region and flood Zone Specification	There are no significant negative impacts on the environment due to the project location/ selected site, because the project is present in existing area of already established industrial unit, having no significant impact on the surrounding industrial unit and community.
Gaseous Emissions- During the operational phase of the project, gaseous emissions from project site generator may affect the air quality of the project area.	PEQS for Ambient Air	Industry should ensure the PEQS compliance and should not be allowed to emit hazardous pollutants. Proper tuning of generator should be done to avoid the excessive gaseous emission from the generator (if Installed) Vehicle emissions inspection should be done on regular basis. Sprinkling should be done on the unpaved area to avoid dust pollution/ particulate matter.
Noise- Noise due to industrial activity, machinery and generators can be a nuisance for the workers in the working area.	OSHA Standards	Activities generating high levels of noise should be minimized at the project site. Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating equipment will be provided to the workers and other staff in case of noise at the project site.

		Proper maintenance and tuning of the vehicles should be done. Sound proof rooms should be built for generators to be installed at the project site to control the noise.
Discharge of wastewater- The discharge of untreated municipal wastewater may be a negative impact of the subject project.	PEQS for Municipal Effluents (mg/l, unless otherwise defined)	Wastewater must be treated before its discharge. Compliance of PEQS for effluents should be ensured. Monitoring should be conducted as per PEQS and reports should be submitted to EPA.
Health & Safety Issues- different constructional and operational activities at the project site may cause health and safety issues for workers if precautionary measures will not be adopted.	OSHA Standards	Proper training of workers and staff should be conducted to avoid the accidents. Use of PPEs should be implemented at workplace. First aid measures/medical facility should be provided at the project site. Safe drinking water must be provided to workers, staff, and poor people of the area. Safety signs & boards should be placed
Solid waste management- If solid waste will not be managed properly, it may cause negative impacts.	Exposure to potentially hazardous waste; Generation of excessive waste; Recyclable waste and reusable waste is discarded; Littering.	A solid waste management division should be formulated to deal with the proper disposal of solid waste, supervised by HSE Manager, SW Manager, and other related personnel

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 constructional phase 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. Record should be maintained regarding the underground water pump and consumption.

Recommendation: Environmental Monitoring data log book should be maintained by the project proponent.

CHAPTER # 1

INTRODUCTION

This Section of the report provides an overview of the rational of the Project, objective of project, requirement of the project, purpose of the report and approach adopted to conduct the Environmental Impact Assessment Study.

Purpose of the report

Environmental Impact Assessment (EIA) report is being submitted to the Environmental Protection Agency (EPA), Government of the Punjab, Lahore for the compliance of Section 12 of Punjab Environment Protection Act-1997 (Amended 2012) for obtaining No Objection Certificate (NOC) before starting the construction activity at the project site. The other relevant regulations and guidelines considered while preparing this EIA report include:

- Policy and procedures for filing, review and approval of environmental assessments.
- Guidelines for the preparation and review of environmental reports.
- Guidelines for public participation.
- Guidelines for sensitive and critical areas.
- Detailed sectoral guidelines

Various aspects like environmental, social, physical and other aspects of the project both during construction and its regular occupancy are highlighted in this EIA report. Measures necessary to be adopted to mitigate any environmental impacts on any part of the environment around are also described. All the important information is also provided as described under the format used to help decision makers, EPA Punjab in the present case, before issuing the desired Environmental Approval.

Identification of the project and proponent

The proposed project component effluent treatment plant falls under Clause 3 of category F of Schedule II of Review of IEE and EIA Regulations, 2022 and project component construction of dyeing falls under clause 6 of category B of schedule. The total cost of project is 3500-3600 million approx., So, the proposed project considered as EIA.

Proponent:

Name: Mr. Col ch. Abdus Sattar Sulhari

Designation: Administrator

CNIC: 33100-0895374-3

Mailing Address: Chowbara Sabz Peer Tehsil Pasroor District Sialkot

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

Details of Consultant

Pak Green Enviro-Engineering (Pvt.) Ltd is an independent company, who conducts IEE, EIA, EMP and other environmental investigations through its panel of environmental consultants, public participation practitioners and experienced environmental managers. The company has its own recommended instruments to check the baseline environmental data/PEQS and lab analysis facility for water, waste water priority parameters.

Contact: Pak Green Enviro-Engineering (Pvt.) Ltd.
Office No. 46-M, Gullberg III, Lahore
Tel: 042-35441444, 03034442335
Email: info@pakgreen.pk; pak.green@hotmail.com

The current study was carried out by the following professionals:

Sr. No.	Designation	Name/Qualification	Experience
1.	Chief Environmentalist/ Lead Environmental Professional	Abdul Hafeez Nasir PhD Scholar Environmental Management	Ten Years' Experience as Environmentalist
2.	Senior Environmentalist/ Environmental Professional	Iftikhar Ahmed M. Phil Environmental Sciences	Seven Years' Experience as Environmentalist
3.	Associate Environmental Professional	Sabeera Tauheed M.Phil Environmental Science, PU	4 Year experience
4.	Environmental Engineer / Author of Report	Muhammad Imran BS Environmental Engineering	2 Years' Experience
5.	Associate Environmental Professional	Nageen Quyyum BS Environmental Science, PU	2 Years' Experience

Brief description of Nature, Size and Location of Project

Subject project is the proposed construction of ETP and Knitting and dyeing unit within existing building of M/s RELIANCE WEAVING MILLS LIMITED at 17-km khanewal road Multan. Project area is industrial in nature and many other industrial units are already in process of establishment and operation in the surroundings. Total area of the proposed Dyeing unit is 2 Acre. Layout maps are attached as **ANNEXURE-C.**

Location

Subject proposed project is located at 17-km khanewal road multan.

Project land coordinates are as follows: **30°15'7.98"N, 71°36'58.77"E**

North: **Industrial Unit**

East: **Open land + Agriculture land**

South: **Sub-road towards grid station**

West: **Link road (WAPDA Road) to NH-5 (Multan Road**

For further details, layout map of the project is attached as **Annexure-C** with the report.

Figure 2: Aerial view of the proposed project site

CHAPTER # 2

DESCRIPTION OF THE PROJECT

Type and Category of the Project:

Subject project is the proposed construction of Knitting and dyeing unit, and effluent treatment plant under the name of M/s RELIANCE WEAVING MILLS LIMITED at 17-km khanewal road multan.

The proposed project component effluent treatment plant falls under Clause 3 of category F of Schedule II of Review of IEE and EIA Regulations, 2022 and project components construction of Knitting and dyeing falls under clause 6 of category B of schedule. The total cost of project is 3500-3600 million approx., So, the proposed project considered as EIA. TORs of the study under clause 5 (f) of policy and procedure for the filing, review and approval of environmental assessment are annexed as ***Annexure – B***

Project overview:

Project name	Proposed construction of Knitting and dyeing unit, and effluen treatment plant M/s Reliance Weaving Mills Limited
Proponent of project	Mr. Col ch. Abdus Sattar Sulhari
Nature of project	Extension of dyeing unit
Process adopted	Knitting, dyeing, finishing , cutting
Location of project	17-km Khanewal road, Multan
Total area of project	2 Acre

Objectives of the Project

Objectives of the proposed construction the subject project are:

- To establish the business for the proponent.
- To contribute to the national economy of the country.
- Compensate to help poverty by providing employment.

Alternative Considerations and Reasons for their Rejection:

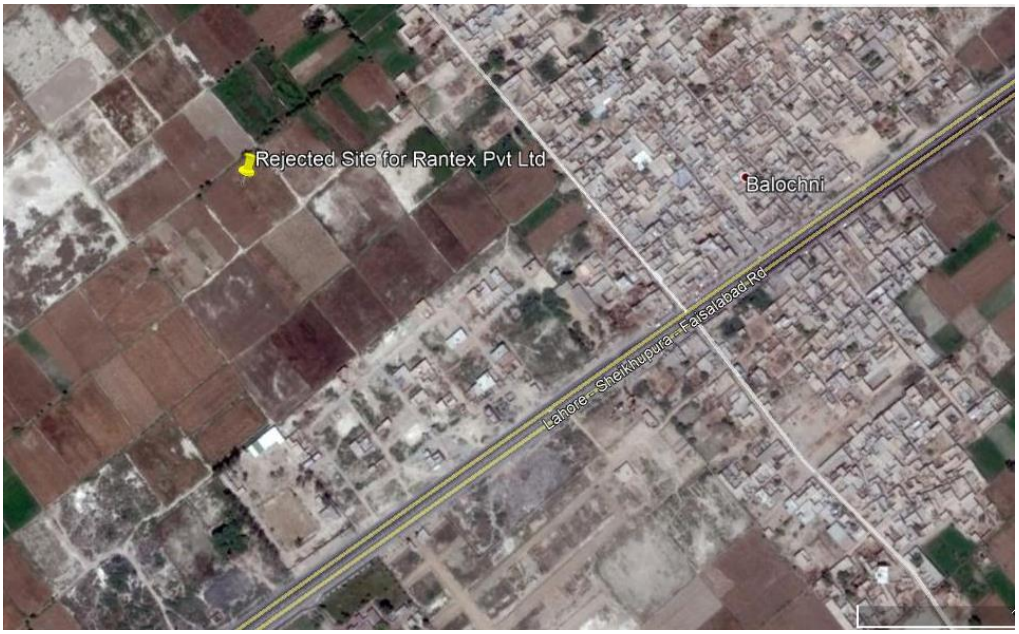
Location/Site alternatives:

To fulfill the commercial aspects of the project under reference of this EIA Report, it is to be sited at a place where commercial processing activity is either already going on or there are bright prospects of the same. Concurrently, it must also meet the legal requirements of the Punjab Environmental Protection Act, 1997 (Amended 2012). Availability of land at the best convenient place is equally important among other considerations for the site selection. Availability of access roads, communication facilities, electricity, basic infrastructure, sewerage etc. is yet the other necessary requirements.

Obviously, environmentally sound, neat and clean environment are the other considerations for site selection. The project will also facilitate the people of the area with increasing the opportunity of employment, and other related facilities.

Keeping these requirements and their feasibility and other basic infrastructural requirements, the selected site is ideally suited for Proposed construction the subject Knitting and dyeing unit, and effluent treatment plant.

Alternative Site: Near Balochni



Alternative Site: Near Chak 60RB Mogi

Figure: Alternative site considered for the subject project

Before the consideration of subject project site, project proponent had considered other sites at/ near the Chak 60 and Balochni, but later it was rejected due to some reasons.

Reasons of Rejection
The reasons of rejection of this site are:

- High cost of land
- Nearby human settlements
- Due to the ownership conflict of surrounding land
- No proper communication facility
- Fauna & Floral Species are present at this site in abundance.

Location and site layout of the project:

Subject proposed project is located at 17-km khanewal road multan. Project land coordinates are as follows: **30°15'7.98"N, 71°36'58.77"E**

North Industrial Unit

East .Open land + Agriculture land

South .Sub-road towards grid station

West .Link road (WAPDA Road) to NH-5 (Multan Road

For further details, layout map of the project is attached as ***Annexure-C*** with the report.

Figure 3: Aerial view of the proposed project site

Land Use on site

Area proposed for the construction of the subject project is an empty plot free of any activity and it is the within the existing unit of weaving. The proponent is the owner of land. Land documents are attached as **ANNEXURE-F**

Road Access

Paved road at the west side of the project area is present.

Vegetation features of the project

The construction is within the existing unit, there is no vegetation feature on site.

Cost and magnitude of the operation

Project is the proposed construction of Knitting and dyeing unit, and effluent treatment plant within existing building M/s RELIANCE WEAVING MILLS LIMITED. Total area of the proposed Dyeing unit is 2 Acre. Layout maps are attached as **ANNEXURE-C**. Total cost of the project will be approx. 3500-3600 million rupees. There are no other associated activities with regard to the subject project.

Schedule of Implementation

Detailed feasibility studies and designing of the project must be done. Necessary legal, administrative and financial formalities are being finalized. The project is expected to be completed within 11-12 months from the date of environmental approval. Subsequently the operational and maintenance aspects of the project will be undertaken by the proponent.

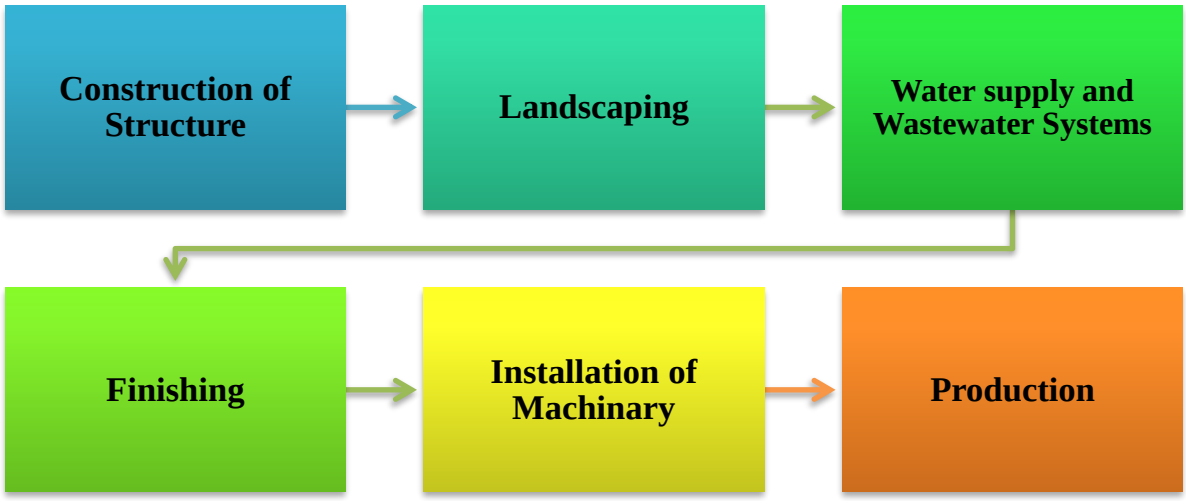


Figure 4:Schedule of implementation

Description of the project:

The project is the proposed construction of Knitting and dyeing unit, and effluent treatment plant under the name of M/s RELIANCE WEAVING MILLS LIMITED.

Yarn Receiving from Spinning Mills:

- Yarn received from spinning mills is inspected for quality and quantity.
- It is then sorted based on type, color, and quality specifications.

Knitting Department:

- Sorted yarn is fed into knitting machines where it is transformed into knitted fabric.
- Various knitting techniques are employed depending on the desired fabric characteristics.

Inspection Frame:

- The knitted fabric is passed through an inspection frame where it undergoes thorough scrutiny for any defects or irregularities.
- Defective pieces are marked for further action.

Lot Making Area:

- After inspection, the fabric is grouped into lots based on similar characteristics such as color, size, and quality.
- Each lot is assigned a unique identifier for tracking purposes.

Dyeing Department:

Fabric lots are transferred to the dyeing department where different capacities of dyeing machines are installed:

The capacity will be 10-ton/day. 9(nos.) of machine will be installed

- 2 machines of 1000 kg capacity
- 2 machines of 500 kg capacity
- 1 machine of 250 kg capacity
- 4 machines of 40 kg capacity

Fabric is dyed according to the specified color requirements for each lot.

After dyeing, the fabric undergoes rinsing and drying processes.

Finishing Department (Open Width Fabric):

For open width fabric, the following machines are utilized:

- Slitting machine: Cuts the fabric into desired widths.
- Stenter machine: Sets the fabric width and dries it evenly.
- Raising machine: Raises the fibers on the fabric surface for a softer feel.

- Compactor machine: Compacts the fabric to the desired width and thickness.
- Quality inspection: The finished fabric undergoes a final quality check to ensure it meets specified standards.

Finishing Department (Tubular Width Cutting):

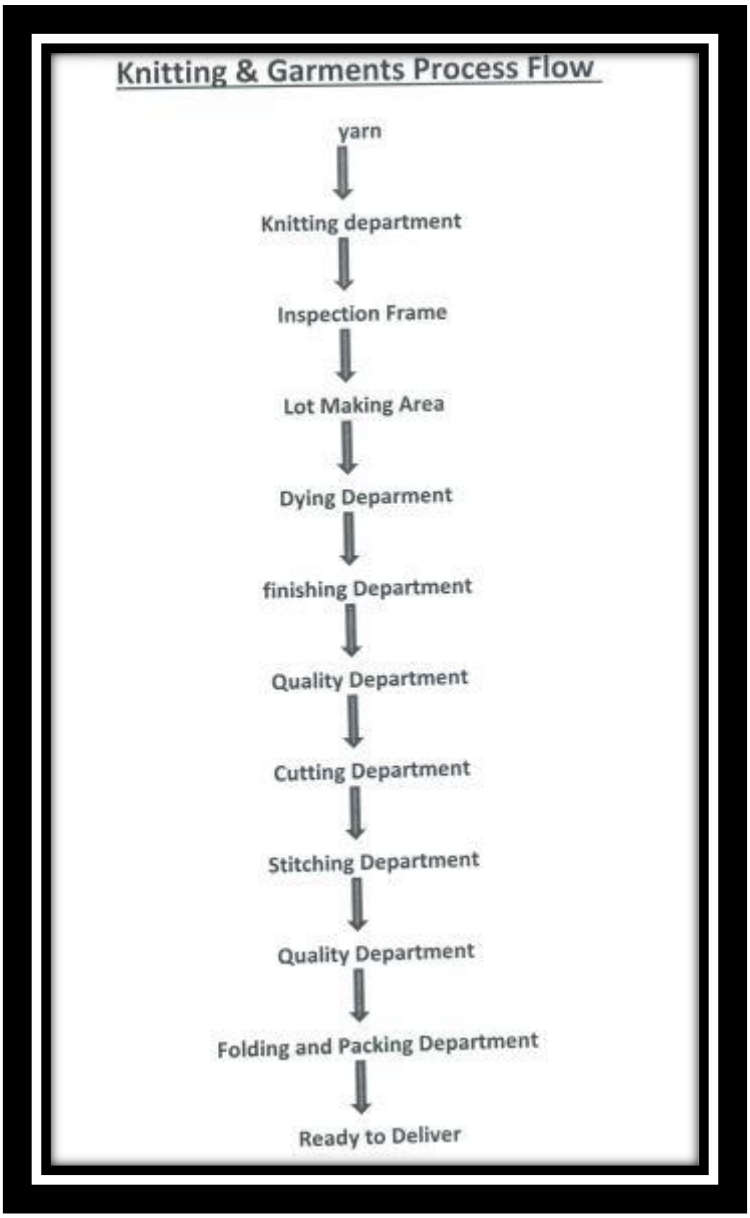
For tubular width cutting, the following machines are used:

- Stretching machine: Opens up the tubular fabric for further processing.
- Tubular dryer: Dries the stretched fabric.
- Tubular compactor: Compacts the fabric to the desired width and thickness.
- Quality inspection: The finished tubular fabric is inspected for quality and adherence to specifications.

Knitting and dyeing

Detail of Machinery and process Flow is attached as **Annexure-G**

Process Flow



INSTALLATION Of ETP:

The complete report of Wastewater treatment plant of 1200 cubic meter per day is attached as **annexure-E**

The effluent treatment plant follows a systematic process to treat wastewater before its discharge into the environment. Initially, the incoming effluent undergoes screening to remove large debris and solids, ensuring smooth operation of subsequent stages. From there, the screened effluent is pumped into a lifting tank, elevating it to a level suitable for further treatment. In the storage and homogenization tank, the effluent is stored and mixed to achieve uniformity in composition. Next, in the neutralization stage, chemicals are added to adjust the pH of the effluent, making it conducive to biological treatment. The neutralized effluent is then distributed evenly for biological oxidation, where microorganisms break down organic contaminants through aerobic processes. Following biological oxidation, the partially treated effluent enters a clarifier for solid-liquid separation. Here, suspended solids settle, and the clarified liquid is further processed. Some of the settled sludge is recycled back to the biological oxidation stage to maintain optimal microbial activity. Excess sludge collected from the clarifier is thickened to reduce its volume for further treatment or disposal. Blowers provide aeration to the biological oxidation process by supplying oxygen to microorganisms, ensuring effective treatment. Chemical reagents may be added as needed to enhance treatment efficiency or adjust parameters such as PH. Control of the entire process is managed through the main switchboard, ensuring seamless operation. Additional treatment steps, such as filtration and cooling tower usage, may be employed depending on specific treatment requirements. Throughout the process, a laboratory conducts regular monitoring and analysis to ensure compliance with regulatory standards and optimize treatment efficiency, safeguarding the environment from harmful contaminants.

Equipment List of Effluent Treatment Plant

The detail of ETP equipment is of attached **ANNEXURE-**

Water requirements:

During the constructional phase of the project approximately 3500-3600-gallon water will be required per day for constructional and domestic uses.

During the operational phase of the project 80 gallon/day/capita will be required for domestic use and remaining will be operational phase process water, capacity of ETP would be 1200 m3/day, after treatment in ETP water will be disposed of into nearest drain, management has obtained permission letter for safe disposal of treated water into drain and copy of approval is attached as **Annexure-E.**

Waste water treatment:

60-70% of the used water will be the waste water which will be treated in wastewater treatment facility. No wastewater will be disposed of into any water body prior to the treatment in treatment facility.

Wastewater Drain:

A nearby drain is present near the project site, in which wastewater will be disposed off after treatment in the wastewater treatment facility, approval for safe disposal is attached herewith. Wastewater discharge permit is attached as **ANNEXURE-D**

Solid waste:

Approx. 200-300 kg/day constructional and domestic waste will be produced during the constructional phase of the project. Constructional waste will be reused for road filling and maintenance purposes.

According to an estimate, approx. 360 kg/day domestic and project related solid waste will be produced during the operation phase of the project (based on solid waste generation rates of 0.45 kg/capita/day urban waste generation). Project related waste will include waste fabric etc. and ETP and boiler waste will include ash and sludge etc. which will be handed over to the certified contractor

Solid waste management system/practices

The Solid waste will be managed in proper way by following operations:

1. Placement of separate waste bins for domestic and project related waste in all working halls and designated points.
2. Collection of waste from all the working halls at one designated point by the sanitary workers on daily basis.
3. Careful collection of ash and sludge on regular basis and temporary storage at designated point.
4. Collection of waste from designated area and handling to the solid waste contractors for its final disposal.

Flow chart of solid waste management plan:

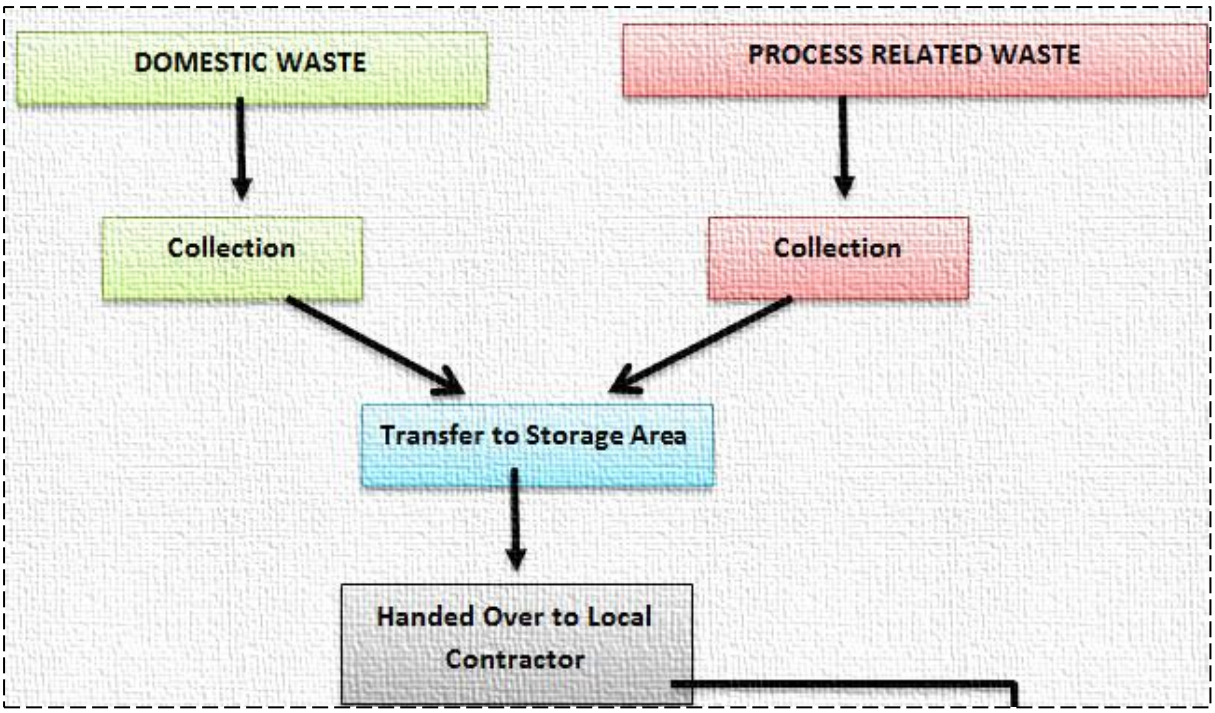


Figure: Solid Waste Management Plan

Ventilation system for maintenance of indoor air quality:

Roof overhangs, window size and placement, and overall building shape will be designed in a way to ensure good ventilation. Further the direction of prevailing winds will be considered and maximum solar gain will be ensured. The placement of porches, garages, trees will also be ensured.

Mitigation measures to control the emissions of generators:

i) Firstly, the generator made up of latest and environmentally friendly technology will be used (if needed)

ii) Standard fuel will be used in the generator (if any)

iii) Proper and regular tuning of the generator will be done (in case of installation)

iv) Double glazed glass and thick walls canopy of the generators will be installed which will limit the emissions of the noise.

All these measures will ensure the PEQS compliance of generators and emissions will not exceed the limits.

Plantation

Area for plantation will be reserved within the premises of the project and planation will be done within, outside and at the boundary wall of the unit.

Parking Area

Parking area will be made available within the unit for cars, motorcycles, trucks etc.

Occupational Health and Safety:

All the methods and procedures for machinery and chemical handling and storage will be displayed and implemented at the project site. Health and safety rules for chemical handling and storage will be maintained. Documentation for E &HS Emergency Response Plans is attached as **Annexure-H**

Personal Protective Equipment:

Following PPEs will be available for the workers in the proposed unit:

- Dust Mask
- Ear Plugs
- Ear muffs
- Safety Boots
- Safety Gloves
- Safety Belt
- Helmet
- Goggles

Types of PPEs used during construction and Operational activities

Protection	Occupational Hazards	PPEs
Head Protection	Falling objects, inadequate height clearance, and overhead power cords	Helmets with or without electrical protection
Hand protection	Hazardous material, cuts or lacerations, vibrations, extreme temperatures	Synthetic or Rubber gloves, leather, insulating material etc.
Eye and face protection	Flying particles, molten metal, liquid chemicals, gases or vapors, light radiation	Glasses, shield protective, etc.
Hearing protection	Noise, ultra sound	Hearing protectors like ear plugs, ear muffs
Respiratory protection	Dust, fogs, fumes, gases, smokes, vapors, oxygen deficiency	Facemasks or air supply
Body protection	Extreme temperatures, hazardous materials, biological agents, cutting and laceration	Aprons, insulating clothing etc. of appropriate materials

Fire Protection System

An addressable fire protection system with detection and alarm annunciation and other installations etc. would be provided to protect against any fire hazards. Fire buckets and fire

extinguishers will be installed at all sensitive places within the unit. Details of Firefighting Equipment is attached as Annexure-I

Emergency Exits:

Emergency exit points will be made available for easy evacuation in case of any emergency. Emergency response plan has been formulated for M/s RELIANCE WEAVING MILLS LIMITED and same will be followed for said construction,

Security:

The site will be secured by means of boundary walls along with the presence of security guards round the clock which will improve the security of the project site and also in its vicinity.

Personal protective equipment:

Workers will be provided with dust mask, ear plug, ear muffs, safety boots, safety gloves, safety belt, helmet and goggles etc. during the working hours to ensure personnel health & safety. Implementation of PPEs will be ensured by the proponent for the proposed project also.

Industries:

Project is located in the industrial area of district and many industries are present around the project site.

Power sources and transmission:

Estimated power requirements of the unit will be will be fulfilled by in house power generation

Available Facilities

Available facilities at the proposed project site include:

- Solid Management (SWM)
- Line and cellular telephone facilities
- Water supply, sewerage disposal and drainage systems

Restoration / Rehabilitation Plan

All possible precautions will be taken to prevent an untoward incident in terms of life and property losses. The demolition materials will possibly be reused and recycled. All excavated surfaces will be termite proofed.

On completion of the project, the debris will be removed from the site in order to maintain aesthetics of the project. All measures will be undertaken for ensuring occupational safety,

security and clean environment in the project area. Ornamental trees and flower plants will be planted on inside peripheral of the unit premises to restore the land.

Government/Relevant approvals required by the project:

The Environmental Impact Assessment (EIA) report is hereby annexed with the following essential documents to provide comprehensive insight into the operational and regulatory aspects of the project: Documents are Annexed as **Annexure-J**

Old-Age Benefit Certificate: Demonstrates the company's commitment to employee welfare and social security by providing benefits to aging employees.

Registration - Social Security Scheme: ensuring compliance with employee rights and benefits regulations.

Membership Certificate Chamber of Commerce: Confirms the company's membership in the local Chamber of Commerce, signifying its commitment to ethical business practices and community engagement.

Membership-Import Trade Control: Validates compliance with import trade regulations, ensuring responsible import practices and minimizing environmental impacts associated with international trade.

Membership Export Trade Control: Confirms compliance with export trade regulations, ensuring responsible export practices and minimizing environmental risks associated with international trade activities.

Taxpayer Certificate Registration: Validates the company's registration as a taxpayer, ensuring compliance with tax laws and regulations contributing to environmental protection and sustainable development.

Certificate for Commencement of Business: Officially approves the commencement of business operations, demonstrating compliance with legal requirements and regulations governing business activities.

Certificate of Incorporation: Confirms the company's legal status as a registered corporation, providing proof of its establishment and compliance with corporate governance standards.

NOC issued by EPA: Confirms regulatory approval from the Environmental Protection Agency (EPA) in November 2023, indicating compliance with environmental laws and regulations.

NOC issued for Disposal of Spare Water: Confirms regulatory approval for the disposal of spare water generated during operations, ensuring compliance with environmental regulations and responsible water management practices.

CHAPTER # 3

DESCRIPTION OF ENVIRONMENT

This chapter gives an overview of the environmental and social baseline information of project area, as well as District Multan data was collected by reviewing secondary data from different universities research articles and publications, Governmental department studies, Non-Governmental organization reports and primary data was collect from the field visit and survey at different timed intervals and with the consultation of stockholders.

Major environmental components are:

- Physical Environment
- Biological Environment
- Socioeconomic Environment

Proposed site location:

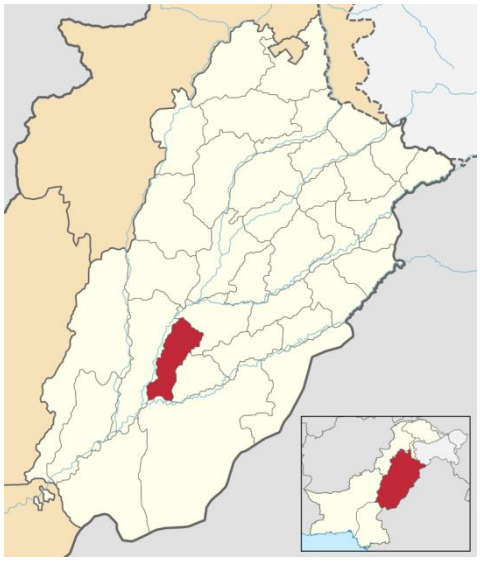
The project site is located at Khewat No: 35/ 34, 39/ 38, 45/ 43, 111/ 110, Khatooni No, 50, 55, 62, 236-239, Situated at Mouza Karpalpur, Khanewal road, Multan. Project co-ordinates are as follow:

Land Coordinates:

Proposed Site	**30°15'0.14"N**	**71°36'49.31"E**

The subject area lies within the administrative boundaries of District Multan. The subject area is easily accessible by a road called WAPDA road which links with main road called NH-5.

Brief Description of the District:

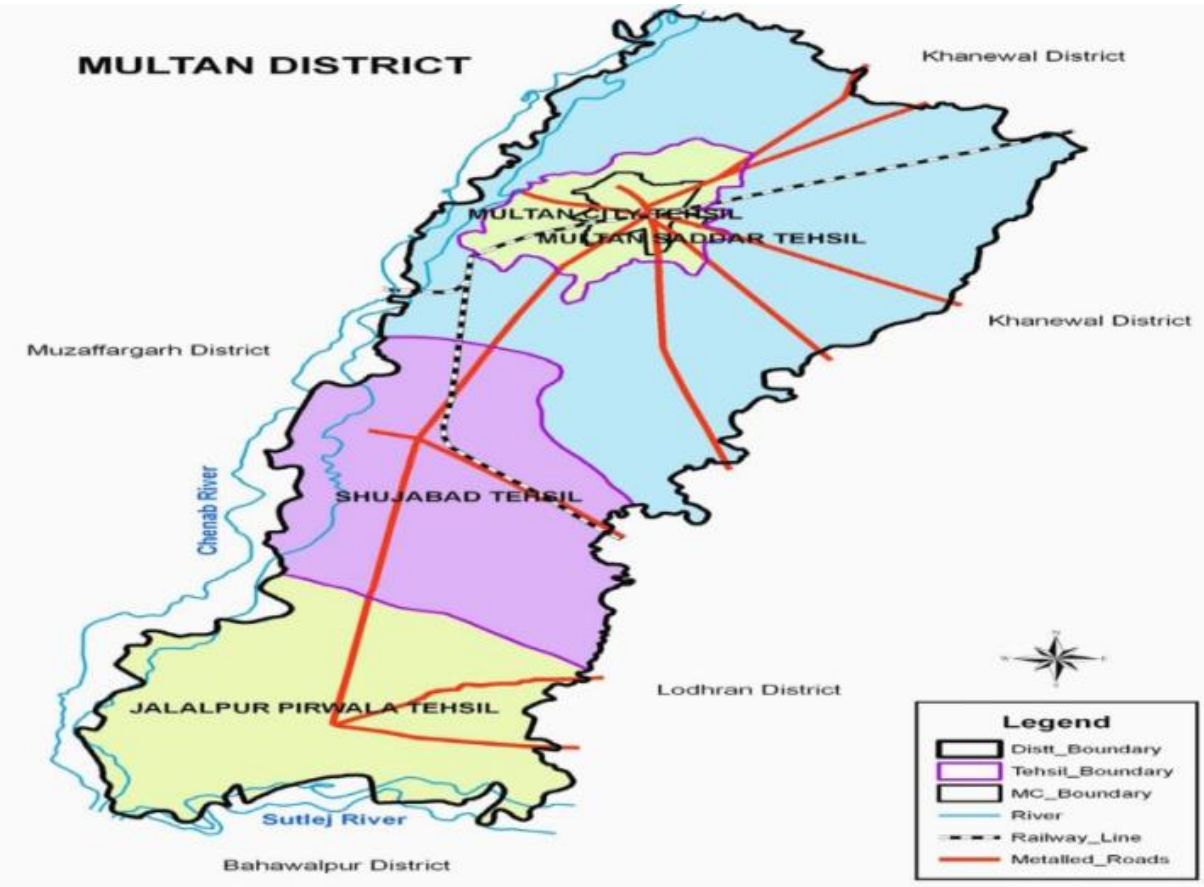


The origin of the name Multan is obscure. Hiuen Tasng who visited this place in 641 A.D., calls this place Mu-lo-san Pu-lu. Alberuni quoting a Kashmiri author calls this place Multana. According to another source the early name of the town was Multarang or Multaran. This place has been called by different names at different times. In the time of Narsing Bhagwan its name was Kashep Puri. Later on it was known as Parlhad Puri and then as Bhag Pura and Samb Pura. In

the time of Bhagwan Krishan the town acquired the name of 'Mitroon' and later on called as Multan (USAID, Baseline Household Survey, Multan District, 2010).

Multan District, is a district of the Division Multan in the Punjab province of Pakistan. Its capital is the city of Multan. The district of Multan is spread over an area of 3,721 square kilometres.and comprises of the following tehsils:

- Jalalpur Pirwala
- Multan City
- Multan Saddar
- Shujabad



Demography:

According to 2017 census the population of the district has 760,858 households and its population reached to 4,745,109 of which 2,437,412 are males and 2,307,504 are females. This census shows that 2,686,819 persons live in rural while 2,058,290 live in urban areas. It is further reported that there are 193 transgenders.

Administrative Units	Households	Population 2017				Population 1998	Sex Ratio	1998-2017 Avg. annual Growth Rate
		Male	Female	Transgender	All sexes			
Multan District	760,858	2,437,412	2,307,504	193	4,745,109	3,116,851	105.63	2.23
Rural	429,984	1,376,006	1,310,725	88	2,686,819	1,688,376	104.98	2.47
Urban	330,874	1,061,406	996,779	105	2,058,290	1,428,475	106.48	1.94

(Ref: Provisional Province Wise Population by Sex and Rural/Urban; Census - 2017 Pakistan)

Language:

According to the 1998 census, Saraiki is the most widely used first language spoken by 61% of the population. It is followed by Punjabi with 22% and Urdu with 16%.

Climatic Conditions:

The Köppen Climate Classification subtype for the climate of Multan district is "**Bwh**". (Tropical and Subtropical Desert Climate).

This climate is dominated in all months by the subtropical anticyclon, or subtropical high, with its descending air, elevated inversions, and clear skies. Such an atmospheric environment inhibits precipitation. Most of Earth's tropical, true desert climates occur between 15° and 30° latitude. The most extreme arid areas also are far removed from sources of moisture-bearing winds in the interiors of continents and are best developed on the western sides of continents, where the subtropical anticyclone shows its most intense development. An exception to the general tendency for aridity to be associated with subsidence is in the Horn of Africa region, where the dryness of Somalia is caused more by the orientation of the landmass in relation to the atmospheric circulation. Both the high- and low-sun monsoonal winds blow parallel to the coast, so that moisture-laden maritime air can penetrate over land only infrequently.

The average temperature for the year in Multan is 78.0°F (25.6°C). The warmest month, on average, is June with an average temperature of 96.0°F (35.6°C). The coolest month on average is January, with an average temperature of 56.0°F (13.3°C).

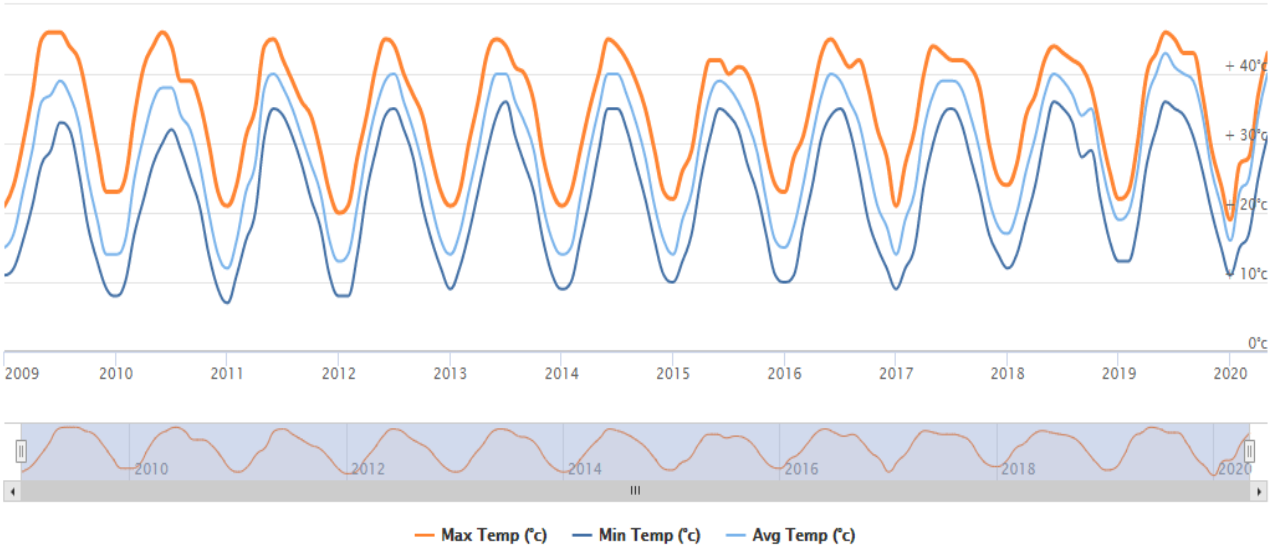
The highest recorded temperature in Multan is 120.0°F (48.9°C), which was recorded in May. The lowest recorded temperature in Multan is 28.0°F (-2.2°C), which was recorded in January.

The average amount of precipitation for the year in Multan is 7.0" (177.8 mm). The month with the most precipitation on average is July with 2.2" (55.9 mm) of precipitation. The month with the least precipitation on average is October with an average of 0.0" (0 mm).

Ref: https://www.weatherbase.com/weather/Multan

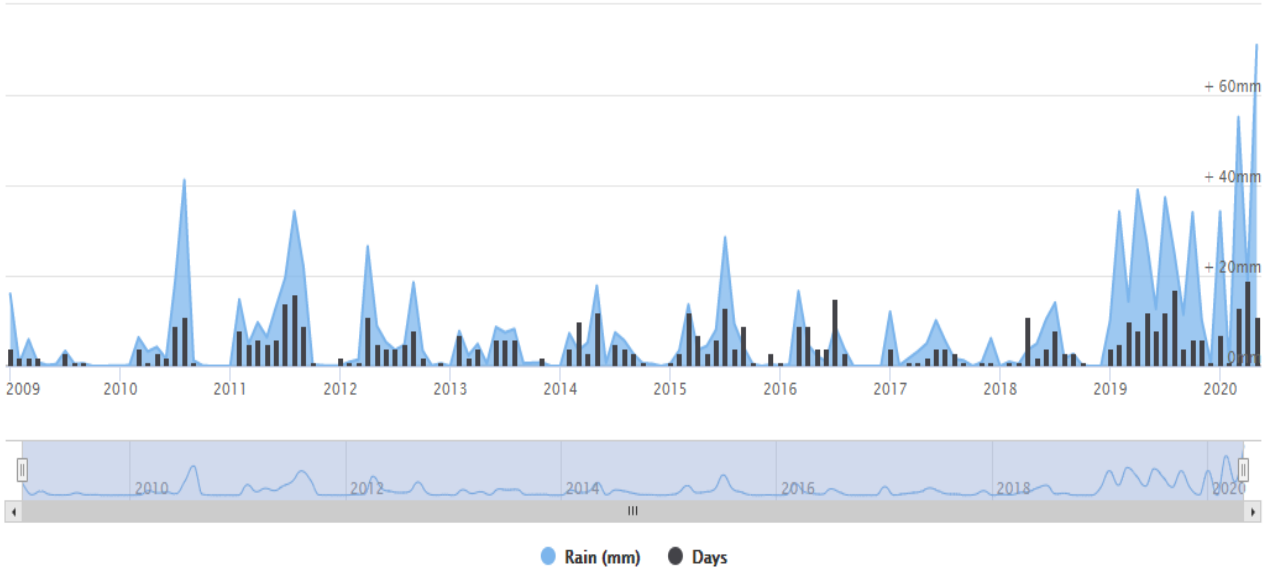
Graphical representation:

Temperature:



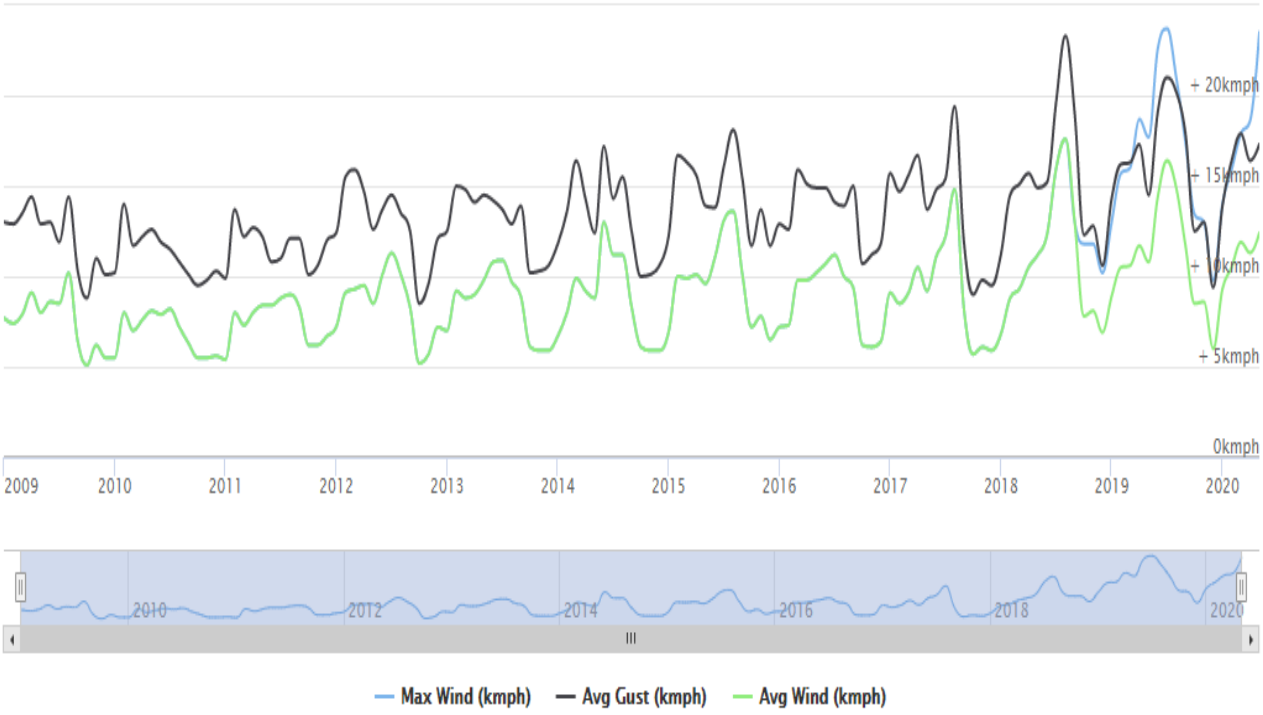
Ref: www.worldweatheronline.com/*Multan/Pakistan*

Rainfall Days & Rain (mm):



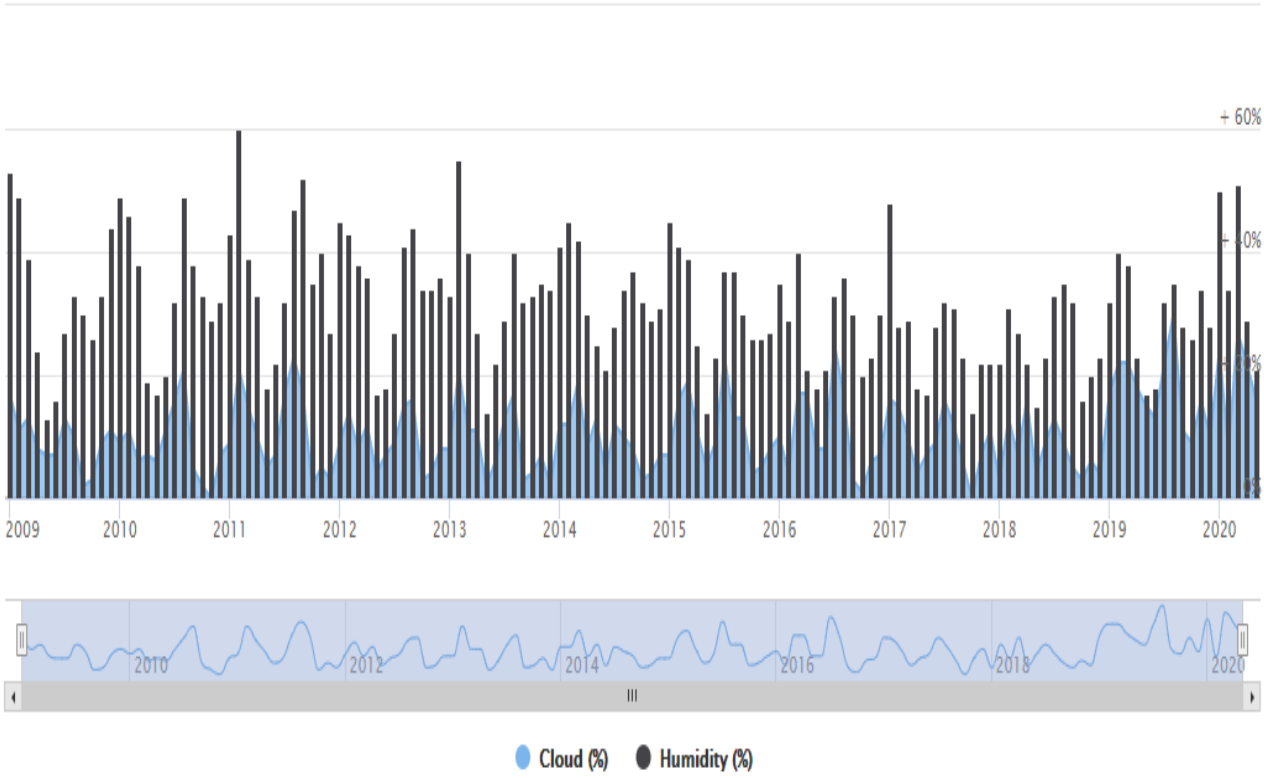
Ref: www.worldweatheronline.com/*Multan/Pakistan*

Wind Speed:



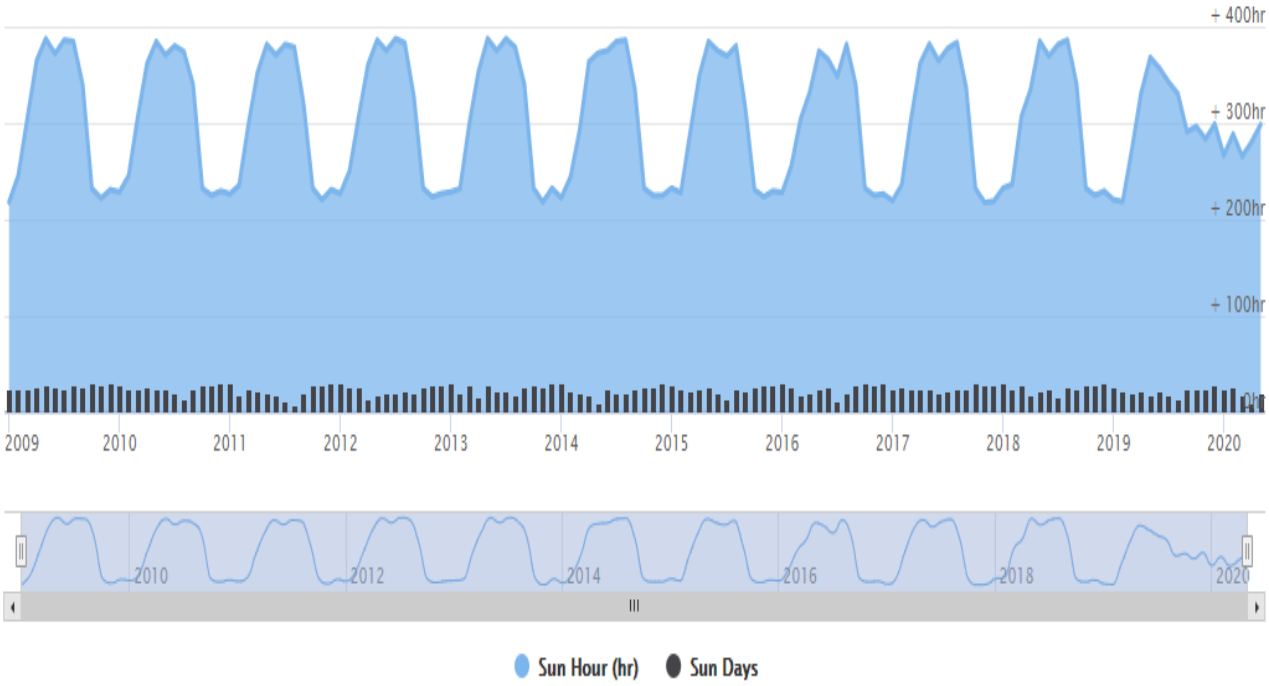
Ref: www.worldweatheronline.com/*Multan/Pakistan*

Humidity:



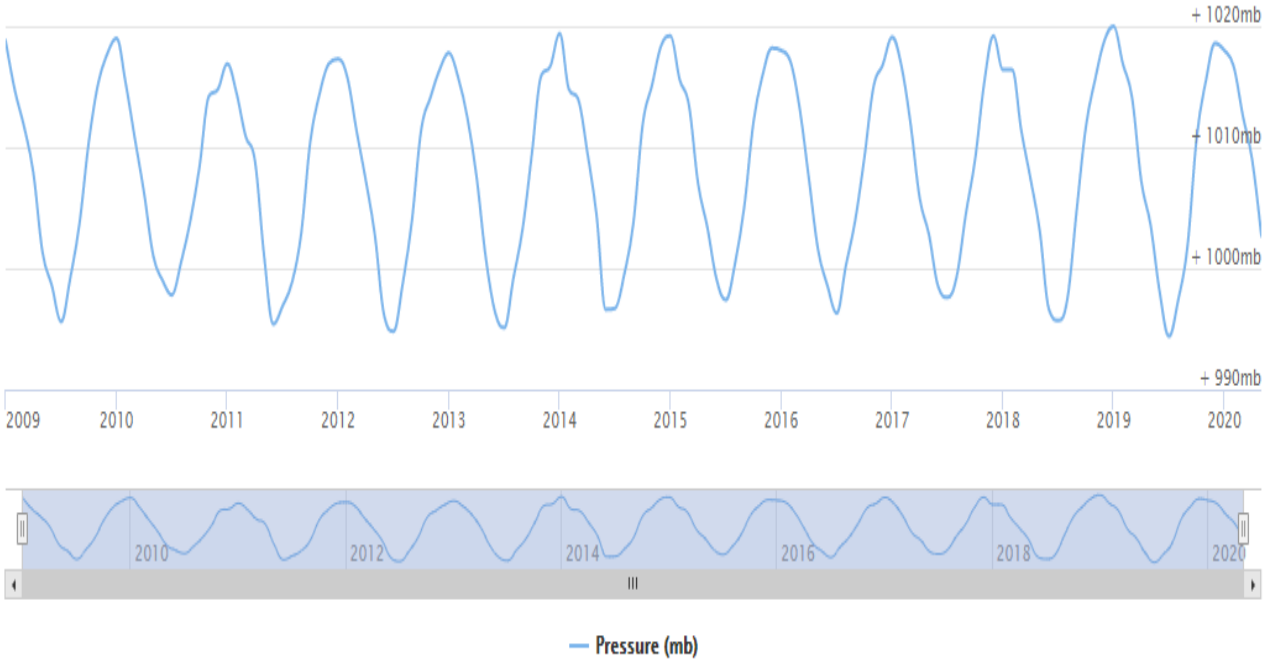
Ref: www.worldweatheronline.com/*Multan/Pakistan*

Sun Hours & Days:



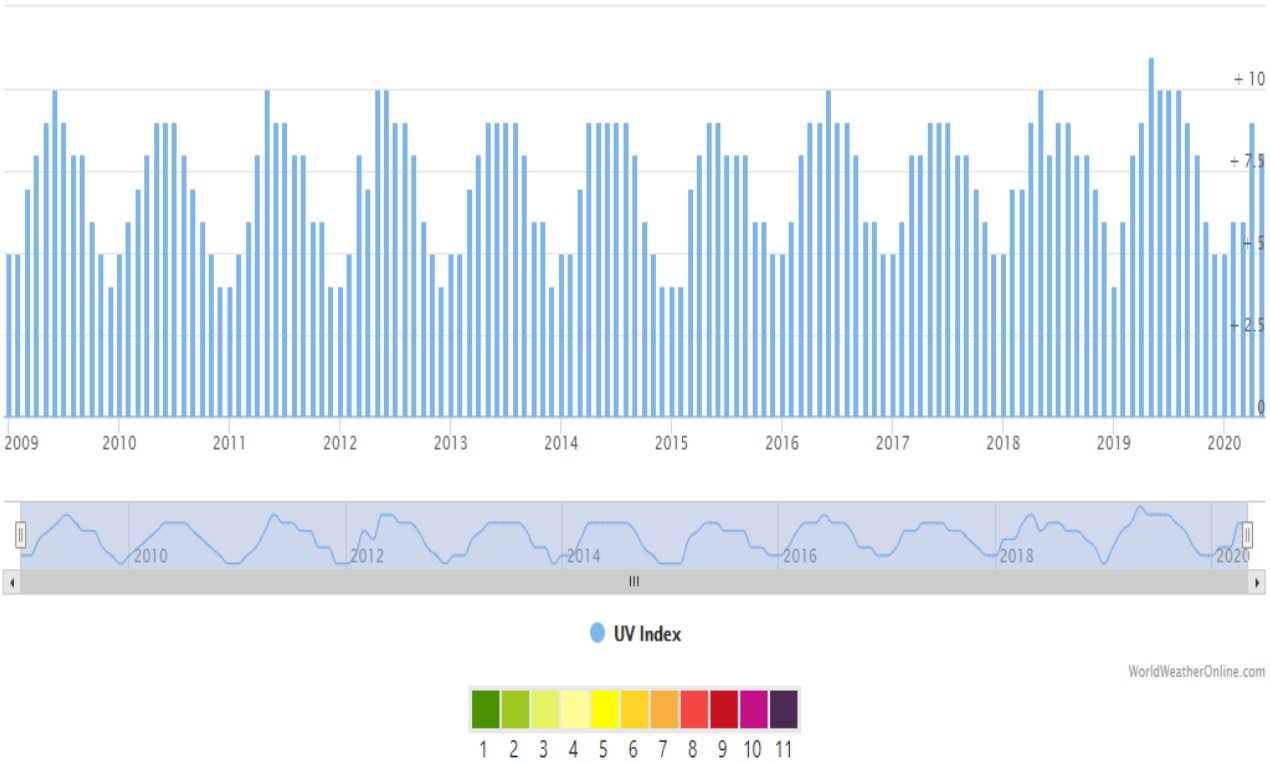
Ref: www.worldweatheronline.com/*Multan/Pakistan*

Pressure:



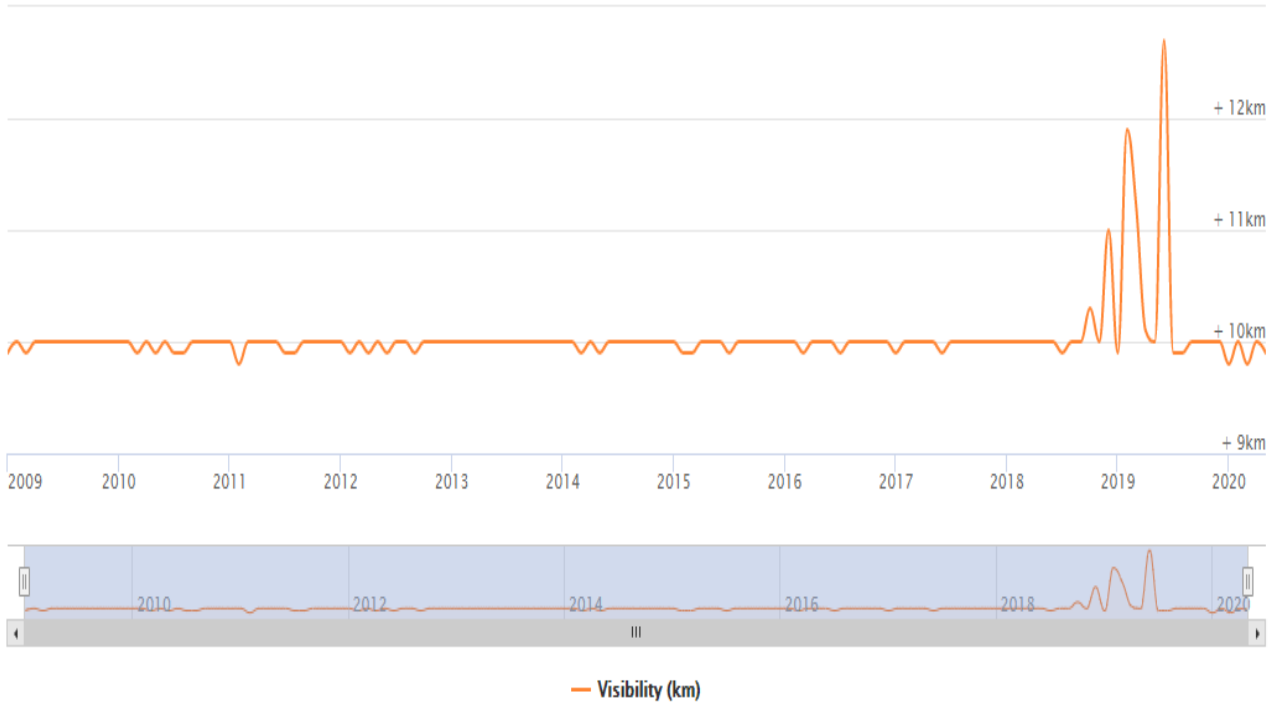
Ref: www.worldweatheronline.com/*Multan/Pakistan*

UV Index:



Ref: www.worldweatheronline.com/*Multan/Pakistan*

Visibility (km):



Ref: www.worldweatheronline.com/*Multan/Pakistan*

Air Quality:

Atmospheric pollution has a strong impact on daily life. Project site is located at 17-km Khanewal road, District Multan where many polluting activities are already in process. Industries and vehicles are a major source of air pollution in the project area. Monitoring was conducted at the project site by using Fine Dust Sampler IPM-FDS 2.5/10µ and Ambient Air Analyzer.

To record the baseline ambient air quality of the project area, monitoring was conducted at advised locations to assess the concentration of priority pollutants (Carbon monoxide, Nitrogen dioxide, Sulphur dioxide and PM_{10}) in the air. Lab reports of Ambient Air Monitoring are attached as **Annexure-H** with the EIA report.

Noise Level Monitoring:

Basic Environmental conditions:

During the measurement following conditions were prevailed on workplace:

Metrological Conditions:

During the noise level monitoring weather was dry and sky was clear. Air was blowing at normal speed.

Monitoring Instrument:

The description of the instrument used for the noise level monitoring is given below:

Name: Digital sound level meter
Model: AR824
Company: Intel Instruments plus
Frequency Range: 31.5 Hz to 8 kHz

Methodology adopted:

Noise level was monitored at four points; lab results are attached as **Annexure-H.**

Ground water:

The underground water will be used as a source of water at the project site. Sample was taken from the tube well near the project area to test its parameters. Lab results are attached as **Annexure-H.**

Geology:

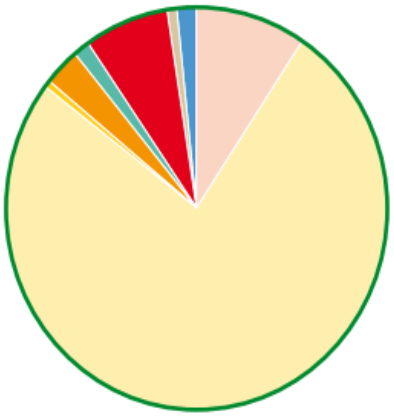
Area of Multan District is comprised of fluvial deposits of River Chenab. The deposits are composed of flood plain muds, mixed with sands, levee deposits and fine to medium sands point bars. Remnants of colian deposits are rare. Such deposits have been reworked by floods and heavy summer rains.

Ref: *Geotechnical Zonation and their relation to geology of Pakistan by Khizar Hayat*

Land use:

Multan is known to be one of the oldest cities in Southeast Asia. The land of Multan district is plain and very fertile with Chenab river passing on its western side, across which lies Muzaffargarh. The portions of tehsils of Multan and Shujabad close to the river Chenab are usually flooded during monsoons season. District headquarter is located at Multan and it comprises of four tehsils: Multan City, Multan Saddar, Shujaabad and Jalalpur Pirwala. A large number of Sufis shrines are present in the district.

LAND COVER IN PERCENTAGE



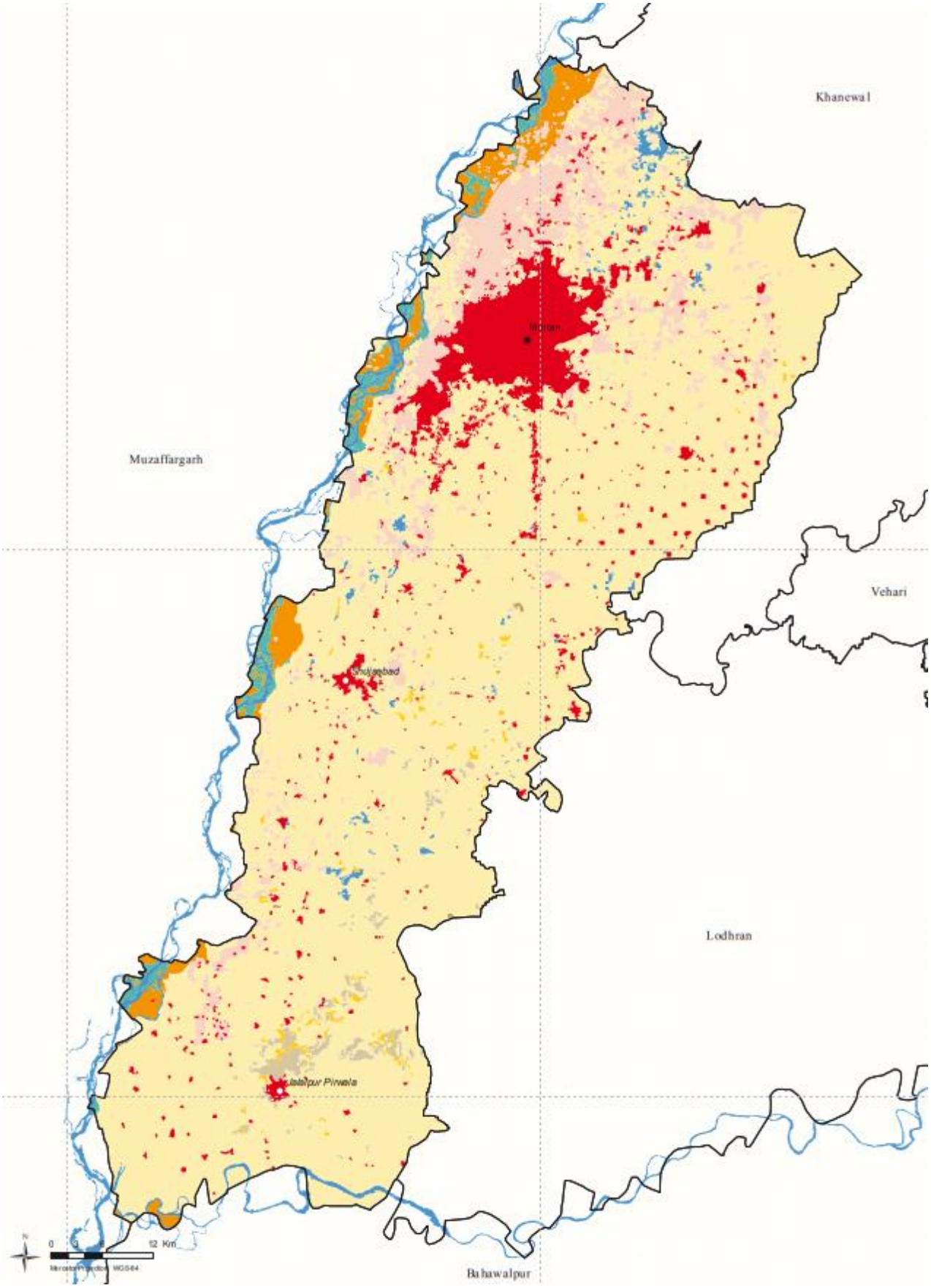
DISTRIBUTION OF LAND COVER IN THE DISTRICT

Legend	km²	%
Orchards	347.56	9.5
Crop Irrigated	2,787.35	75.9
Crop Marginal and Irrigated Saline	20.31	0.6
Crop in Flood Plain	108.06	2.9
Crop Rainfed	0.00	0.0
Forest - Natural Trees and Mangroves	0.04	0.0
Natural Vegetation in Wet Areas	51.20	1.4
Range Lands - Natural Shrubs and Herbs	1.33	0.0
Built-up	263.39	7.2
Bare Areas	0.26	0.0
Bare Areas with Sparse Natural Vegetation	36.29	1.0
Wet Areas	56.49	1.5
Snow and Glaciers	0.00	0.0
Grand Total	**3,672.28**	

Ref: *Land Cover Atlas of Pakistan, the Punjab province (FAO, Govt. of Punjab)*

Water Resources:

District Multan is located around two famous rivers i.e., River Chenab on west and River Satluj on south of the Multan District



Ref: Land Cover Atlas of Pakistan, The Punjab Province (FAO, Govt. of Punjab)

Agriculture:

Main Crops:

- Wheat
- Cotton
- Sugarcane
- Mango
- Citrus
- Guava
- Pomegranate
- Potato
- Onion
- Cauliflower

Province & District	Punjab	Multan
Agricultural Population (Millions)	51.1	1.2
Total Population (Millions)	96.7	3.0
Total District Area (Km_2)	205,403	3.648

Ref: Environmental and Social Management Framework; FAO of the United Nations

Ref: https://punjab.gov.pk/multan_natural_resources

Socio-economic Environment:

Demography:

According to 2017 census the population of the district has 760,858 households and its population reached to 4,745,109 of which 2,437,412 are males and 2,307,504 are females. This census shows that 2,686,819 persons live in rural while 2,058,290 live in urban areas. It is further reported that there are 193 transgenders.

Education:

SCHOOLS						
Schools	**H. Sec**	**High**	**Middle**	**Primary**	**sMosque**	**Total**
Male	18	109	102	356	19	604
Female	11	65	112	647	00	835

STUDENTS

Students	H. Sec	High	Middle	Primary	sMosque	Total
Male	20172	68525	38689	82312	1276	210,974
Female	18257	56864	35865	76445	984	188,415

TEACHERS						
Teachers	H. Sec	High	Middle	Primary	sMosque	Total
Male	676	2309	1064	1550	59	5,658
Female	608	1886	1378	2409	05	6,286

Ref: https://schoolportal.punjab.gov.pk/sed_census/new_emis_details.aspx?distId=361--Multan

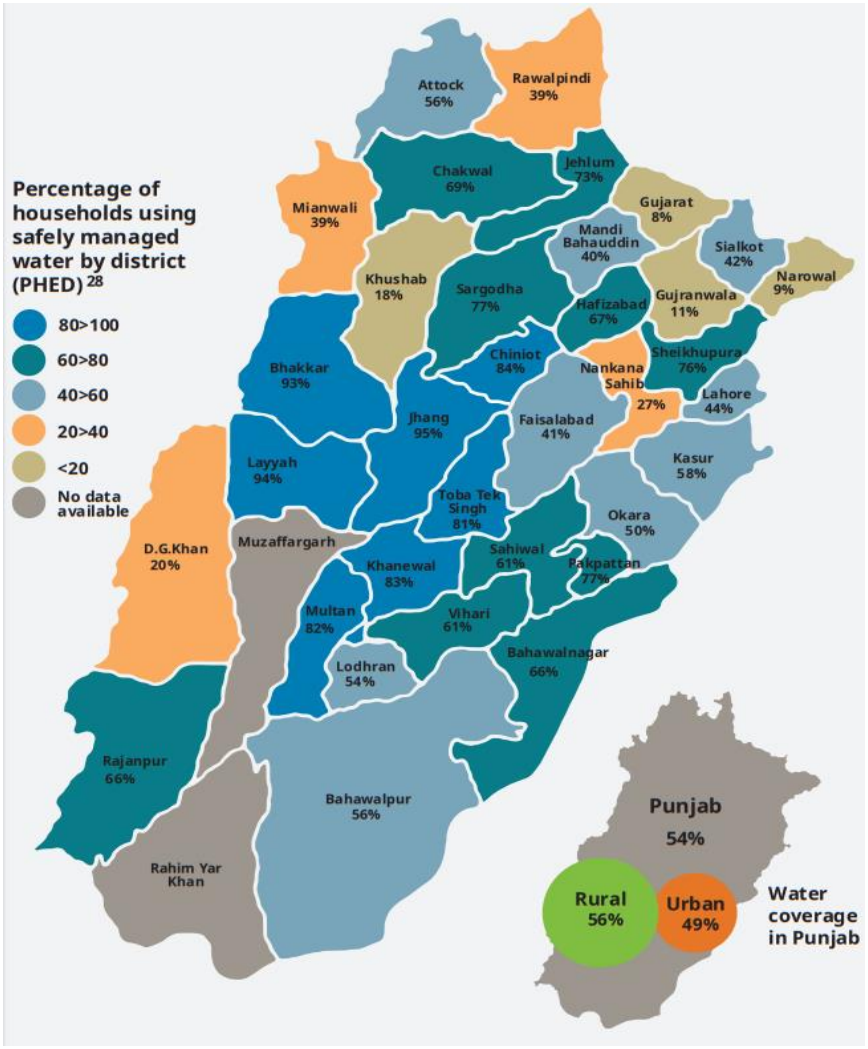
Health Services:

District Multan	Hospitals		Dispensaries		R.H.Cs Total		B.H.Cs Total		T.B. Clinics		S.H. Centres		M.C.H. Centres	
	No.	Beds	No.	Beds	No.	Beds	No.	Beds	No.	Beds	No.	Beds	No.	Beds
Multan Cant. Tehsil	11	1439	23	-	02	06	04	04	-	-	10	60	15	-
Multan Saddar Tehsil	01	100	14	-	05	100	50	100	-	-	-	-	05	-
Jalalpur Pirwala Tehsil	01	60	08	-	01	20	16	32	-	-	-	-	01	-
Shujabad	01	60	06	-	02	40	15	28	-	-	-	-	01	-

Ref: *Punjab Development Statistics, 2017*

Safe Drinking Water:

Multan town is among those most stricken by water pollution, and access to safe water is paramount important.



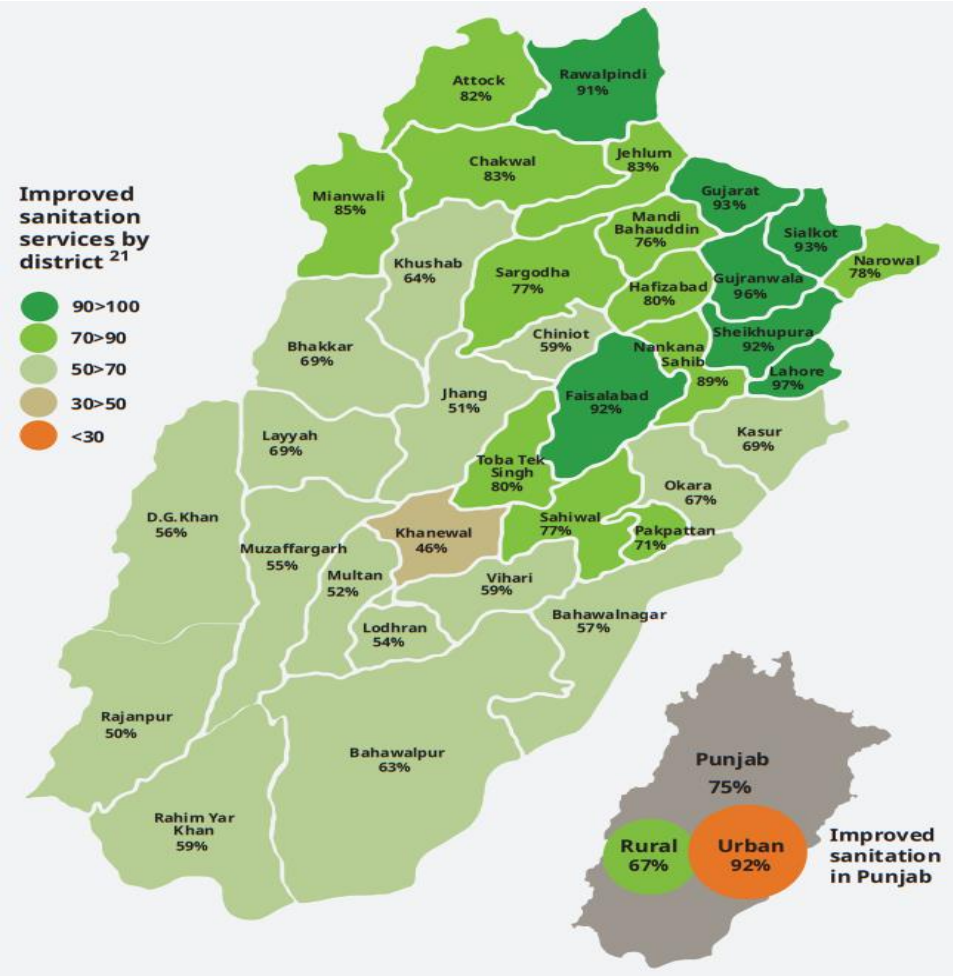
Ref:https://www.wateraid.org/pk/sites/g/files/jkxoof326/files/WASH%20factsheet%20Punjab.pdf

Improved Sanitation Facilities:

As per Punjab MICS 2017-18, 63.2% of the population is living in households who use improved sanitation facilities, which is higher in urban as compared to rural areas.

USE OF IMPROVED AND UNIMPROVED SANITATION FACILITY (%)	
Piped sewer system	42.3
Septic tank	8.8
Pit latrine	11.2
DK where	0.7
Ventilated improved pit latrine	0.1
Pit latrine with slab	0.3
Pit latrine without slab/ Open pit	0.1
Bucket	0.1
Open drain	24.8
Other	0.4
DK/ Missing	0.0
Open defecation (no facility, bush, field)	11.4
Total	**100.0**

Percentage using improved sanitation	**63.2**
Number of household msembers	**14,504**



Ref: https://www.wateraid.org/pk/sites/g/files/jkxoof326/files/WASH%20factsheet%20Punjab.pdf

Financial Status:

INDICATOR	District (%)	Punjab (%)
Unemployment rate (15+ Years)	9.1	6.8
Family member working outside village/ town	06	12
Percent of households who own three or more possessions	86	89
Percent of household members who use at least one utility	96	94
Household characteristics:		
- Finished floor (pacca)	56	57
- Finished roof (pacca)	75	84
- Finished wall (pacca)	68	76
Ownership of assets:		
- House	90	84
- Land	25	34
- Livestock	37	51

Ref: *MICS, Govt. of Punjab 2007-08*

Poverty:

DISTRICT MULTAN INCIDENCE OF POVERTY FROM 2004-05 TO 2014-15 (%)		
2004-05	**2008-09**	**2014-15**
55.9	52.1	35.7

DISTRICT MULTAN MULTIDIMENSIONAL POVERTY INDEX (MPI) 2014-15		
MPI	**Incidence (H)**	**Intensity (A)**
0.173	35.7%	48.5%

Ref: *Punjab Economic Report, Poverty Profiling in Punjab*

Cultural Heritage:

Multan is one of the oldest cities of South Asia and known as the city of Saints' tombs. The cultural assets of Multan encompasses a vast diversity ranging from the rich intangible culture including poetic and literary traditions, alluring music associated with Sufi shrines, rich folk traditions of dance, music, rites and customs, value system, variety of handicraft skills, to the amazing tangible cultural heritage ranging from ancient archaeological sites, public institutional buildings and historical tombs of Muslim saints.

Tomb of Shah Rukn e Alam (Bahauddin Zakaria), Multan.	

Dam Dama Multan Fort	
Bab-e-Qasim Multan	

Sawi Mosque Multan	

CHAPTER # 4

SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & THEIR MITIGATION MEASURES

The following chapter describes the overall possible impacts of project on the physical, biological and socioeconomic environment because of construction and operation phases and mitigation measures to minimize the significance of the possible impacts up to an acceptable level. The anticipated impacts related to project location, design, constructional and operational phases have been assessed and mitigation measures are provided accordingly.

Environmental Impacts due to project location

Project is present in the industrial area of the District Lahore. No nearby human settlement exists within the radius of 500 meter. Unit is proposed construction of Knitting and dyeing unit, and effluent treatment plant; site does not fall in the category of sensitive area and no environmentally sensitive localities exist within radius of study area. The only issue which can arise due to the location of the subject project could be the issue of traffic congestion due to transportation of the construction material at the project site. If the project proponent maintain HSE conditions and comply with the PEQS limits than, there will not be any significant impacts of the project on the environment.

If the mitigation measures are effectively implemented, the residual impact of the Subject project activities on the area's geophysical environment is expected to be insignificant.

Impact significance: Low or may be positive

Nature of impact: Direct

Duration: Long-term

Timing: Operation phase

Reversibility: NA

Likelihood: Low (unlikely),

Consequences: Mild or may be positive

Mitigation Measures for location phase impacts

- Project site should have good road infrastructure and efficient road infrastructure already exists there that is used currently to access the site and there is no issue of the road congestion due to the wide, good and paved road.
- Location can be considered as the positive impact due to utilization of the product in the same District.

Environmental Impacts due to the project design

Subject project is the proposed construction Knitting and dyeing unit, and effluent treatment plant under the name of M/s RELIANCE WEAVING MILLS LIMITED. Area for parking, solid waste management and waste water treatment facility is already present within the existing facility.

Firefighting plan, health & safety plan, tree plantation plan, emergency response plan has been formulated incorporated during the designing phase of the project. The subject project will consist of;

- Dyeing, hall, canteen, prayer hall, kitchen and dyeing lab
- Finishing hall (Production hall, inspection machines area, Offices area, Finishing quality lab, P.D hall, stitching hall and dispatch area)
- Boiler
- Underground tank
- Work shop
- Store
- Cafeteria etc.

Following are the major Environmental impacts due to the development related to the design:

- Structural stability of the proposed project.
- Soil structure and soil bearing capacity
- Road infrastructure design

- Emergency exit in the proposed project
- Firefighting system
- Wastewater disposal system design
- Rain water harvesting capacity of the drainage system
- Electricity hazards

Impact significance: moderate to high or may be negative

Nature of impact: direct

Duration: Long-term

Timing: Constructional phase & Operation phase

Reversibility: NA

Likelihood: moderate to high

Consequences: moderate to high or may be negative

Mitigation measures and recommendations

Following are the mitigation measures and recommendations to minimize the anticipated impacts:

- Emergency exist points should be marked within the project building.
- Firefighting system should be designed for the emergency situations.
- Geo-technical investigation of the project site should be conducted.
- Electricity system should be designed safe and sound.
- Electricity wires should be covered by thick plastic/electricity resistant covers.

Environmental Impacts during the construction phase

Impacts related to the construction phase of the subject project are discussed below:

Impacts on the Physical Environment

Soil Erosion and Pollution

There is a possibility of soil erosion and pollution to occur during construction phase of the project. The clearing of vegetation could lead into soil erosion when the cleared land is exposed to natural agents such as wind and surface run-off. Removal of top soil after site clearance by agents such as wind, rain water, and surface run off is a likely action to occur. Similarly, accidental oil spills from construction equipment and discharge of wastewater from equipment washing to the environment might accelerate soil pollution to some extent. Oil spills may infiltrate into soil causing soil pollution and later water pollution during rainy season.

However, this impact is localized around machinery, maintenance areas or garage and areas of concentrated activities. Severity of impact is localized with low intensity due to the nature of project, which shall require minimum number of people during construction and shall not require heavy construction equipment. It is expected that the impacts will be low, local, and they will occur mostly during the construction stage (short term).

Land Degradation

Most of the building materials such as stones, aggregates, and sand required for construction of the proposed project will be obtained from nearby quarry sites. Since substantial quantities of these materials will be required for construction of the development, the availability and sustainability of land resources at the extraction sites will be negatively affected as they are not renewable in the short term.

In addition, the sites from which the materials will be extracted may be significantly affected in several ways including landscape changes, vegetation, poor visual quality and opening of depressions on the surface leading to several human and animal health and safety risks. Similarly, during construction of the proposed project a lot of solid waste will be generated. These include papers used for packing cement, plastics, timber remains, landscape and land clearing debris, asphalt pavement, gravel and aggregate products, concrete, masonry scrap and rubble (brick, concrete masonry, stone) among others. These will have an implication on dump environment. It is expected that the contractor will obtain materials for construction purposes from licensed suppliers or from authorized areas.

Likewise, disposal of construction waste will be on designated sites. The extent of this impact is localized with a low intensity. It is likely that the impact may occur. The impact can be highly improved/eliminated with mitigation. Therefore, the impact is negative and of low significance.

Air Pollution

Air pollution is quite likely to occur during construction phase. This is due traffic and other equipment using fossil fuels that release hydrocarbons and other gases including carbon dioxide, nitrous oxides, sulphur oxides, and particulate matters which may pollute the air. Likewise, activities like land clearing, vehicle movement, excavations for buildings foundations, construction drive ways and landscaping may generate dust especially during the dry season.

Other sources of air pollution will occur due to decomposition and/or burning of the cleared vegetation and dust from gravel drive ways. The level of air pollution originating from the

above mentioned sources are expected to be low, localized and short term. No serious impacts are expected on people and the environment as whole.

Surface Water Pollution

Surface water quality may be polluted due to increased erosion, run off from construction site, and contamination in the event of oil spills from equipment and machinery. The extent of this impact will depend directly on the magnitude of other causal factors such as level of clearance.

Impacts on Biological Environment

Impacts on Flora

The clearance of most vegetation during construction to leave space for construction of proposed unit and other building facilities and access roads will bring negative impacts to flora population. Moreover, direct exposure to nitrous oxides (NOx) may cause growth inhibitions in plants to some extent. No special plant species of international conservation importance was recorded at proposed site. The impacts are therefore considered of low significance.

Impacts on Fauna

The nature of the site has not attracted several organisms to find refuge in the area although some including different types of birds, reptiles, amphibians and invertebrates are found. The clearance of vegetation and presence of noisy machinery, trucks and workforce will create unfavorable environment for most of these organisms while crawling organisms will eventually vanish following construction of paved surface.

However, the temporary nature of the construction activities will result in impacts of short-term duration and therefore the impact is considered of low significance.

Impacts on Socioeconomic Environment

Workers Accidents and Hazards during Construction

Construction workers are prone to accidents resulting from construction activities. These accidents may have acute or chronic impacts depending on nature, severity and intensity. In this regard, construction and mobilization activities of the proposed unit could result into accidental injuries and hazards, etc. which could negatively impact the workforce.

Because of the intensive engineering and construction activities including erection and fastening of roofing materials, metal grinding and cutting, concrete work, steel erection and welding among others, construction workers will be exposed to risks of accidents and injuries. At times, such injuries may be from accidental falls from high elevations, injuries from hand tools and construction equipment cuts from sharp edges of metal sheets and collapse of building sections among others.

Vibration and Noise

The level of noise and vibration are likely to increase during the construction phase. The noise will be mainly come from vehicles and equipment operation during construction activities as well as people working on the project construction. This is a short-term impact and it will be felt mostly around construction sites and its peripherals.

There will be no drilling activities or involvement of heavy or high noise machinery. For residential areas located within 20km from the Project site boundary, it is predicted that the construction phase and operation of the proposed project will not pose any significant and the annoyance level is within the "no to little" impact category.

Considering technological advancement in construction industry, it is anticipated that machinery and equipment to be used during construction will be modern, versatile, and quieter than the old ones. It is also likely that they will require fewer numbers of operators reducing noise from workers. Therefore, the levels of noise and vibrations are anticipated to be within the tolerable limits, short term and localized. In view of the above and the fact that construction will concentrate on non-residential area, no significant impact is anticipated and the impact can be highly mitigated.

Employment Opportunities

On the other hand, the proposed project will have, during construction phase, potential positive impact to the local community through provision of employment. It is expected that maximum people will be employed during construction phase. Employment will be in form of managers, skilled labors as well as unskilled laborers. Therefore, apart from employment benefits accruing to local people other national and international experts are likely to be employed by the project especially at senior positions.

Income Generation among Suppliers

During construction phase, the proposed project plan to source most construction materials from local and/or national sources including cement, iron sheets, steel bars, pipes, etc. from local shops. This demand therefore, will create market for local people and/or elsewhere in the country engaged in supplying construction materials leading to significant positive economic benefits to suppliers on short term basis.

Impacts on Security

The presence of laborers and expensive construction equipment, machinery and materials in the sites could potentially pose a security risk at the project site. Furthermore, offenders may capitalize on increased movement during construction and anonymity created by the

construction activities to carry out criminal activities in the site and surrounding areas. This impact is likely probable due to low security measures from the fact the site is slightly far from police station(s) that could otherwise prevent criminal activities around the project site.

Accordingly, the impacts on the area's security are considered to be of medium significance. Therefore, appropriate security measures should be provided at the site through fencing, security checks/screening of workers and their guests and 24 hours security watch by expert security men (normally privately contracted) to prevent such criminal activities from happening at the site.

Mitigation Measures

Protection of Flora

In order to protect plant species from potential negative impacts, the proponent shall ensure that:

- The contractor is responsible for informing all employees about the need to prevent any harmful effects on natural vegetation on or around the construction site as a result of their activities;
- Clearing of natural vegetation is kept to a minimum;
- Unnecessary removal, damage and disturbance of natural vegetation are prohibited;
- Re-vegetation of the proposed project site is undertaken;
- Indigenous trees are planted around project area to enhance natural habitat

Land Degradation and Soil Erosion Control

Potential negative impacts on land and soils shall be mitigated by ensuring that:

- The contractor implements erosion control measures as an on-going exercise;
- During construction, the contractor protects all areas susceptible to erosion by installing necessary temporary and permanent drainage works as soon as possible and by taking any other measures necessary to prevent storm water from concentrating in streams and scouring slopes, banks, etc.;
- Any tunnels or erosion channels developed during the construction or maintenance period shall is backfilled and compacted and the areas restored to a proper condition;
- Areas where construction activities have been completed and where no further disturbance would take place are rehabilitated through re-vegetation.

- Ground clearance is minimized and if possible concentrated only to the specific building foundation areas, and only when it is necessary.
- Prompt reclamation of exposed soils is done
- Construction during long rains period should is done with caution to avoid soil from being washed away
- Topsoil excavated from buildings foundations is stored for re use on other areas like rehabilitations of quarries

Soil and Water Pollution Measures

Measures to mitigate soil and water pollution impacts during construction phase shall ensure that:

- Concrete mixing directly on the ground is prohibited and only be undertaken on impermeable surfaces;
- Concrete batching activities are located in an area of low environmental sensitivity;
- All runoff from batching areas is strictly controlled; cement-contaminated water is collected, stored and disposed of at an approved site.
- Contaminated water storage facilities are not left to overflow and appropriate protection from rain and flooding are implemented;
- Unused cement bags are stored out of the rain where runoff won't affect it;
- Used (empty) cement bags are; collected, stored in weatherproof containers to prevent windblown cement dust and water contamination, not to be used for any other purpose and shall be disposed of on a regular basis via the solid waste management system;
- All excess concrete is removed from site upon completion of concrete works and disposed of whilst preventing washing of the excess concrete into the ground;
- Entrance or accidental spillage, of solid matters, contaminants, debris and other pollutants and wastes into surface and ground water is prevented;
- Awareness of employees to prevent unnecessary oil spills and protection of environment in their daily duties is promoted; and
- All excess aggregate is removed from site and properly disposed.

Waste Management

To ensure that solid waste is properly managed and potential negative impacts are mitigated, the contractor shall ensure that:

- All facilities are maintained in a neat and tidy condition. Measures to reduce the negligent behavior with regard to the disposal of all refuse are taken, bins, containers and refuse collection facilities for later disposal are provided at all places of work;
- Solid waste may be temporarily stored on site in a designated area prior to collection and disposal;
- Waste storage containers are covered, tip-proof, weatherproof and scavenger proof;
- No burning, on-site burying or dumping of waste shall occur;
- Inert construction rubble and waste materials are disposed of by burying in the borrow pits or a designated site;
- All excavated materials, debris from construction works are not to be stockpiled or deposited near or on stream banks or other watercourse perimeter where they can be washed away by high water or storm runoff or can any way enters to water sources itself;
- Metal refuse bins or equivalent plastic refuse bins, all with lids, are provided to all buildings;
- Domestic refuse is collected and removed from all facilities at least twice per week and transported to the approved refuse disposal site in covered containers or trucks;
- Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery are collected in holding tanks and sent back to the supplier;
- Runoff from fuel depots / workshops / machinery washing areas and concrete batching areas is collected into a conservancy tank and disposed of designated site

Surface Water Quality

In ensuring that the quality of surface water on site is maintained, several measures will be taken as follows:

- All excavated materials and debris from construction works shall not be stockpiled or deposited near or on dam banks or other watercourse perimeter where they can be washed away by high water or storm runoff or can any way enter the dam itself;
- The nearby pond and spring shall be protected from erosion and direct or indirect spills of pollutants, e.g. sediment, refuse, sewage, cement, oils, fuels, chemicals, wastewater, etc.;
- In the event of a spill, the contractor shall take prompt action to clear polluted areas and prevent spreading of the pollutants.

Air Quality Control

The contractor shall ensure air quality by undertaking the following measures:

- Ensure that the generation of dust is minimized and implement a dust control program to maintain a safe working environment, minimize nuisance for surrounding residential areas/dwellings and protect damage to natural vegetation, crops, etc.;
- Exposed soil and material stockpiles shall be protected against wind erosion and the location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors;
- To minimize the pollution caused by dust generation during the construction stage, water will be sprinkled on the construction site and on drive ways as frequently as possible;
- To minimize exhaust fumes, machinery and equipment shall not be running when not in use while ensuring that they regularly serviced; and
- Construction vehicles and machinery shall be equipped with pollution-control devices to minimize emissions.

Vibration and Noise Control

Vibration and noise produced by construction work will be manages as follows:

- The contractor shall strive to keep noise generating activities to a minimum;
- The contractor shall restrict all operations that result in undue noise disturbance to local communities and/or dwellings (e.g. drilling etc.) to daylight hours on weekdays;
- The contractor shall inform in advance any local communities and/or residents that could be disturbed by noise generating activities such as drilling or compacting and shall try to keep such activities to a minimum;
- The contractor shall be responsible for compliance with the relevant legislation with respect to noise;
- Provision of earplugs and earmuffs to the workers working in high peak noises during the construction stage.
- Use of modern low noise machinery and vehicles is recommended.

- Activities that may involve noises and vibration should be withheld at night especially close to human dwellings.

Landscape and Topography

As construction activities are very likely to lead to negative impact on landscape and topography at project site, such impacts will be brought to a minimum by executing the following measures:

- Planting of appropriate indigenous trees, grass cover and other vegetation types on project area should be encouraged so as to enhance scenic beauty of the area; and
- Removal and proper disposal of construction debris need to be effected after completion of construction works and shall not be stockpiled or deposited near or on water sources or other watercourse perimeter where they can be easily be washed away by high water or storm runoff or can any way enter these sources.

Occupation Health and Safety Measures

The following safety measure should be observed during the construction stage:

- Provision of health and safety induction course to all workers;
- Instilling proper code of conduct and work ethics among construction workers and ensure that they are observed;
- Provision of Personal Protective Equipment (PPE) to all workers and enforce their use;
- Installing first aid kit and hire trained personnel to provide first aid;
- Reporting to OSHA within 24 hours of occurrence of any accident or near miss which can cause fatal or permanent disability; and
- Workers should be educated on their own safety and safety of others;

Environmental Impacts during Operation Stage

Main environmental issues associated with Project operation are as follows.

- Health and safety issues for workers may arise during the project process e.g. Particulate matter may be generated during the project process, which may cause the health issues for the workers and noise of machinery can also be a negative impact on the health of workers.
- Waste water due to domestic and process activities.
- Fire due to short circuits and other activities.
- Solid waste generation due to domestic and project related activities.
- Noise pollution from generator and other machinery.

- Health hazards including the electricity hazards.
- Emissions will be generated from working of boiler.
- Ash from the boiler.
- Sludge from wastewater treatment facility will be generated.
- Vehicle access is required especially for transportation. The site is well served with the road network. Heavy traffic will be allowed only during tight time during operational phase. The traffic issues at any stage of project life cycle will not arise.

Impact significance: moderate to high or may be negative

Nature of impact: direct

Duration: Long-term

Timing: operational phase

Reversibility: NA

Likelihood: moderate to high

Consequences: moderate to high or may be negative

Methodology for Impact Evaluation during operational phase:

The methodology adopted for impact evaluation includes the Modified Leopold Matrix.

Leopold Matrix:

The analysis is performed with the Leopold Matrix (LM). This matrix has

1. On the horizontal axis, the actions which cause environmental impact, and
2. On the vertical axis, the existing environmental conditions which may be affected by those actions.

This provides a format for comprehensive review of the interactions between proposed actions and environmental factors.

The most important blocks marked are evaluated individually, and a number between 0 and 10 is placed in the upper left-hand corner to indicate the relative magnitude of the impact (0 represents the least magnitude, and 10 the greatest). Likewise, a number between 0 and 10 is placed in the lower right-hand corner to indicate the relative importance of the impact (again, 0 represents the least magnitude and 10 the greatest).

Sr. No.	Type of Impact	Scale of Magnitude (0 – 10)	Scale of Importance (0 – 10)
1	No Impact	0	0
2	Low Impact	1 – 4	1 – 4
3	Medium Impact	5 – 6	5 – 6
4	High Impact	7– 10	7– 10

Scale Table of Importance & Magnitude

Operational Phase															
Magnitude / Importance			Actions											Total Score of Impact	Average Score of Impact
			Transportation of raw material	Process Activities	Operation of Loaders	Water consumption	Wastewater generation	Storage of raw materials	Social activities	Public welfare	Economic activities	Employment	Infrastructure improvement		
PHYSICAL	Soil	Soil Quality	2 / 1	3 / 2	0 / 0	1 / 1	4 / 2	3 / 2	1 / 1	0 / 1	1 / 1	0 / 0	4 / 6	19 / 17	1.7 / 1.5
		Erosion	4 / 2	6 / 5	2 / 1	0 / 0	1 / 0	1 / 1	2 / 1	0 / 0	3 / 2	0 / 0	3 / 4	22 / 16	2 / 1.4
		Geomorphology	0 / 0	5 / 5	0 / 0	3 / 2	2 / 0	1 / 0	0 / 0	0 / 0	1 / 1	0 / 0	4 / 6	16 / 14	1.4 / 1.2
	Water	Surface Water	0 / 0	0 / 0	0 / 0	2 / 0	3 / 6	2 / 3	0 / 0	0 / 0	0 / 0	0 / 0	2 / 2	09 / 11	0.8 / 1
		Subsurface Water	0 / 0	1 / 2	0 / 0	7 / 8	3 / 3	1 / 1	0 / 0	0 / 0	1 / 1	0 / 0	1 / 2	14 / 17	1.2 / 1.5
	Air	Air Quality	5 / 7	7 / 8	1 / 1	0 / 0	0 / 0	1 / 1	2 / 2	0 / 0	1 / 1	1 / 1	3 / 4	21 / 25	1.9 / 2.2
		Odors	2 / 1	2 / 2	1 / 2	0 / 0	0 / 0	2 / 4	2 / 3	0 / 0	2 / 1	1 / 1	1 / 1	13 / 15	1.1 / 1.3
		Noise	5	7	7	0	0	2	5	0	5	4	4	39	3.6

			6	8	8	0	0	2	4	1	6	6	6	47	4.3
BIOLOGICAL	Fauna & Flora	Crops	1 / 1	2 / 2	1 / 1	0 / 0	3 / 5	2 / 2	2 / 3		5 / 7	3 / 3	3 / 3	22 / 27	2 / 2.4
		Birds	2 / 2	3 / 2	2 / 2	2 / 1	1 / 1	1 / 1	1 / 0	0 / 0	5 / 5	3 / 4	4 / 4	24 / 22	2.2 / 2
		Mammals	4 / 5	6 / 7	2 / 2	2 / 1	2 / 3	2 / 1	3 / 3	0 / 0	4 / 3	3 / 4	3 / 3	31 / 32	2.8 / 2.9
SOCIO-ECONOMIC	Social	Industrial	3 / 5	3 / 5	3 / 5	4 / 6	1 / 1	4 / 5	2 / 3	5 / 6	8 / 8	9 / 9	7 / 7	49 / 60	4.5 / 5.5
		Recreational Use	2 / 1	1 / 1	2 / 3	3 / 3	1 / 1	1 / 1	3 / 4	4 / 5	4 / 5	2 / 1	4 / 3	27 / 28	2.5 / 2.5
		Historical / Cultural	1 / 1	2 / 2	2 / 2	2 / 1	1 / 1	1 / 1	5 / 4	4 / 4	5 / 5	3 / 4	4 / 4	30 / 29	2.7 / 2.6

Over all the impact of project is positive in term of employment and infrastructure improvement. Mostly the average values are falling in 1.5 – 3 range which means the overall impact is low. To counter with the negative impacts Environmental Management plan is formulated which will be ensured by the project proponent. Beside this Environmental monitoring plan is also formulated for Environmental monitoring of various parameters which will be also implemented by the proponent

Recommendations

- Safety of workers should be ensured through proper training and PPEs must be ensured during the working hours.
- A well design firefighting system will be constructed to cope with fire situations in the subject project.
- Solid waste bins should be installed at designated processes and Installed Solid waste bins should be regularly cleaned and solid waste must be handed over to the third party
- Electricity monitoring/Thermography should be conducted by the proponent quarterly for the safe supply.
- Noise levels should not exceed the PEQS.
- Project proponent should submit all the monitoring reports in the EPA Punjab for the compliance of the PEQS.

Potential Environmental Enhancement Measures

The proposed project will be installed with all precautionary measures to enhance and safe the environment. Following necessary measures will be adopted during construction and operation:

- Sprinkling of water will be done on dusty roads and tracks.
- PPEs will be provided during construction activity.
- Constructional waste and domestic solid waste will be disposed-off or utilized properly.
- Local people will be informed in advance when work is about to start in an area.
- Machinery will never be left unattended.
- Efforts should also be made to discuss traffic conditions so that regular traffic is not disturbed. Transporters engaged for the project would be forced to adhere to the load specifications of the access road. No overloading would be allowed in any case.
- Safety signs and boards will be placed during construction.
- Machinery will be kept maintained.
- Proper SOPs will be followed with proper schedule along with the HSE conditions.
- Area will be restored with native plants. A proper tree plantation plan will be formulated to save the environment.
- Solid waste will be handed over to contractors and agreement will be made.
- Noise will be controlled by adopting proper measures.
- PPEs will be provided to workers during working.
- Firefighting equipment's and system will be installed.
- Safety signs will be placed at all locations where required.
- Hygienic conditions will be ensured and proper quality will be maintained by quality control testing.

CHAPTER # 5

ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM

Purpose and Objectives of the EMP:

The primary objectives of the EMP are to:

- Facilitate the implementation of the mitigation measures identified in the EIA.
- Define the responsibilities of the project proponent.
- Define a monitoring mechanism and identify monitoring parameters in order to:

1. Ensure the complete implementation of all mitigation measures.
2. Ensure the effectiveness of the mitigation measures.
3. Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
4. Identify training requirements at various levels.

Management Approach:

The overall responsibility for compliance with the environmental management plan rests with the project proponent.

A certain degree of redundancy is inevitable across all management levels, but this is in order to ensure that compliance with the environmental management plan is crosschecked.

Institutional Capacity

Following functionaries will be involved in the implementation of EMP:

- Project Proponent
- HSE/Project Manager
- In-Charge Administration
- Supervisor of project
- Environmental Engineer

Training Schedules

Training for the management/contractors/engineers and workers on environmental aspects of the project will be arranged on biannually basis during the constructional phase of the project

and on quarterly basis during the operational phase of the project. It will be imparted by a team of experienced trainers.

Training of building contractor

Training of building contractor & workers will be the part of the TORs regarding the construction of the scheme. The provisions given in EIA Report *Chapter 4 Screening of Potential Environmental Impacts & Their Mitigation Measures* will be followed.

TORs will be including the training and submission of reports in the following area:

1. Handling of Machineries in a safe way
2. Use of PPEs
3. Maintenance of vehicles and submission of Environmental Monitoring Reports
4. Maintenance of Water Consumption records
5. Testing of water and waste water and submission of Environmental Monitoring Reports
6. Placement of safety signs/boards during construction
7. Sprinkling of water on the roads and dusty tracks
8. Monitoring of generator emissions

Training regarding all other aspects of HSE will be ensured by the contractor during the construction phase.

Responsibility of EMP

Overall responsibility for implementation of EMP will be that of project proponent. He will appoint a HSE/Project Manager of relevant qualification. HSE/Project Manager will act as Environmental Manager and will manage all HSE condition at the PEQS.

Summary of impacts and their mitigation measures

Impacts	Mitigation Measures
Project Location	
• Acquisition of land • Loss of environmentally sensitive areas • Changes in traffic pattern • Potential conflicts with stakeholders • Resettlement issues	✓ There is not any sensitive area near the project site. ✓ Many other industries are also working near the project site. ✓ The project proponent will achieve the PEQS at the boundary walls of the subject project to avoid the environmental impacts on the nearby industrial unit. ✓ There is no need to change the traffic pattern due the development of the subject project because few industries have been developed at the same road. ✓ It is recommended to settle the issues through scoping and specific group discussions. ✓ No resettlement issues. ✓ It is recommended for obtaining of approval from other relevant departments.
Project Design	
• Soil structure and soil bearing capacity • Road infrastructure design • Emergency exits • Firefighting system • Wastewater disposal system design • Electricity hazards	✓ Safe road infrastructure design should be provided at the project site. ✓ Emergency exit points should be marked at the project site. ✓ Firefighting equipment must be maintained at the site in good working condition to cope with any emergency situation. ✓ Efficient wastewater disposal system should be designed for proper treatment of wastewater. ✓ Electricity system should be designed safe and sound.

Construction and Operation phase	
Land & Soil	
• Land or Soil Erosion during the construction phase • Habitat destruction • Scarring of the landscape and aesthetic beauty. • Clearing of native plants will disturb the complexity of the ecosystem of the proposed area. • Leakage of oil from storage area may contaminate soil	✓ Sprinkling of water is recommended ✓ After construction phase, the project proponent will restore the land by plantation. ✓ All spoils will be disposed of as desired and the site will be restored back to its original conditions ✓ Aesthetics of the area will be maintained. ✓ Oils, lubricants, chemicals, and other listed hazardous materials should be stored safely at their designated spots, enclosures or store rooms, which should be safe from rainfall and away from any potential source of fire (if any)
Air pollution and Dust emission	
• The transportation of the project machineries and material also may cause dust. • Un-metaled roads may cause dust. • Dust raised on dirt tracks by project-related vehicles. • Dust from drilling of deep holes. • Combustion products from vehicles used for project-related activities	✓ Air emissions-controlled devices must be installed to control the air pollution (if Required) ✓ Water the construction site periodically to minimize fugitive dust generation while laying foundation. ✓ Store all construction materials in a manner to minimize generation of dust and spillage on roads. ✓ During excavation works drop heights will be minimized to control the fall of materials reducing dust escape. ✓ Sprinkling of water must be done to control the dust or PM ✓ Vehicle emissions inspection should be done on regular basis ✓ Sprinkling should be done on the unpaved area to avoid dust pollution/ particulate matter. ✓ Vehicles/ trucks should be serviced regularly ✓ All project vehicles will be checked regularly to ensure that engines are in sound working condition and are not emitting smoke.
Noise	

• The major sources of the noise at proposed project site are project related machinery. • High noise level cause hearing loss, deafness, high blood pressure, headache, depression and mental disturbance. • Noise level will not exceed 75 dB(A) at the distance of 2 km radius, activity site is located at a safe distance from the nearest human settlement . • Noise from construction activities from site preparation, earth works, foundation and plant equipment installation	✓ Personal Protective Equipment PPEs including Ear muffs, Ear plugs and other noise abating equipment will be provided to the workers and other staff of the subject project. ✓ Proper maintenance and tuning of the vehicles should be done. ✓ Sound proof room should be built for generator (if any) to control the noise. ✓ A speed restriction of 40 km/h will be imposed on all construction vehicles.
Waste Water	
• Domestic waste water from the camp • Minor generation of waste water from construction activity. • Water Contamination due to improper storage of construction material, • Water contamination due to improper debris disposal, • Spread of diseases, underground water contamination	✓ Domestic waste water will be drained out in nearby local drain after treated in septic tanks ✓ Oils, lubricants, chemicals, and other listed hazardous materials should be stored safely at their designated spots, enclosures or store rooms, which should be safe from rainfall.
Solid waste	
• Solid waste may generate from construction activity, domestic and packing material of project related machineries.	✓ A solid waste management division should be formulated to deal with the proper disposal of solid waste, supervised by HSE Manager, SW Manager, and other related personnel.

• Solid waste may generate from operation of project.	✓ Solid waste generated from the construction activity as sand, stones residues etc. that should be utilized in restoration of the quarry area whereas solid waste from the domestic sources should be disposed off properly. ✓ Proper solid waste management system is recommended for each individual industrial unit. ✓ Industrial ecology practices will be adopted wherever possible. ✓ 7 R's of sustainability is recommended ✓ Sludge will be removed and dispose off in scientific way. ✓ Solid waste related to the operation will also manage in scientific way.
	Health and Safety
• Health and safety issues will be arose during construction activity, handling of material, machinery and improper practices of work • Health and safety issue may arise during regular operations	✓ Use of PPEs should be implemented at workplace. ✓ First aid measures/medical facility should be provided to project related employees. ✓ Safe drinking water must be provided to workers, staff, and poor people of the area. ✓ Water consumption records should be maintained. ✓ Safety signs & boards should be placed at during construction activity. ✓ Construction site should be fenced properly to avoid any damage to nearby settlements. ✓ Smoking or any drugs should be prohibited during working hours or performing work. ✓ At the time of earthwork, fencing will be ensured for the area under the exploration.

Equipment Maintenance Detail

The subject project is the proposed construction Knitting and dyeing unit, and effluent treatment plant under the name of M/s RELIANCE WEAVING MILLS LIMITED (). The company will maintain the records for Health Safety & Environment and will hire HSE manager to check and deal with the HSE issues. The company shall maintain PPEs, medical facilities, firefighting Equipment's as fire buckets, fire hydrants and fire extinguishers and records for their periodic fillings or replacement.

Type of Equipment	Type of Inspection	Schedule
Cranes – Crawler, Truck, Hydraulic, etc.	Complete inspection and certification	Before put to work and annually
	Critical items, controls, overall functioning	Daily
	Safety device, hooks, cables, electrical	Monthly
	Complete inspection	Every 3 months
	Repair	When failure occurs
	Preventative maintenance	Manufacturer's recommendation
Heavy Equipment	Complete inspection	Before put to work
Dozers, Backhoes	Complete inspection	Every 3 months
Compactors, Trucks	Repair	When failure occurs
	Preventative maintenance	Manufacturer's recommendation
	Operator's checklist	Daily
Miscellaneous	Complete inspection	Before put to work

Compressors, Welding Machines, Generators	Complete inspection	Every 3 months
	Repair	When failure occurs
	Preventative maintenance	Manufacturer's recommendation

ENVIRONMENTAL BUDGET

The cost which is required to effectively implement the mitigation measures is important for the sustainability of the Project in operation stage of the Project. Management will allocate 2% of total cost of the project as Environmental Budget for meeting the following purposes:

Table: Allocation of Environmental Budget

HSE training	On quarterly basis
Maintenance and management of environment	On regular basis
Maintenance of equipment	On regular basis
Restoration	As per requirement
Plantation	During the operation phase
Availability of PPEs	During construction and operation
Strategic planning to cope with any emergency	As per policy
Formulate the disaster management plan to cope with natural disaster	As per policy

Implementation of all these parameters will be included in the environmental budget. Any equipment failure will not be included in this budget.

CHAPTER # 6

STAKEHOLDERS PARTICIPATION

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

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

Objectives of Consultation

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

The important general objectives of the consultation process are:

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

Methodology of consultation:

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

- Selection of the stakeholders for consultation, reconnaissance of the proposed project site and initial discussions with the neighboring industry workers, villagers, shopkeepers, drivers etc.

- Environmental consultants and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

Proponent

Possible impacts and mitigation measures related to the subject project were discussed with the project proponent and management. They assured to take all suggested mitigation measures to control any discrepancy arose by the project and to make the project environmental friendly.

Responsible Authority

Management of M/s RELIANCE WEAVING MILLS LIMITED is the responsible authority to take all measures prior to start the activity.

Environmental Practitioners and experts

Team of M/s Pak Green Enviro-Engineering Pvt. Ltd visited the project site, had discussions with stakeholders and consulted with the local people of nearby and other villages to evaluate the project socio-economic impacts. People provide the massive information about the project and have positive remarks regarding the project development.

Other departments and agencies

For the impact analysis detailed meetings were held with the management of M/s RELIANCE WEAVING MILLS LIMITED local community, education institutes, health institutes, hospital and NGOs. Issues were discussed that may affect the environment and also the implementation of proposed project. All possible mitigation measures were considered and incorporated in the Environmental Management Plan.

Scoping sessions, focused group discussion and way side consultations were held with the relevant stakeholders in the area. The purpose of such consultations is to obtain the feedback from the relevant persons.

Affected & Wider Community

There is no affected community present in the radius of our study area. PGEE team has consulted with the inhabitants of the different villages. They provided positive remarks regarding the subject project and in the favor of the subject activity for the proposed plant. Stakeholders participation Performa's and socioeconomic questionnaire were get filled by the inhabitants to evaluate the project socio-economic impacts. List of respondents and socioeconomic questionnaires are attached as **Annexure-K** with the report.

Categories of stakeholders interviewed in the project area:

Stakeholder Category
Neighboring factory workers.
Nearby residents
Shopkeepers.
Drivers.

In addition to the above categories, authorities of administrative and educational institutions, commerce and Investment Department (C&I), Environmental Protection Department (EPD) etc. were also consulted for more effective participation and appraisal of the proposed project.

Issues Discussed:

Following issues were discussed during the stakeholder consultation:

- Overall activities of the project;
- Possible impacts on natural vegetation, air, land and properties;
- Possible mitigation measures;

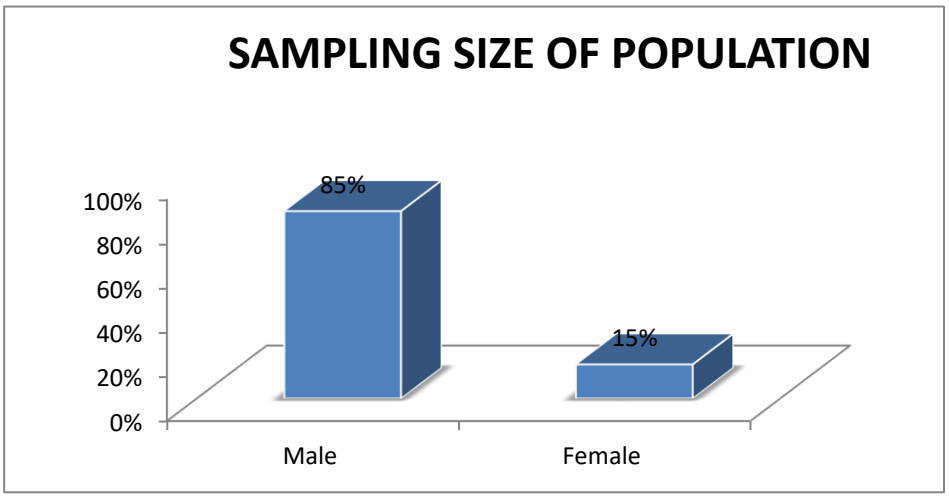
Sample size

Sample size of 40 respondents 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.

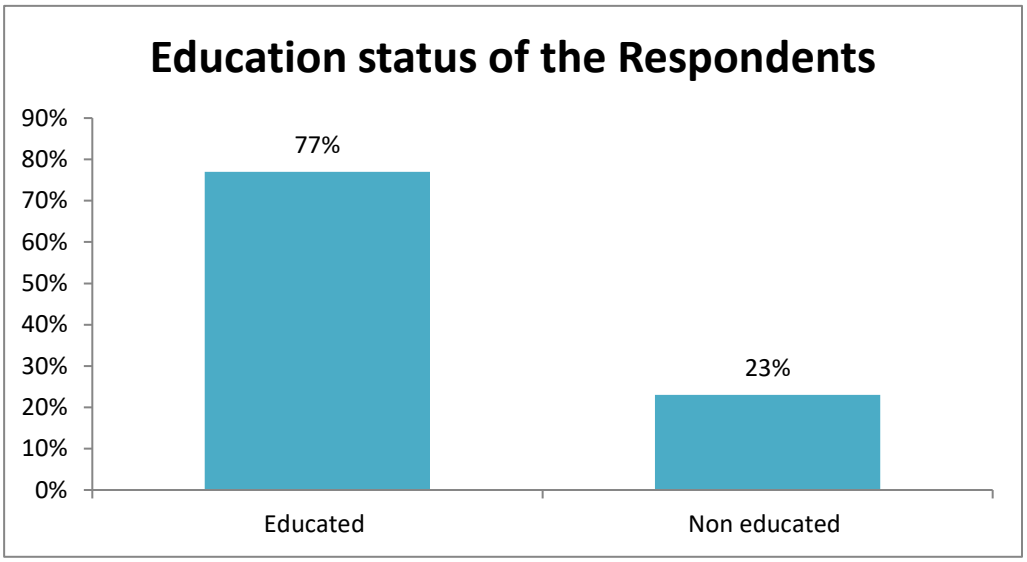
Statistical Analysis

SPSS 19.0 has been used for the statistical analysis of the data collected during the visit of study site area through questionnaires.

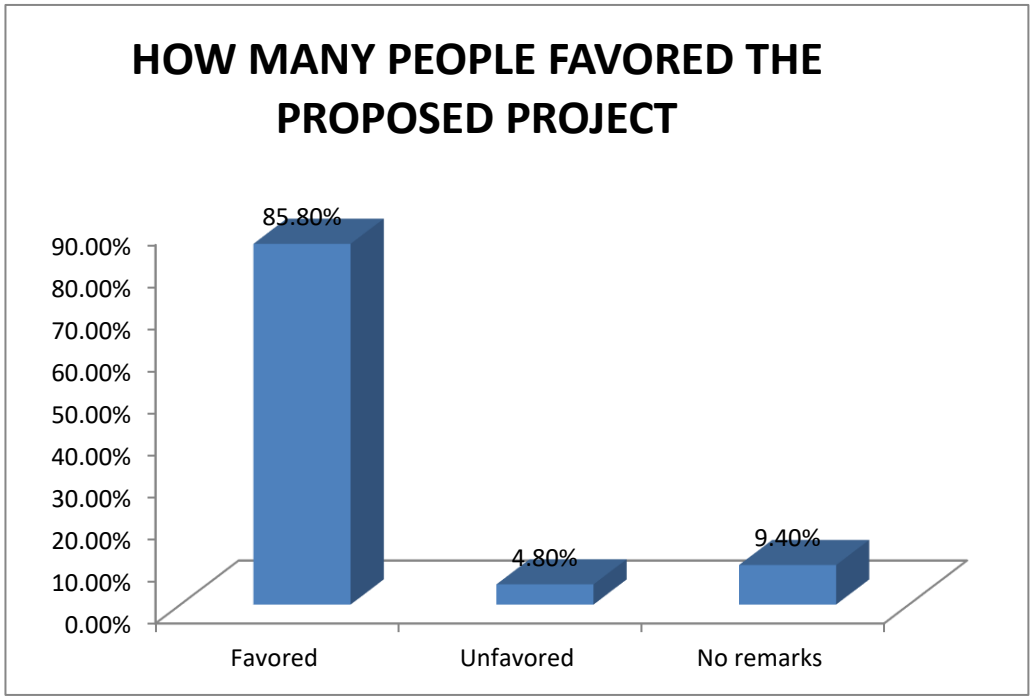
Graphical representation of analysis is given below:



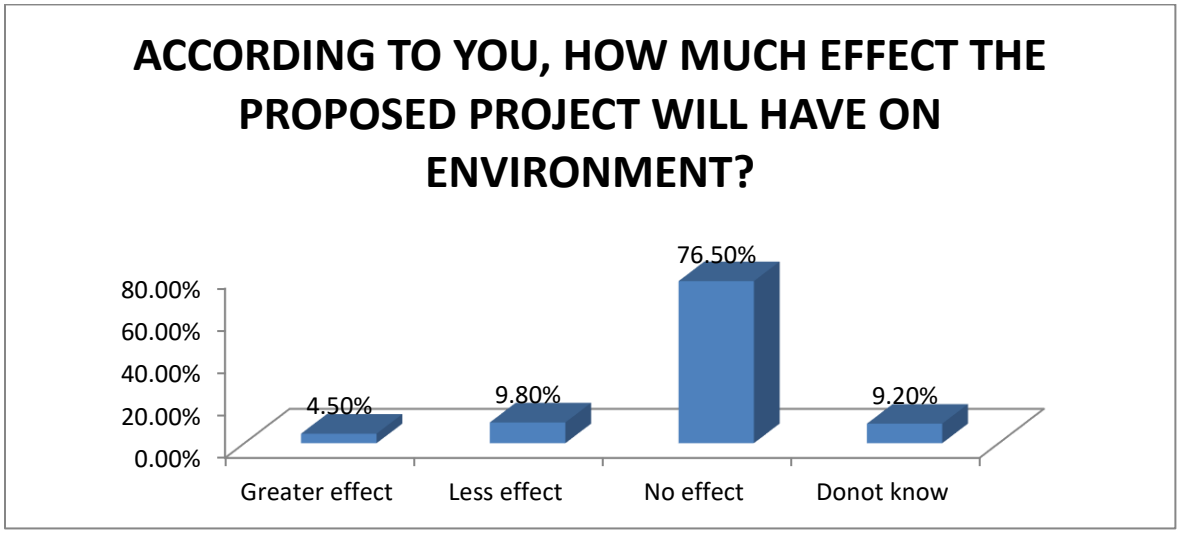
In the sampled population, 85% respondents were male while 15% respondents were female. The number of female respondents is less as compared to male respondents because according to the social binding female hesitates to respond or communicate comfortably.



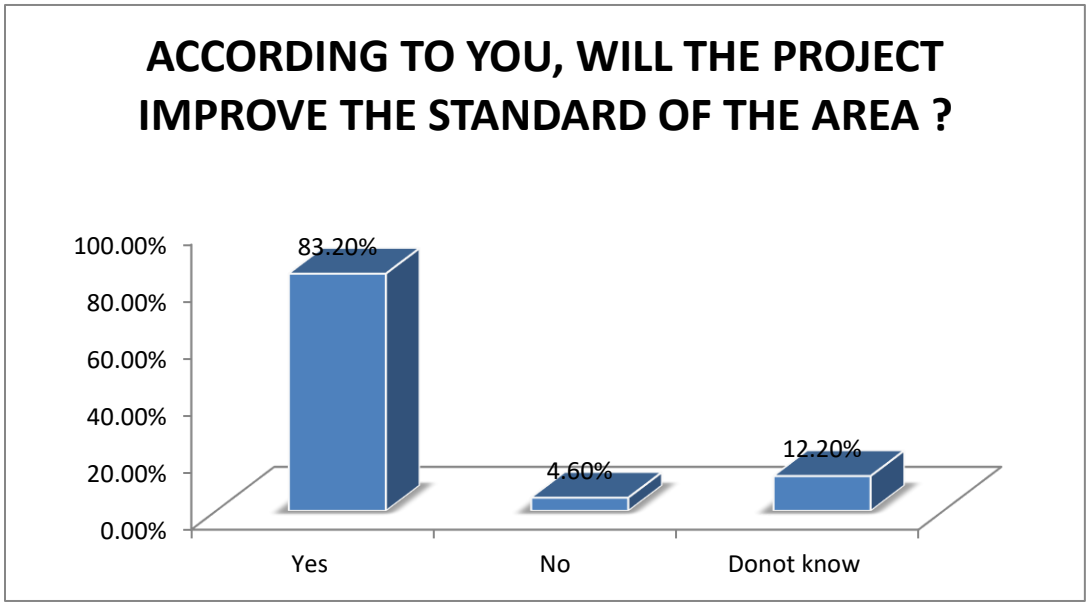
In the sampled population, 77% respondents were educated while 23% were uneducated. Overall education status of the area is good.



As per survey, 85.80 % people favored the proposed project and they gave positive remarks regarding the subject project. While 9.40% respondents had no opinion regarding the project and 4.80% respondents were not satisfied with the proposed project because they think that development will affect the natural aesthetics of the area.



As per survey, 4.50% respondents said that subject project will affect the environment of the area, 9.8% said that there will be less effect on the environment, 76.50% respondents said that the project will not affect the environment and 9.20% said that they have no idea regarding the subject project. Most of the population was not aware about the environmental importance; they were giving their remarks according to their own knowledge.



As per survey, 83.2 % people said that the project will improve the standard of the area, 4.60% said that it will have no impact on the area while 12.20 % respondents gave no remarks.

Findings of the Overall Discussion:

- After the completion of the proposed project the site will be used for industrial activities.
- It will enhance the socio-economic conditions/values of the area.
- Project will increase revenue generation for the Government.
- It will create employment opportunities.
- Local people will be given preference for employment in the proposed project.
- Construction of the proposed project will be completed in the designated timeframe to limit adverse impacts of construction.
- There will be no significant additional load on the existing infrastructure i.e. utilities of water, telephone, electricity etc. due to the development of the proposed project.

Majority of people favored the proposed project in a sense that the construction of the said project will generate employment opportunities for local people and revenue for the government, will enhance the socioeconomic conditions of the area and automatically will contribute to the national economy of the country.

Chapter # 07

Impact Assessment

Identification of all impacts:

All the impacts related to the subject project due to the project location, design, during the construction phase and operational phase have been identified and their mitigation measures have been suggested in *Chapter # 4, Screening of potential environmental impacts and mitigation measures.*

Methodologies for impact identification:

The methodology adopted for impact evaluation includes the Project Impact Evaluation Matrix.

Project Impact Evaluation Matrix

The impact Evaluation matrix was developed by placing project activities on x-axis and different environmental parameters likely to be affected by the proposed project actions grouped into categories i.e. Physical, Biological and Socio Economic Environment. For the impact assessment, project impact assessment matrix is used by dividing the project action into different phases (Construction phase and operation phase). A project impact evaluation matrix is attached in next section of this chapter.

The evaluation of impacts has been carried out on the basis of developing matrix, in which impacts have been rated on the basis of their significance. For rating impacts significance following criterion has been developed;

NA – Not Available
O – Insignificant (No or minimal impact)
LA – Low Adverse (Short term, reversible or less damage to environment)
MA- Medium Adverse (Long term reversible damage to environment)
HA – High Adverse (severe irreversible adverse damage to the environment)
LB – Low Beneficial (Short term benefits or less beneficial to the environment)
MB – Medium Beneficial (Long term benefits to environment)
HB – High Beneficial (Continuous benefits to environment)

	Physical Environment							Biological Environment		Socio-Economic Environment							
Environmental Component / Project Activities	Topography & Drainage	Soil Quality	Landscape	Surface water quality	Ground water quality	Air quality	Noise	Flora	Fauna	Agricultural Land	Health & Safety	Disruption of Public Utilities	Employment	Population Disturbance	Social Disorder	Cultural Values	Traffic Management
Placement of construction machinery on site	LA	LA	MA	LA	O	O	O	MA	LA	MA	LA	O	O	MA	LA	LA	HA
Parking of heavy vehicles	LA	O	LA	O	LA	O	O	LA	O	LA	LA	O	O	MA	MA	MA	HA
Transportation of raw construction material	LA	MA	MA	LA	O	HA	HA	MA	HA	LA	HA	O	MB	HA	HA	LA	HA
Temporary storage of raw material	LA	LA	LA	MA	LA	MA	O	LA	O	LA	LA	O	LB	LA	O	O	HA
Loading and unloading of raw material	LA	LA	MA	MA	O	HA	MA	LA	LA	LA	MA	LA	MB	HA	LA	O	MA
Labour camping on site	O	O	LA	LA	O	O	LA	LA	O	LA	LA	HA	O	HA	MA	MA	O
Storage of oil and fuel	LA	MA	LA	LA	O	LA	O	LA	LA	LA	MA	O	LB	O	O	O	O
Extraction of ground water	O	O	O	O	MA	O	O	MA	O	MA	LA	HA	O	O	LA	O	O
Construction material mixing/ preparation	LA	MA	LA	LA	LA	LA	HA	O	O	O	HA	HA	HB	MA	LA	MA	O

Welding/ cutting and steel fix ring process	O	O	O	O	O	MA	HA	O	O	O	HA	O	HB	MA	LA	LA	O
Shuttering/ beams	O	O	O	O	O	MA	HA	O	O	O	HA	LA	HB	MA	MA	MA	O
Building roofing	O	O	O	O	LA	MA	MA	O	O	O	HA	LA	HB	MA	LA	LA	O
Operation of generators	O	O	O	O	O	HA	HA	O	O	O	HA	LA	HB	LA	LA	O	O
Excavation	HA	MA	MA	LA	LA	HA	HA	MA	LA	O	HA	O	HB	LA	O	O	O
Water tank/ pond on site for temporary storage	O	O	O	LA	LA	O	O	O	B	O	LA	LA	B	LA	O	O	O

Legend:

O=Negligible/No impacts B=Beneficial LA=Low Adverse MA=Medium Adverse HA=High Adverse

	Physical Environment							Biological Environment		Socio-Economic Environment							
Environmental Component / Project Activities	Topography & Drainage	Soil Quality	Landscape	Surface water quality	Ground water quality	Air quality	Noise	Flora	Fauna	Agricultural Land	Health & Safety	Disruption of Public Utilities	Employment	Population Disturbance	Social Disorder	Cultural Values	Traffic Management
Transportation of raw material/ products	MA	MA	MA	MA	O	MA	HA	LA	MA	O	HA	LA	B	MA	LA	O	HA
Production process	O	O	O	HA	MA	MA	MA	O	O	O	HA	HA	HB	O	O	LA	O
Washing process	O	O	O	LA	HA	O	O	LA	LA	LA	LA	HA	B	O	O	O	O
Operation of boilers	O	O	O	LA	HA	MA	MA	O	O	O	HA	HA	HB	O	O	O	O
Operation of generators	O	O	O	O	LA	HA	MA	O	O	O	HA	LA	HB	O	O	O	O
Water consumption	LA	O	LA	HA	HA	O	O	LA	LA	LA	LA	HA	B	LA	O	O	O
Wastewater generation	HA	MA	MA	MA	MA	LA	O	MA	MA	MA	HA	LA	B	LA	LA	O	O
Storage of raw materials/ dyes	O	O	O	O	O	O	O	O	O	O	LA	O	B	O	O	O	O
Social activities	O	O	LB	B	B	B	B	B	B	HB	HB	B	HB	HB	HB	HB	O

Public welfare	O	O	B	B	B	B	B	B	B	HB	HB	HB	HB	HB	HB	HB	LB
Economic activities	LB	O	B	B	B	B	B	B	B	B	HB	B	B	B	B	B	LB
Employment	O	O	O	O	O	O	O	O	O	O	B	B	HB	B	B	B	LB
Infrastructure improvement	LB	MB	HB	B	B	B	B	HB	LB	HB	HB	B	HB	B	B	B	B

Legend:

O=Negligible/No impacts B=Beneficial LA=Low Adverse MA=Medium Adverse HA=High Adverse

Impact analysis and prediction:

In order to evaluate the socioeconomic and environmental impacts, filed surveys are extremely essential. In addition to the surveys at the preliminary stage, consultation with the community and their active participation plays a vital role in successful implementation of the project. For the impact analysis and predictions following methods were adopted:

Consultations/ case studies:

To study the impacts of the project on physical and biological environment, site visits were conducted by the environmental practitioners and experts and possible physical and biological impacts which may arise due to the subject project were identified through consultations and case studies and their mitigation measures were suggested accordingly.

Meetings:

For the identification of the social impacts of the project, meetings and group discussions were held with the local people, stakeholders, nearby residents and passerby because social acceptability of the project and the area is a key to success. Consultation with the stakeholders is a tool for managing two-way communication between the project proponent and the affected public. Its goal is to improve decision making and built understanding by actively involving individuals, groups and organizations, which have stake in the project. This involvement increases project's long term viability and enhances its benefits to locally affected people and other stakeholders.

To identity the different types of stakeholders and ascertain their perceptions about the project, an Environmental Impact Assessment study was conducted. Informal group discussions were also held as an additional tool for obtaining feedback from the stakeholders that are being discussed in the following.

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

- Selection of the stakeholders for consultation, reconnaissance of the proposed project site and initial discussions with the neighboring factory workers, villagers, shopkeepers, drivers etc.
- Environmental consultants and social specialists and documenting the opinions of the stakeholders expressed during the meetings etc.

Characteristics of impacts:

Impact assessment criteria:

The impacts were assessed in the light of criteria given as under:-

- Magnitude or degree of impact
- Time and duration of impact
- Likelihood of impact occurrence
- Sensitivity of impact
- Risk related to impact

Potential Positive Impacts:

The project is envisaged to have following major positive impacts;

Employment opportunities:

Proposed construction in existing building of M/s RELIANCE WEAVING MILLS LIMITED will help in generating new jobs for the local population. The requirement of Managers, Engineers, Workers, technicians, skilled and unskilled labor etc. will generate employment opportunities. It is estimated about more than 100 persons will be employed during operational phase and about 150 persons will work during construction phase. Hence, there is large number of employment opportunities especially for the locals of the district Lahore.

Increase in Business:

With the influx of laborers for the proposed project, there will be more opportunities for small scale business such as small food cafes etc.

Improved Infrastructure:

Proposed construction of ETP and proposed Knitting and dyeing unit within facility of M/s RELIANCE WEAVING MILLS LIMITED will improve the infrastructure of the area as proponent has incorporated aesthetic values and regeneration of site in its planning stage.

Economic benefits:

M/s RELIANCE WEAVING MILLS LIMITED is a major textile unit in the country; it is a great investment for the economy of our country. In the long run it will positively impact not only the local population but also the economy of Pakistan.

Potential Negative Impacts:

Types of Negative Impacts

Minor Impacts

These are of minor intensity. For mitigation of the minor impacts routine and limited actions are required.

Moderate Impacts

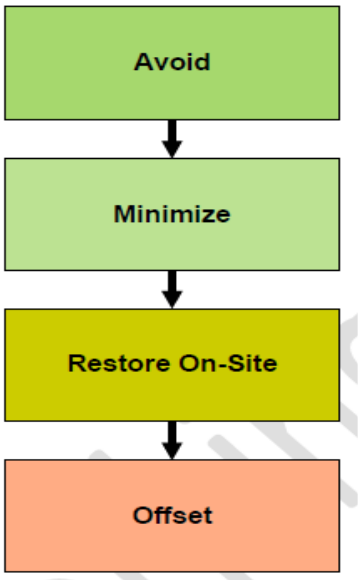
These impacts need specific and additional mitigation measures.

Major Impacts

These impacts have severe adverse impact. These are intolerable. All possible preventive and multiple control measures are adopted to minimize their intensity and duration.

Mitigation assessment criteria:

The Mitigation Hierarchy establishes a structure to guide development and application of measures to mitigate impacts on environmental values and associated components. The term "mitigation" applies to four steps, or levels, in the mitigation hierarchy:



General principles

1. Maintaining the integrity and natural functions and processes of ecosystems, and the resilience of ecosystems, is prerequisite to sustainable use of natural resources, and essential to maintaining ecosystem goods and services over time.
2. The mitigation hierarchy is applied in order of priority as follows:
    a. Avoid
    b. Minimize
    c. Restore On-Site
    d. Offset (Off-Site or On-Site)
3. Generally, the "higher" the priority of the environmental value and associated component, the more protective the mitigation measures.
4. For an action or measure to be considered "mitigation", a party must accept responsibility for implementation of appropriate mitigation measures, and there must be certainty that the mitigation measures will be carried out.
5. Implementing mitigation measures can help resolve issues that may delay or prevent a proposed project or activity.

General considerations

1. Which environmental values and associated components will be impacted by the proposed project or activity? (This will be determined from the output of the environmental impact assessment, i.e., the Environmental Impact Assessment and Mitigation Plan)
2. Have the criteria being used to determine relative priorities among environmental values and associated components?
3. Have mitigation measures for impacts on environmental values and associated components, at all scales, been considered?
4. What is the current condition of each environmental value and associated component actually present within the footprint and area of influence of the proposed project or activity?
5. Can impacts on one or more environmental values or associated components be more fully mitigated than impacts on other environmental values and associated components?
6. Are there multiple environmental values and associated components with conflicting management needs and potential conflicts that need to be considered?

7. Is sound guidance available and being used, e.g., are best management practices (BMPs) and guidelines available for affected environmental values and associated components?
8. Is there opportunity to collaborate with other proponents that may have interest in overlapping mitigation measures?

Impact significance of:

- ***Ecological importance***

Natural Vegetation

Project activities do not impose any potential impact on the area's natural vegetation and plantation.

Assessment of Impact:

A significant impact will be interpreted if unnecessary or excessive removal and burning of plants for fuel wood is observed. In case of subject project no tree cutting will be required for the construction of the subject project.

Nature of impact: Direct

Duration: long term

Timing: construction phase

Reversibility: irreversible

Likelihood: moderate

Consequences: Mild, as no rare plant species are not present in the project area.

Impact significance: significant

Mitigation Measures:

The following mitigation measures will reduce any impact on vegetation:

- Do not park vehicles on green belts/ grass
- Unnecessary damage to vegetation will strictly be avoided.
- Proponent will plant trees and other species after construction phase

Residual Impact:

Given the current state of the vegetation, and proper implementation of the proposed mitigation measures, slightly significant residual impact on the natural vegetation of the area is anticipated.

Fauna

The fauna including wildlife species do not exist at the project site**.**

Nature of impact: Direct

Duration: short term

Timing: construction phase

Reversibility: not applicable

Likelihood: low

Consequences: Nil, as no rare plant species are not present in the areas.

Impact significance: not significant

Residual Impact:

Given the current state of the fauna there is no significant residual impact on the wild life of the area.

- ***Social importance***

Following parameters were adapted for the assessment of the well-being of the poor people near the project site that are used to assess the social, economic, and cultural impacts of the project.

Inconvenience due to construction Vehicles:

During the construction period a minor impact may be the movement of vehicles from the main road to the proposed plant boundary; it may affect the traffic on other roads and may cause minor annoyances to the residents and other industrialists of the area. The transportation of heavy materials and equipment is likely to damage the existing roads if they were used for the transportation of heavy machinery.

Mitigation measures: Efforts should also be made to discuss traffic conditions so that regular traffic is not disturbed. Transporters engaged for the project would be forced to adhere to the load specifications of the access road. No overloading would be allowed in any case.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: reversible

Likelihood: low

Consequences: low, as it links the main Multan road and vehicles will rarely use the sub roads

Impact significance: slightly significant

Cultural Issues:

Induction of outside workers in the Contractor's labor may cause cultural issues with the local community as the local community is very sensitive about their cultural values. Also theft problems to the local community may arise by the labor force and vice versa.

Mitigation Measures: Good relations with the local communities will be promoted by encouraging contractor to provide opportunities for skilled and unskilled employment to the locals, as well as on-the-job training in construction for young people. Project manager will restrict his staff to mix with the locals to avoid any social problem.

Contractor will keep the copies of Computerized National Identity Cards (CNIC) of his workers and will warn them not to involve in any theft activities. And if anyone would involve, he will have to pay heavy penalty. Similarly, at the time of employment contractor has to take care that the workers should be of good repute. The contractor camp will be properly fenced and main gate will be locked at night with a security guard to check the theft issues.

Contractor will also be the responsible for the sensitivity towards the local customs and traditions.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: reversible

Likelihood: low

Consequences: low, if project proponent implements mitigation measure, its impact will be low

Impact significance: slightly significant

Accident risks:

Unmonitored construction activities may create an accident risk for the local residents particularly children and labor force.

Mitigation measures: Contractor must have first aid kits along with the medical officer in the field if a minor injury takes place, but for an unfortunate accident services of nearby hospitals will be availed. Routine medical check-ups of all the field staff including unskilled labor need to be conducted by a qualified doctor.

Training of the workers should be arranged regarding safety procedures, environmental awareness, equipping all construction workers with PPEs, safety boots, safety helmets, ear plugs, gloves and protective masks. Monitoring must be carried out to check for the sustainable use of PPEs.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: not applicable

Likelihood: moderate

Consequences: moderate, as complete trainings and mitigation measure have been planned.

Impact significance: significant

Privacy Issues:

Disturbance may happen to the privacy of women residing in the work area when workers will work at height.

Mitigation Measures: Contractor must take care for the privacy of residents, especially women near the working area.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: reversible

Likelihood: low

Consequences: low, as contractor will take care of the matter

Impact significance: slightly significant

Sharing of resources:

During the construction and operational phase of the project, workers will share the common resources like potable water, fuel, wood. It may create conflicts between work force and local population.

Mitigation measures: The contractor will be required to maintain a close friendly relationship with the local communities to ensure that there may not be any conflict related to common resources utilization. He must get permission of the local population before using their common sources of water and other resources.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: reversible

Likelihood: low

Consequences: low, it the terms & conditions will be followed and mitigation measures have been employed

Impact significance: significant

Noise Problems:

Residents of the area and neighbors may face the problems of noise during the construction and operations phase.

Mitigation measures: Large noise generating activities should be carried out in fixed hours. The timing will be known to all the people in 500 m radius of the site.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: reversible

Likelihood: Moderate

Consequences: Moderate, project contractor will follow the safety guidelines & PEQS

Impact significance: significant

Mobilization issues:

During the construction phase, the general mobility of the local residents and their livestock in and around the study area is likely to be hindered.

Mitigation measures: It will be the responsibility of project contractor and drivers to follow the speed limits in the area.

Nature of impact: Direct

Duration: Short term

Timing: construction phase

Reversibility: reversible

Likelihood: low

Consequences: low, as it links the main Multan road and vehicles will rarely use the sub roads

Impact significance: slightly significant

Health:

People from the project area regularly travel to other cities, and thus cannot be considered isolated from the rest of the country. They are regularly exposed to illnesses common to urban populations, and have similar levels of immunity. The project is therefore very unlikely to lead to an epidemic of any sort among local communities.

Mitigation measures: Regular medical check-ups of all the workers need to be conducted to ensure the health of workers and local population.

Nature of impact: Indirect

Duration: Long term

Timing: construction / operation phase

Reversibility: reversible

Likelihood: moderate

Consequences: low to moderate, it may cause disturbance or spread of disease in the area if mitigation measure will not followed

Impact significance: significant

Safety:

Project activities could become a hazard as it is located in populated area local people, especially children, are likely to gather around to watch the activity. The other safety issue is that of traffic, especially along access roads close to settlements. To reduce the hazards, the following mitigation measures will be implemented:

- Local people will be informed in advance when work is about to start in an area.
- This may result in people keeping young children away from work areas.
- Machinery will never be left unattended.
- Safe driving practices will be adopted, particularly while passing through settlements.

Nature of impact: Direct

Duration: long term

Timing: construction / operation phase

Reversibility: irreversible

Likelihood: moderate to high

Consequences: moderate if all safety measure will be taken care

Impact significance: Significant

- ***Environmental standards***

Topography:

The project will not change the topography of the area as proponent committed to sustainable development of the proposed project. The infrastructure of the area will be maintained after the construction activities.

Residual Impact:

The residual impact of project activities on the topography of the area is expected to be insignificant.

The residual effects are summarized below:

Nature of impact: direct

Timing: construction Phase

Duration: during construction activities

Likelihood: Nil

Consequences: no change

Impact significance: Not significant

Mitigation measures:

The project design should include measures to maintain the project landscape that matched the pre project natural green features achievable through extensive plantation. Project activities must be executed in a way it will not harm naturally available resources.

Land Acquisition Resettlement:

One of the major impacts includes acquisition of land from the land owners and the resulting displacement of their families and disturbances in the livelihood of the affected persons (AP) in the project area. But present project land is ownership of M/s RELIANCE WEAVING MILLS LIMITED and do not involve any type of land acquisition and resettlement activity.

Residual Impact:

The residual impact of project activities for the land acquisition & resettlement of the area is expected to be insignificant.

The residual effects are summarized below:

Nature of impact: direct

Timing: Planning stage

Duration: not applicable

Likelihood: Nil

Consequences: no change

Impact significance: Not significant

Mitigation measures:

If any resettlement involve, proponent must consult the affected persons and incorporate their interests and demands.

Changes in Land Use:

The current land use of the area is mainly industrial. Project is expected to increase land use value particularly near the main road creating easy economic and employment opportunities for locals.

Residual Impact:

The residual impact of project activities on land use of the area is expected to be insignificant.

The residual effects are summarized below:

Nature of impact: direct

Timing: construction phase

Duration: not applicable

Likelihood: Nil as it is not involving any constructional activity that may cause change in land use

Consequences: no change

Impact significance: Not significant

Mitigation measures:

The impact of change in land use must incorporate in planning stage so that it may not cause any hindrance during the constructional phase.

Solid waste/ sludge management:

Proper solid waste management system is necessary for the prompt, timely and efficient disposal of solid waste & sludge for the reduction of its impacts. Impacts due to solid waste & sludge are expected to be temporary and minor in nature.

Nature of impact: Direct

Duration: Short term

Timing: operation/ construction

Reversibility: Not applicable

Likelihood: Low (unlikely) as mitigation measures will ensure that Solid waste management will be efficient

Consequences: Mild, as it will be removed from site within few hours

Impact significance: Low, based upon low likelihood and mild to moderate consequence.

Mitigation measures:

- Planning of solid waste disposal sites with reasonable distance from the human settlements
- A minimum distance of 1 km should be maintained between the solid waste disposal site and nearest human settlement
- Devise plan & develop guidelines for the safe handling, storage & disposal
- Sludge must not be placed at the site after cleaning of wastewater treatment tank
- PPEs are strongly recommended for workers for the handling of sludge

Residual Impact:

After implementing the mitigation measures listed above, the residual impact of the solid waste/ sludge is expected to be insignificant.

Air Quality Potential Impact:

Air emissions from project-related activities are likely to include:

- Dust raised on dirt tracks by project-related vehicles.
- Combustion products (nitrogen oxides, sulfur dioxide, particulate matter, carbon monoxide, and volatile organic compounds) from vehicles used for project-related activities

Assessment of Impact

1) Dust Emissions:

Dust emissions caused by vehicular traffic on dirt track are an important concern, primarily when such traffic passes near community settlements. Dust emissions cause the amount of particulate matter in the air to increase, and thus become a health concern. Dust clouds also reduce road visibility, creating a traffic hazard.

2) Gaseous Emissions:

Emissions produced by vehicles and equipment will be similar to those produced by generators in terms of the resulting pollutants (SO_2, NO_X, PM, etc.). However, the extent to which they are produced will be kept considerably lower, since much smaller engines are used in vehicles and construction machinery.

Nature of impact: Direct

Duration: long term

Timing: operation/ construction

Reversibility: irreversible

Likelihood: moderate as mitigation measures will ensure that air pollution remains within acceptable limits.

Consequences: moderate, as pollutant levels in the ambient air will be well within acceptable limits.

Impact significance: moderate, based upon low likelihood and mild to moderate consequence.

Mitigation Measures

None of the potential effects discussed above are expected to exceed acceptable limits.
The mitigation measures given below will further reduce their impact, and ensure that they remain within acceptable limits.

- All equipment and vehicles used during the project will be properly tuned and maintained in good working condition in order to minimize exhaust emissions.
- Vehicle speed will be reduced on track passing through or close to shops
- Imposing speed limits and encouraging more efficient journey management will reduce the dust emissions produced by vehicular traffic. Water will be sprinkled where necessary to contain dust emissions.
- Management will make sure process is environmental friendly

Residual Impact:

After implementing the mitigation measures listed above, the residual impact of the proposed activities on ambient air quality is expected to be low.

Noise level:

Noise may be a major concern during the construction/ operation phase. It can be generated from the machinery used for construction and operations. Generators and boilers are another source of noise pollution.

Nature of impact: Direct

Duration: long term

Timing: operation/ construction

Reversibility: Not applicable

Likelihood: moderate

Consequences: slightly significant, if above mentioned mitigation measure will be strictly followed

Impact significance: moderate, based upon low likelihood and mild to moderate consequence.

Mitigation measures:

- Keep the traffic load aligned and minimum during working hours of project
- Machinery and vehicles must be well tuned and maintained
- Impose the limits on unnecessary use of horns
- Safety signs must be displayed and public & drivers must be well aware of them
- Do not work in night time

Residual Impact:

After implementing the mitigation measures listed above, the residual impact of the noise level will be slightly significant.

Conclusion

Management of M/s RELIANCE WEAVING MILLS LIMITED has to achieve the following goals.

- Identification of regulatory requirements that apply to the project activities in the context of environmental protection.
- Identification of the environmental features of the project area and the likely impact of the project on the environment,
- Recommendation of appropriate mitigation measures that management will incorporate into the project implementation to minimize all adverse environmental impacts.
- Baseline environmental and socioeconomic information collection from a variety of sources, including field surveys.

The impacts of project in area will be insignificant, provided the generic mitigation measures proposed in this report are implemented.

After assessing the project activities and investigating the project area, it is concluded that, if the activities are undertaken in this report, and the recommended mitigation and environmental management measures are adopted, the project will not result in any long-term or significant impacts on the local community or the environment.

Chapter # 08

Mitigation and Impact Assessment

Purpose of Mitigation measures

What is the problem i.e. in terms of "major environmental impacts" which may arise by the subject project activity?

The major impacts may arise by the subject project include particulate matter & dust, noise, solid waste and wastewater. Other impacts are of minor importance. These impacts will arise during construction and operation but precautionary measures will be adopted prior to start the activity, during the activity and post activity.

When the problem will occur and when it should be addressed?

Any impact that would arise due to the subject project activity will be addressed on site. Trainings will be conducted on site prior to start work while other precautionary measures will also be adopted to make the project safe and environmental friendly.

Where and how the problem should be addressed?

HSE manager/environmental manager along with site manager will be appointed to assess any impact that could be arisen during both phases. He would be responsible to address the problem and to mitigate it.

Whys of achieving mitigation measures

Changing in planning and design:

By adopting proper mitigation measures, any anticipated major or minor environmental impacts could be controlled or mitigated. The details of impacts and mitigation measures have been discussed in previous chapters.

Improved monitoring and management practices:

Management of M/s RELIANCE WEAVING MILLS LIMITED shall take appropriate measures to provide pollution free and safe environment during the proposed project activity by implementing improved management practices and monitoring techniques suggested in EMP.

Compensation in money terms:

M/s RELIANCE WEAVING MILLS LIMITED will adopt such plan that will assure the minimum impact on the environment and health by implementing proper mitigation measures. Design of the project will assure the structure stability and project life in a long run.

Replacement, relocation and rehabilitation:

M/s RELIANCE WEAVING MILLS LIMITED will develop Restoration/ reclamation or tree planation plan to restore the project area. Maximum Plantation will be done with native species within the building, along the boundary wall and along the road side if directed by EPA. Also, in-front of main area, horticulture plan will be formulated and area for this will be kept reserved.

ENVIRONMENTAL MANAGEMENT PLAN OF M/s RELIANCE WEAVING MILLS LIMITED

Serial No.	Environmental Parameter/ Element	Mitigation measure/Enhancement Measures to be taken during:		
		Construction	**Regular operations**	**Responsibilities**
	Gaseous/ Dust emissions	**1-** Control speed of construction vehicles **2-** To minimize dust generation water should be sprinkled on the construction site and on drive ways as frequently as possible. **3-** Regular maintenance of equipment. **4-** People who are working and exposed to severe dust and exhaust fumes should be provided with PPEs. **5-** The use of low sulphur fuels in construction equipment and ensuring proper vehicle and equipment maintenance. **6-** Construction vehicles and machinery shall be equipped with standard	1- Management of RELIANCE WEAVING will ensure that PPEs i.e. masks will be provided to workers during the working hours. 2- Vehicles to be used for the transportation of raw materials at the project site should be properly tuned. 3- Generator shall cater for emergency situation only. Their exhaust will be emitted through an adequately fabricated stack. It will also be ensured that the generators will only function during emergency condition for limited period.	**HSE/Environment Manager**

		pollution-control devices to minimize emissions. **7-** Civil debris, if generated during construction phase, shall be disposed in low-lying areas for land filling. **8-** Construction materials i.e. sand, clay should be transported to the project site in covered trucks. **9-** All project vehicles should be checked regularly to ensure that engines are in sound working condition and are not emitting smoke. **10-** Construction materials i.e. sand, clay and like shall be transported to the project site during night time and will be stored away from the road or foot path. They will be kept under cover to avoid any fugitive dust.	4- Monitoring should be conducted on as per EPA PEQS Rules.	

		11- The site proposed for the construction of M/s RELIANCE WEAVING MILLS LIMITED () is located away from human settlements. **12-** All equipment, generators, and vehicles used during the project construction will be properly tuned and maintained in good working condition in order to minimize exhaust emissions.		
	Noise	1. Ensure Noise level compliance according to Rules and Regulation 2. Ensure all construction machinery are maintained and serviced in accordance with the contractor's specifications 3. Ensure exhaust mufflers and engine enclosures are in place and in good working order for all construction equipment and industrial trucks.	1- All activities will be under PEQS level of noise during operation phase. 2- PPEs i.e. ear muffs should be provided to workers in case of high noise. 3- Ensure all production machinery are maintained and	**HSE/Environment Manager**

		4. Ensure Noise generation activities to be relegated during daytime. 5. Ensure that vehicles undergo routine maintenance 6. Notifying the neighbor in case there would be some noisy events. 7. Ear plugs will be provided & implemented in case of heavy noise.	serviced in accordance with its specifications.	
	Health & safety	1- Workers/people will be informed in advance when work is about to start at the project site. 2- Machinery will never be left unattended. 3- Safe driving practices will be adopted, particularly while passing through human settlements. 4- Basic health facilities will be provided to workers.	1. The EMP guidelines will be followed strictly (committed by the management of RELIANCE WEAVING). 2. Training of workers will be conducted regarding health and safety. 3. PPEs will be provided and implemented. 4. First aid measures will be provided to workers.	**HSE/Environment Manager**

		5- Construction worker safety shall be in accordance with site specific health and safety plan that identifies site specific risks, safety equipment, action plans, and hospital locations. 6- Daily site inspections should be done to ensure safe work practices. 7- All workmen should be provided with personal protective equipment.	5. Shift Rotation, proper ventilation will be provided to workers in case of thermal stress. 6. Safety signs, safety boards, exit arrows etc. will be placed on site. 7. An Assembling point will be kept to gather in case of emergency situation such as fire hazards. 8. Floors will be kept clean without slippery to avoid any hazard. 9. Firefighting system will be installed to avoid any health hazards. 10. Electrical wires, D.Bs will be kept covered to avoid electrical hazards. 11. Machinery will never be left in running condition.	
	Soil and water pollution	Prevention of accidental oil or chemical spillage, solid matters, contaminants, debris and	1- Water pollution will not be created by this proposed unit.	**HSE/Environment Manager**

		other pollutants and wastes from entering into surface and ground water. Awareness on environmental protection. Avoid deposition of stockpiling materials near or on stream banks or other watercourse perimeter. No grey water runoff or uncontrolled discharges from the site/working areas (including wash down areas) without treatment shall be permitted. Water containing pollutants such as cement, concrete, lime, chemicals and fuels shall be discharged into a conservancy tanks for removal from site. Contractor must dispose solid wastes away from the site to an approved disposal site. Potential pollutants (If any) of any kind and in any form shall be kept Stored and used in such a manner that any escape can be contained and the water table not endangered.	2- Spills during construction or operations shall be absorbed with absorbent blankets, socks, or absorbent material and disposed of in accordance with applicable laws and regulations.	

		Equipment Storage or wash areas shall be placed and constructed in such a manner so as to ensure that the surrounding areas (including groundwater) are not polluted. During construction, standard engineering practices such as silt fencing, erosion control material, and construction tracking pads should be implemented to control runoff, erosion, and sedimentation that could affect watersheds. Proper handling and storage procedures for hazardous wastes e.g. fuel oil should be stored in areas with hard standing and containment to handle spills. Minimize waste production by utilizing best available techniques for site preparation.		
5.	Generation of domestic & project process related solid waste	1. Waste management on site shall be strictly controlled and monitored. Only approved waste disposal methods shall be allowed.	1. Domestic, process related solid waste and sludge will be stored in solid waste bins and will be handed over to certified contractors.	**HSE/Environment Manager**

		2. Ensure that all site personnel are instructed in the proper disposal of all waste. 3. Ensure that all facilities are maintained in a neat and tidy condition Measures shall be taken to reduce the potential for waste and negligent behavior with regard to the disposal of all refuse. 4. At all places of work provide bins, containers and refuse collection facilities for later disposal. 5. Solid waste may be temporarily stored on site in a designated area prior to collection and disposal. Waste storage containers shall be covered, tip-proof, weatherproof and scavenger proof. 6. No burning, on-site burying or dumping of waste shall occur. 7. All solid waste shall be disposed of offsite at an approved landfill site.		

		8. The HSE Officer shall provide metal refuse bins or equivalent plastic refuse bins, all with lids, for domestic waste. Refuse shall be collected and removed from all facilities at least twice per week. 9. Construction waste will be utilized for landscaping, road repairing and maintenance purposes.		
6.	Waste effluents	1- The waste water to be generated from domestic/constructional sources should be treated in site camp septic tank and then it should be disposed off.	1. The sewage to be generated shall be treated in the wastewater treatment facility and then will be drained out in the nearby drain or used for irrigation purposes.	**HSE/Environment Manager**
7.	Water supply	1- It shall be ensured that no activity tempers with the water supply system and water availability	1. It shall be ensured that no activity tempers with the water supply system and water availability	**HSE/Environment Manager**

8.	Soil erosion/Land Degradation	1. The project site has few and scattered amount of vegetation which will not be removed. 2. The land is almost clear and free of dense vegetation. 3. Every care shall be taken to check soil erosion 4. Landscaping 5. Ensure management of excavation activities 6. Provide soil erosion control and conservation structures where necessary 7. In areas where construction activities have been completed and where no further disturbance would take place, rehabilitation and re-vegetation should commence as soon as possible. 8. Ground clearance should be minimized and if possible concentrated only to the specific building foundation areas, and only when it is necessary.	1. Plants will be planted during operation phase of the subject textile mill	**HSE/Environment Manager**

		9. Prompt reclamation of exposed soils should be done. 10. Construction during long rains period should be done with caution to avoid soil from being washed away. 11. Topsoil excavated from buildings foundations should be stored for re use on other areas for rehabilitation		
9.	Enhancement of aesthetic beauty of the building and the area.	------	1- Flower pots containing flowers and plants will be provided in front of the building to add to the improvement of the environment around. 2- All other necessary measures will be taken to maintain standards of cleanliness so that the building may add to the scenic/aesthetic beauty of the area around.	**HSE/Environment Manager**

10.	Staff for catering the Environmental Management Plan	---	1- Special staff will be recruited to implement this Environmental Management Plan on regular basis.	**HSE/Environment Manager**

CHAPTER # 9

CONCLUSION AND RECOMMENDATIONS

Based on the study conducted for Environment Impact Assessment (EIA) for the subject project, the following conclusions are made:

Conclusions

- The EIA study reveals that the project is economically viable, socially acceptable and environment friendly.
- It will generate additional jobs during construction and operation phases.
- The proponent has committed to implement the project in the environment friendly manner.
- M/s RELIANCE WEAVING MILLS LIMITED intends to register the project with local Government.
- M/s RELIANCE WEAVING MILLS LIMITED has prepared and implemented very comprehensive Emergency Preparedness and Response Standard Operating Procedures.

Recommendations

- In view of the comprehensive screening process and findings of the present study there is no need of conducting further investigations.
- Tree plantation inside the unit and near the unit is recommended.
- The untreated wastewater will not be reused for irrigating the vegetation and lawns.
- High standards of bio-security and safety will be enforced during operation stage. Safety of the workers will be top priority for the management.
- The management of M/s RELIANCE WEAVING MILLS LIMITED () will continue to assist the local communities as a corporate/social responsibility.
- The present EIA report is enough to meet the administrative and legal framework. Therefore, the environmental approval may be accorded for the present project