ENVIRONMENT IMPACT ASSESSMENT

(EIA)

DIAMOND FABRICS LIMITED

Environmental Impact Assessment Report

Extension of load 10MW to 18MW at 132KV AIS Grid Station at Diamond Fabrics Limited

Diamond Fabrics Limited, At Faisalabad Road, Sheikhupura.

REPORT SUBMITTED BY:
Proponent: Mr. Ameer Abdullah

Mailing Address: Diamond Fabrics Limited, At 26km-Faisalabad Road, Sheikhupura.

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EXECUTIVE SUMMARY 5
TITLE & LOCATION OF THE PROJECT 5
LOCATION 5
NAME OF ORGANIZATION PREPARING THE REPORT: 7
THE MAJOR IMPACTS 8
RECOMMENDED MITIGATION MEASURES 9
TABLE: SUMMARY OF ENVIRONMENTAL AND SOCIAL IMPACTS OF THE PROJECT DURING THE CONSTRUCTION PHASE AND MITIGATION MEASURES SUGGESTED: 10
TABLE: SUMMARY OF ENVIRONMENTAL IMPACTS OF THE PROJECT THEIR MITIGATION MEASURES: 13
PROPOSED ENVIRONMENTAL MONITORING 14
CHAPTER # 1 15
INTRODUCTION 15
PURPOSE OF THE REPORT 15
IDENTIFICATION OF THE PROJECT AND PROPONENT 15
PROPONENT: 15
DETAILS OF CONSULTANT 16
BRIEF DESCRIPTION OF NATURE, SIZE AND LOCATION OF PROJECT 16
LOCATION 17
SCREENING 19
SCOPING 19
SPATIAL AND TEMPORAL BOUNDARIES OF THE PROJECT 19
IMPORTANT ISSUES AND CONCERNS RAISED DURING THE PROJECT 19
SIGNIFICANT IMPACTS TO BE DETERMINED 19
CHAPTER # 2 20
ALTERNATIVE CONSIDERATIONS 20
SITE ALTERNATIVES: 20
REJECTED SITE A (NEAR TO CHUNG) 20
SELECTED SITE 21
TECHNOLOGY ALTERNATIVES: 21
ENVIRONMENTAL ALTERNATIVE 21
ECONOMIC ALTERNATIVES 22
CHAPTER # 3 23
DESCRIPTION OF THE PROJECT 23
OBJECTIVES OF THE PROJECT 23
LOCATION AND SITE LAYOUT OF THE PROJECT: 23
LAND USE ON SITE 25
ROAD ACCESS 25
VEGETATION FEATURES OF THE PROJECT 25
COST AND MAGNITUDE OF THE OPERATION 25
SCHEDULE OF IMPLEMENTATION 25
PROCESS DESCRIPTION 25
GRID STATION 25
AIR INSULATED SUBSTATION (AIS) 26
WATER REQUIREMENTS: 30
WASTE WATER TREATMENT: 30
SOLID WASTE: 30
SOLID WASTE MANAGEMENT SYSTEM/PRACTICES 30
PLANTATION 31
PARKING AREA 31
OCCUPATIONAL HEALTH AND SAFETY: 31

PERSONAL PROTECTIVE EQUIPMENT: 31
SECURITY 32
RESTORATION / REHABILITATION PLAN 32
GOVERNMENT APPROVALS REQUIRED BY THE PROJECT 32
CHAPTER # 4 33
DESCRIPTION OF ENVIRONMENT 33
CHAPTER # 5 47
SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & THEIR MITIGATION MEASURES 47
METHODOLOGIES FOR IMPACT IDENTIFICATION: 47
PROJECT IMPACT EVALUATION MATRIX..... 47
IMPACT ANALYSIS AND PREDICTION: 49
CONSULTATIONS/ CASE STUDIES: 49
MEETINGS:..... 49
ANALYSIS OF IMPACTS AND RECOMMENDED MITIGATIONS 50
ENVIRONMENTAL IMPACTS DUE TO PROJECT LOCATION 50
MITIGATION MEASURES FOR LOCATION PHASE IMPACTS 50
ENVIRONMENTAL IMPACTS DUE TO THE PROJECT DESIGN 51
MITIGATION MEASURES AND RECOMMENDATIONS..... 51
ENVIRONMENTAL IMPACTS DURING THE CONSTRUCTION PHASE 51
MITIGATION MEASURES AND RECOMMENDATIONS..... 53
IMPACT ON PHYSICAL RESOURCES 54
IMPACT ON ENVIRONMENTAL RESOURCES..... 55
IMPACT ON AIR QUALITY 55
MITIGATION MEASURES 55
IMPACT ON NOISE LEVELS..... 55
MITIGATION MEASURES: 55
IMPACT ON SURFACE WATER QUALITY 56
MITIGATION MEASURES: 56
IMPACT ON GROUND WATER QUALITY 56
MITIGATION MEASURES: 56
IMPACT ON SOIL AND GEOLOGY..... 57
MITIGATION MEASURES: 57
IMPACT ON ECOLOGICAL RESOURCES..... 58
MITIGATION MEASURES: 58
IMPACT ON TERRESTRIAL ECOLOGY..... 58
MITIGATION MEASURES: 58
REMOVAL OF TREES 59
MITIGATION MEASURES: 59
EFFECT ON LOCAL ROAD NETWORK 59
IMPACT ON HUMAN ENVIRONMENT 59
HEALTH AND SAFETY..... 59
MITIGATION MEASURES: 60
SOCIO-ECONOMICS 60
CONSTRUCTION WASTE 61
MITIGATION MEASURES: 61
ENVIRONMENTAL IMPACTS DURING OPERATION STAGE 61
RECOMMENDATIONS 62
ELECTRO MAGNETIC FIELDS (EMF)..... 62
ELECTRIC SHOCK 63
MITIGATION MEASURES: 63
NOISE GENERATION 63

OIL SPILLAGE 63
MITIGATION MEASURES: 63
POTENTIAL ENVIRONMENTAL ENHANCEMENT MEASURES 64
PURPOSE OF MITIGATION MEASURES 65
WHAT IS THE PROBLEM I.E. IN TERMS OF "MAJOR ENVIRONMENTAL IMPACTS" WHICH MAY ARISE BY THE SUBJECT PROJECT ACTIVITY? 65
WHEN THE PROBLEM WILL OCCUR AND WHEN IT SHOULD BE ADDRESSED? 65
WHERE AND HOW THE PROBLEM SHOULD BE ADDRESSED? 65
WHYS OF ACHIEVING MITIGATION MEASURES 65
CHANGING IN PLANNING AND DESIGN: 65
IMPROVED MONITORING AND MANAGEMENT PRACTICES: 65
COMPENSATION IN MONEY TERMS: 65
REPLACEMENT, RELOCATION AND REHABILITATION: 65
ENVIRONMENTAL MANAGEMENT PLAN 66
CHAPTER # 6 67
ENVIRONMENTAL MANAGEMENT AND MONITORING PROGRAM 67
PURPOSE AND OBJECTIVES OF THE EMP: 67
MANAGEMENT APPROACH: 67
INSTITUTIONAL CAPACITY ERROR! BOOKMARK NOT DEFINED.
TRAINING SCHEDULES 67
TRAINING OF BUILDING CONTRACTOR 67
RESPONSIBILITY OF EMP 68
SUMMARY OF IMPACTS AND THEIR MITIGATION MEASURES ERROR! BOOKMARK NOT DEFINED.
ENVIRONMENTAL BUDGET 69
CHAPTER # 7 87
STAKEHOLDERS PARTICIPATION 87
OBJECTIVES OF CONSULTATION 87
METHODOLOGY OF CONSULTATION: 87
PROPONENT'S ENVIRONMENT MANAGEMENT TEAM 88
RESPONSIBLE AUTHORITY 88
ENVIRONMENTAL PRACTITIONERS AND EXPERTS 88
OTHER DEPARTMENTS AND AGENCIES 88
AFFECTED & WIDER COMMUNITY 88
SAMPLE SIZE 89
STATISTICAL ANALYSIS 89
FINDINGS OF THE OVERALL DISCUSSION: 91
CHAPTER # 8 93
CONCLUSION AND RECOMMENDATIONS 93
CONCLUSIONS 93
RECOMMENDATIONS 93

EXECUTIVE SUMMARY

Title & Location of the project

Subject project for which this Environmental Impact Assessment (EIA) Study has been conducted for the extension of load from 10MW to 18MW at 132 KVA Diamond Fabrics Grid station located at 26km Faisalabad Road, Sheikhupura. Estimated cost of the project will be Rs.138,192,821/- for grid station and Rs. 21,920,651/- for transmission lines.

This case is being submitted under the directions of the letter issued by PMU LESCO letter vide no. 500-505/Dev./E&S/DW/05 to ensure the compliance of environmental obligations in construction of 132 kV Diamond Fabrics Grid Station attached as **Annexure–A.** Grid stations will transform voltage from high to low through Air insulated substation to provide continuous power to the industrial unit.

Main equipment will include wavetrap, switch gear, isolator, Lighting arrestor, circuit breakers, insulators, protective relays, switchyards, interconnecting transmission lines, autotransformers, switching stations, and step-down transformers.

The proposed project falls under Schedule II A (3) of Review of IEE and EIA Regulations, 2000. 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 Diamond Fabrics Limited located at 26km Faisalabad road, Sheikhupura.

Project land coordinates are as follows:

North: Main Road

South: Industrial Unit

East: Open plot.

West: Open plot.

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


Diamond Fabrics Grid Station
Legend
Diamond Fabrics Limited
Bank Al Habib
Sapphire Diamond Spinning
Diamond Fabrics Limited
Diamond Fabrics Limited
Diamond Fabrics Limited (Guest Hous
Google Earth
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Name of the proponent

Name: Mr. Amer Abdullah

Designation: Proponent

Mailing Address: Diamond Fabrics Limited, 26 km Faisalabad Road, Sheikhupura

For further details CNIC of the proponent and other relevant documents are attached as **Annexure-D** 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:	Installation of 132 KV AIS Grid Station
Location of the project:	Diamond Fabrics Limited 26 km Faisalabad Road, Sheikhupura
Proposed Area:	Total area proposed for the subject project is 5 kanals
Nature of Project:	Nature of the project is proposed. At the time of visit, project site was an open plot and no constructional activities had been started at the project site.
Capacity of project:	18MW 132 kV
Cost of the project:	Total cost of the project will be approx. Rs.138,192,821/- for grid station and Rs. 21,920,651/- for transmission lines.
Project process:	Grid stations will transform voltage from high to low through Air insulated substation to provide continuous power to the consumers.
Detail of Equipment (132KV AIS Grid Station)	Main equipment will include wave trap, switch gear, isolator, Lighting arrestor, circuit breakers, insulators, protective relays, switchyards, interconnecting transmission lines, autotransformers, switching stations, and step-down transformers.
Labor/ Workforce:	During construction: 10-15 (estimated) During Operation: 15-20(estimated)
Water Requirement:	During the constructional phase of the project approximately 1500-gallon water will be required per day for constructional and domestic uses. During the operational phase of the project approx. 1400 Liters/day water will be required for domestic purposes.
Solid waste:	Approx. 600-800 kg/day constructional and domestic waste will be produced during the constructional phase of the project. During operation: 9-10 kg/day domestic. At the time of maintenance project waste will be generated, which will be handed over to contractors.

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.

Recommended mitigation measures

Major impacts recommended mitigation measures along with their proposed monitoring schedule.

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

Aspect	Impact	Mitigation	Monitoring parameters	Location	Monitoring	Frequency monitoring	Responsibility
Construction phase							
Air	Health affects, Reduced visibility on roads	Sprinkling of water, Tuning of construction vehicles & machines, Dust masks for laborers	Particulate Matter Smoke CO, Sox	All project locations	Vehicular emissions Dust Ambient air quality	Monthly for emissions and daily for dust	HSE Manager/ Proponent
Noise	Stress Hypertension Hearing loss Headache	Avoid working at night Lubrication of construction vehicles Provision of Ear plugs	Noise levels	Project location close to residential areas	Noise monitoring device		HSE Manager/ Proponent
Land & Soil	Erosion due to excavation Formation of pits due to improper backfilling	Proper backfilling and stone pitching around the excavated site if required	Surface topography	All project locations	Visual assessment Photographic evidences	From beginning till completion of project	HSE Manager/ Proponent
Vegetation	Cutting of trees	Avoid unnecessary cutting of trees In case of cutting of trees, one plant should be replaced by 6 plants	No of trees cleared or cut Disposal of chopped trees Ensure replantation by 1:6	All project locations	Visual assessment Photographic evidences	From beginning till operational phase	HSE Manager/ Proponent

			ratio of same species				
Water	Wastage and misuse of water	Avoid un necessary use of water Prevent leakages	Water supply and use	All project locations	All project locations	From beginning till the end of project	HSE Manager/ Proponent
Construction debris	Formation of heaps Remaining concrete material results in hardening of ground surface	Avoid wastage of concrete material Reuse remaining construction material	Quantity & quality of construction material	All trenching areas	Visual assessment Photographic evidence	Weekly	HSE Manager/ Proponent
Social Environment	Disturbance to routine market and local business activities Conflicts between laborers and local communities	Specify time scale for construction activities Discussion with local people regarding conflicts if any	Maintenance of complaint register	All project locations	Review of complaint register Local consultations	Monthly	HSE Manager/ Proponent
Roads and networks	Traffic congestion Night time visibility of drivers is reduced	Diversion routes must be allocated to maintain traffic flow Signs and reflectors must be boarded for driver's visibility	Signs and detours are being followed	Intersections of diversions	Observations Local residents consultations and log book	Weekly	HSE Manager/ Proponent

Health and safety	Lack of awareness to general public about safety may lead to accidents Incompetent and untrained workers might cause harm to themselves and others. Construction works may include many risks and hazards that may lead to injuries or even death	Safety symbols and instructions will be boarded at work sites Trained personnel will be appointed for the specific work Appropriate PPEs must be used for technical work	Safety precautions Use of PPEs	On all project sites	Tool box talk Visual assessments Record of PPEs	Daily	HSE Manager/ Proponent
Operational Phase							
Electric Magnetic Field (EMF)	Human health impacts such as, neuropsychological disorders or cardiovascular diseases	Increase depth of cables to suppress the EMF levels Appropriate cabling with protective shields to suppress electron flux	EMF Intensity	Residency units near the corridor and grids	Electromagnetic meter	Biannually	HSE Manager/ Proponent

Transformer oil spillage	Contamination of soil and water bodies	Regular checking of storage tanks and machines	Soil sampling for oil and grease	Grid station	Visual assessment Soil analysis Equipment maintenance record	Bi annually	HSE Manager/ Proponent

Table: Summary of Environmental impacts of the project their mitigation measures:

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 quarterly 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 quarterly 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 sectorial 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

Subject project for which this Environmental Impact Assessment (EIA) Study has been conducted for the extension of load from 10MW to 18MW at 132 KVA Diamond Fabrics Grid station located at 26km Faisalabad Road, Sheikhupura

Proponent:

Name: Mr. Amer Abdullah

Designation: Proponent

Mailing Address: Diamond Fabrics Limited, 26 km Faisalabad Road, Sheikhupura

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

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	Twelve Years' Experience as Environmentalist
2	Senior Environment professional	Mian Iftikhar Ahmad Mphil Environmental Science	Eight Years' Experience
3	Associate Environmental professional	Faiza Anjum M.S Environmental science	3 years' Experience

Brief description of Nature, Size and Location of Project

Subject project for which this Environmental Impact Assessment (EIA) Study has been conducted is the proposed installation of 132 KV AIS (Air Insulated Substation) Grid station for the extension of load from 10 MW to 18 MW at Diamond Fabrics

Limited at Diamond Fabrics Limited located at 26-km Faisalabad road, Sheikhupura for the seamless distribution of electricity to the industrial unit. The grid station is being installed at an area of 5 kanals within the boundary of industrial unit.

This case is being submitted under the directions of the letter issued by PMU LESCO letter vide no. 500-505/Dev./E&S/DW/05 to ensure the compliance of environmental obligations in construction of 132 kV Diamond Fabrics Grid Station attached as **Annexure–A**

Location

Subject proposed project is located at Diamond Fabrics Limited 26-km Faisalabad road, Sheikhupura

Project land coordinates are as follows:

North: Main Road

South: Industrial Unit

East: Open plot.

West: Open plot.

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


Diamond Fabrics Grid Station
Legend
Diamond Fabrics Limited
Bank Al Habib
Sapphire Diamond Spinning
Diamond Fabrics Limited
Diamond Fabrics Limited
Diamond Fabrics Limited (Guest Hous
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Screening

The proposed project falls under Schedule II A (3) of Review of IEE and EIA Regulations, 2000.

Scoping

Scoping is the preliminary stage of Environmental impact assessment where initial visits of the project site is done to assess the spatial and temporal boundaries of the project, to asses significant impacts and consult the local community about their issues regarding the project.

Spatial and temporal boundaries of the project

The project lies at the industrial area of Sheikhupura having several industrial units around its vicinity. The subject project is the extension of load from 10MW to 18MW at the Diamond Fabrics Industrial Unit. The project has an area of 5 kanals. The detailed spatial and temporal boundaries of the project is shown in the map attached as annexure C

Important issues and concerns raised during the project

Important issue and concerns raised by the community during consultation include the contamination of soil and water bodies through oil spillage. The proponent also ensured the regular checking of storage tanks will be done to avoid spillage. The community was also concerned about employment to local people. The proponent made sure that maximum job opportunities will be provided to the residents.

Significant impacts to be determined

There can be impacts related to contamination of soil and water bodies through oil spillage. The proponent also ensured the regular checking of storage tanks will be done to avoid spillage.

CHAPTER # 2
ALTERNATIVE CONSIDERATIONS

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.

Rejected Site A (Near to Chung)

Project proponent first considered the site near to Chung for the subject proposed project. This site was open but near the site human settlement is present.

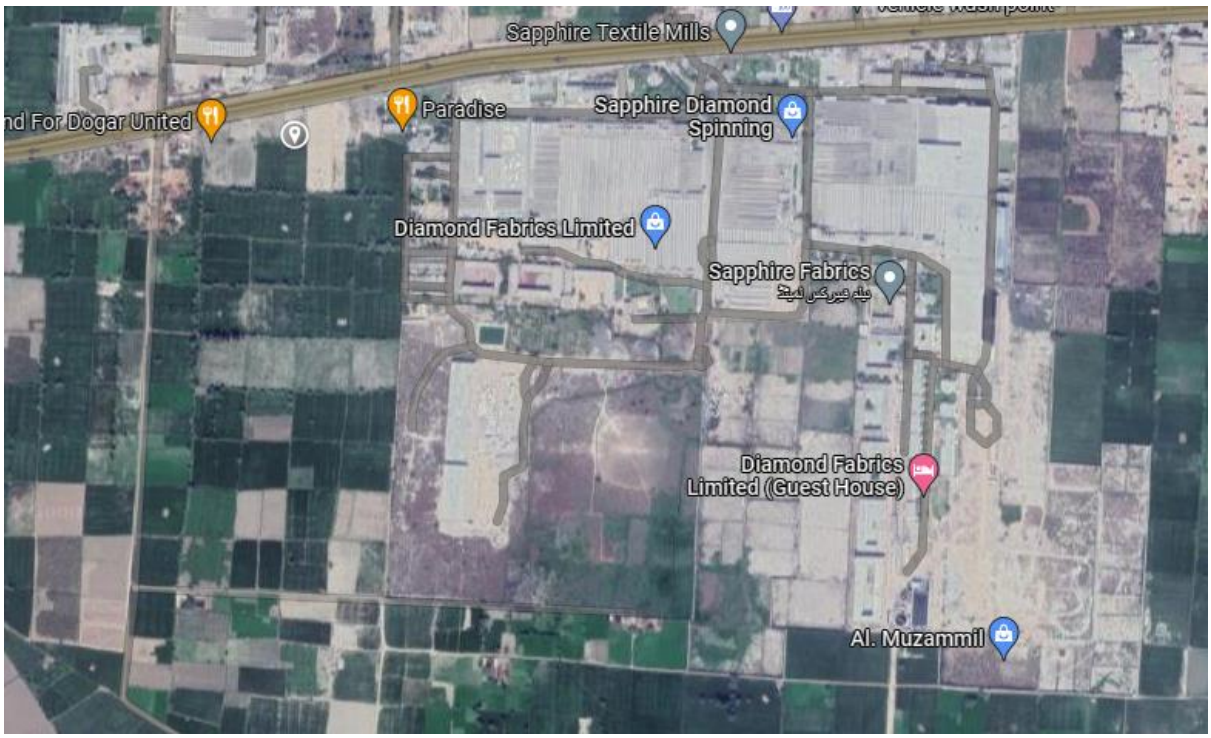


Figure 0-1 rejected site A

Rejection Reason:

The above site was rejected for the proposed project on the following grounds:

- Longer distance from Industrial Unit

- Higher cost of machinery installation and linkage with housing scheme
- Conflict with neighbors

Selected site Subject project site for the establishment of Grid Station is located within the boundary of Diamond Fabrics Limited, Sheikhupura.

Reason of selecting existing site:

- No land disputes, Project site is within the industrial unit area
- Easy access of road
- Economically Feasible
- No vegetation clearance



Technology Alternatives:

The proposed development will be constructed using modern, locally and internationally accepted technology and materials to achieve public health, safety, security and environmental aesthetic requirements. Equipment that saves energy will be given first priority without compromising on cost or availability factors.

M/s Diamond Fabrics is an Environmental conscious company which intends to use modern and state of art machinery with minimum impacts on Environment.

Environmental alternative

Construction of this projecrin this area will have minimal impact on the daily life people living in housing scheme. The project proponent is recommended to make sure that there is no oil spillage or any environmental impact is caused during the project operations. The Proponent will make sure all the operations will be according to EMP recommendations.

Economic Alternatives

This grid station will distribute electricity to the industrial unit meeting the demand of power for the operations of the industrial unit. Installation of grid station will provide continuous supply of electricity to the unit. It will be a source of job opportunities to local population.

CHAPTER # 3

DESCRIPTION OF THE PROJECT

Electric power transmission is the bulk transfer of electrical energy between the point of generation and multiple substations near a populated area or load center. Electric power transmission allows distant energy sources to be connected to consumers in population centers. Transmission may be via overhead or underground lines, however, most transmission is done with overhead lines because they are less costly to construct and easier to maintain. Underground lines are generally restricted to urban areas.

A power transmission network is referred to as a “grid.” Multiple redundant lines between points on the grid are provided so that there are a variety of routes from any power plant to any load center. The specific routing of electricity on the grid at any time is based on the economics of the transmission path and the cost of power.

Objectives of the Project

Objectives of the construction of the subject project are:

- Assess the existing environmental conditions in the project area, including the identification of environmentally sensitive areas and receptors;
- Assess the various activities (such as construction, process, operational etc) to identify their potential impacts on environment, evaluate these impacts, and determine their significance;
- Propose appropriate mitigation measures that can be incorporated into the design of the proposed activities to minimize damaging effects or lasting negative consequences identified by the environmental assessment;
- Assess the proposed activities and determine whether they comply with the relevant environmental regulations in Pakistan;
- Prepare an EIA report for submittal to the Environmental Protection Agency (EPA), Punjab.

Location and site layout of the project:

Subject proposed project is located at Diamond Fabrics Limited 26 km, Faisalabad road, Sheikhupura.

Project land coordinates are as follows:

North: Open Land

South: Industrial Unit

East: Open plot.

West: Industrial Unit



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

Land Use on site

Site proposed for the installation of the subject project is the property of the Diamond Fabrics. Nature of area is industrial

Road Access

Link road at the front side of the project area is present which connects to the main Road i.e Sheikhupura Faisalabad road.

Vegetation Features of the Project

Land proposed for the subject project is clear and free of dense vegetation.

Cost and magnitude of the operation

Subject project is the proposed installation of 132 KV AIS Grid station. Total area proposed for the installation of the subject project is 5 kanal. Total cost of the project will be approx. Rs.138,192,821/- for grid station and Rs. 21,920,651/- for transmission lines. There are no other associated activities with regard to the subject project.

Schedule of Implementation

Detailed feasibility studies and designing of the project have been completed. Necessary legal, administrative and financial formalities are being finalized. The project is expected to be completed within 06-07 months from the date of environmental approval. Subsequently the operational and maintenance aspects of the project will be undertaken by the proponent.

Process Description

Grid station

A Grid station (substation) is part of an electrical generation, transmission, and distribution system. Grid stations transform voltage from high to low, or the reverse, or perform as a buffer to provide continuous power to the consumers even if there is a shortfall of power from the source. Electric power may flow through several grid stations between generating plant and consumer, and its voltage may change in several steps. A substation may include transformers to change voltage levels between high transmission voltages and lower distribution voltages, or at the interconnection of two different transmission voltages.

Grid stations depend upon its switchgear which can be of two types Gas Insulated or Air Insulated. For this project Air Insulated Substation is proposed to be installed.

Air Insulated Substation (AIS)

Air Insulated Substation (AIS) It is also called conventional substation/ grid station. There are two types of AIS, Indoor and Outdoor. In indoor type of AIS, all the bays are installed inside a building while in outdoor type all the bays are installed in open air. The indoor type substation is more reliable than outdoor type where equipment is safe and faults are less as compare to outdoor type. The type to be installed for this project will be finalized after award of contract.



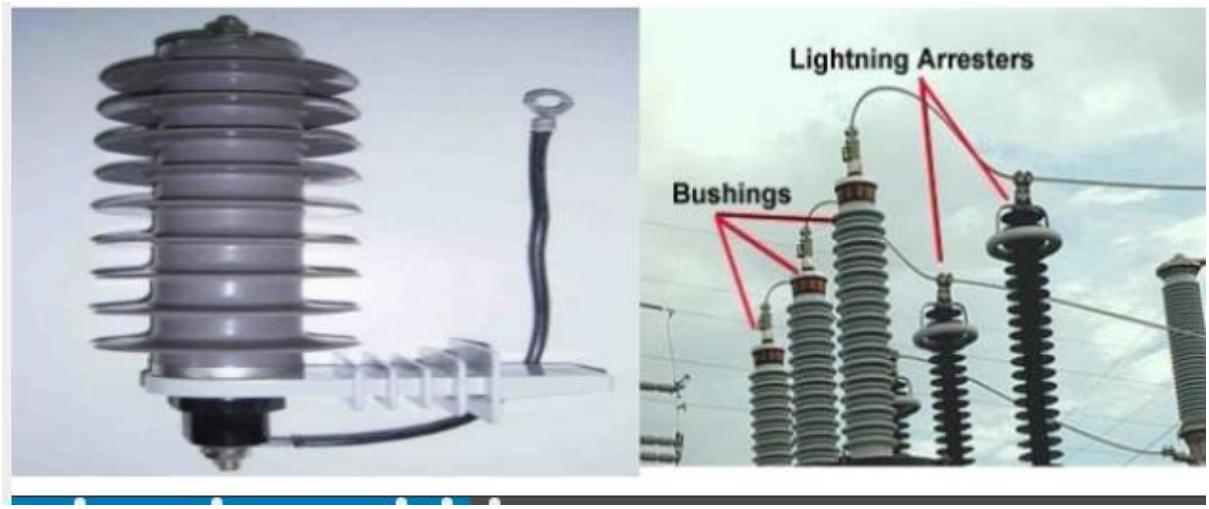
Following are the key factors for AIS:

1- More area required to install separate large components
2- Ease-of-Access for Maintenance as components are individually set up
3- Voltage limitations upto 132 kV
4- Economically more feasible

Following details of AIS is as follow;

Lightening Arrester:

This equipment connected on power poles and towers of the substation. The device which is used for the protection of the equipment at the substations against travelling waves, such type of device is called lightning arrester or surge diverter. In other words, lightning arrester diverts the abnormal high voltage to the ground without affecting the continuity of supply.



Wave Trapper:

It traps the signal and send it to PLCC control Room. Wave trap is used to create high impedance to the carrier wave high frequency communication entering in to unwanted destinations typically substation. Wavetraps are also called as line traps. It consists of an inductor coil which is connected in series with the high voltage power system.



Bus Bars:

A Busbar is a metallic strip or bar (typically copper, brass or aluminium) that conducts electricity within a switchboard, distribution board, substation, battery bank, or other electrical apparatus. Its main purpose is to conduct a substantial current of electricity, and not to function as a structural member.



Switch Gear:

In an electric power system, switchgear is the composed of electrical disconnect switches, fuses or circuit breakers used to control fan, protect and isolate electrical equipment. Switchgear is used both to de-energize equipment to allow work to be done and to clear faults downstream.



Circuit Breaker:

A circuit breaker is an automatically operated electrical switch designed to protect an electrical circuit from damage caused by excess current from an overload or short circuit. Its basic function is to interrupt current flow after a fault is detected. Air circuit breakers are used in AIS grid station.

Power Transformer:

It reduces the high voltage in fixed low voltage of 132 KV.



Benefits of Grid station:

- Air used as dielectric
- All the equipment like Circuit breaker, switch gear and others are outdoor.
- Equipment are mounted on lattice and pipe structure and connected with rigid tubes or flexible conductor.
- Easy to expand
- Easily maintain
-

Bird Deterrent/Repellent from Grid Station:

Visual Scares and predator decoys, scare balloons, flash tape will be used as bird deterrent to avoid their collision with transmission lines. Pictorial view of all these deterrents is as follow:



Figure 2 Visual scares & predator decoys



Figure 3 Bird Spikes


Reflect-a-Bird™ Bird Deterrent


Bird-B-Gone Scare Balloon


Bird-B-Gone Flash Tape 1" x 50' (3pk)

Water requirements:

During the constructional phase of the project approximately 1500 gallon/ day water will be required per day for constructional and domestic uses.

During the operational phase of the project approx. 2000 gallons /day water will be required for domestic purposes (based on the standard for average use of water 80 gallons of water per person per day).

Waste water treatment:

60-70% of the used water will be the waste water which will be treated in the septic tanks.

Solid waste:

Approx. 600-800 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. 9-10 kg/day domestic (based on solid waste generation rates of 0.45 kg/capita/day urban waste generation) which will be handed over to the certified contractors. Project related waste will not be generated as the subject project is Grid station.

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 designated points.
2. Collection of waste from all the offices at one designated point by the sanitary workers on daily basis.

3. Careful collection of 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.

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:

During Constructional activity, all the methods and procedures for machinery and chemical handling and storage will be displayed and implemented at the project site.

Personal Protective Equipment:

Following PPEs will be available for the workers in the installation of proposed grid station

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

Table: Types of PPEs used during Installation 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

Security

The present 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.

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 approvals required by the project

All approvals will be submitted after getting environmental approval from EPA Punjab.

CHAPTER # 4
DESCRIPTION OF ENVIRONMENT

This chapter gives an overview of the environmental baseline information of project area. 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 collected 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

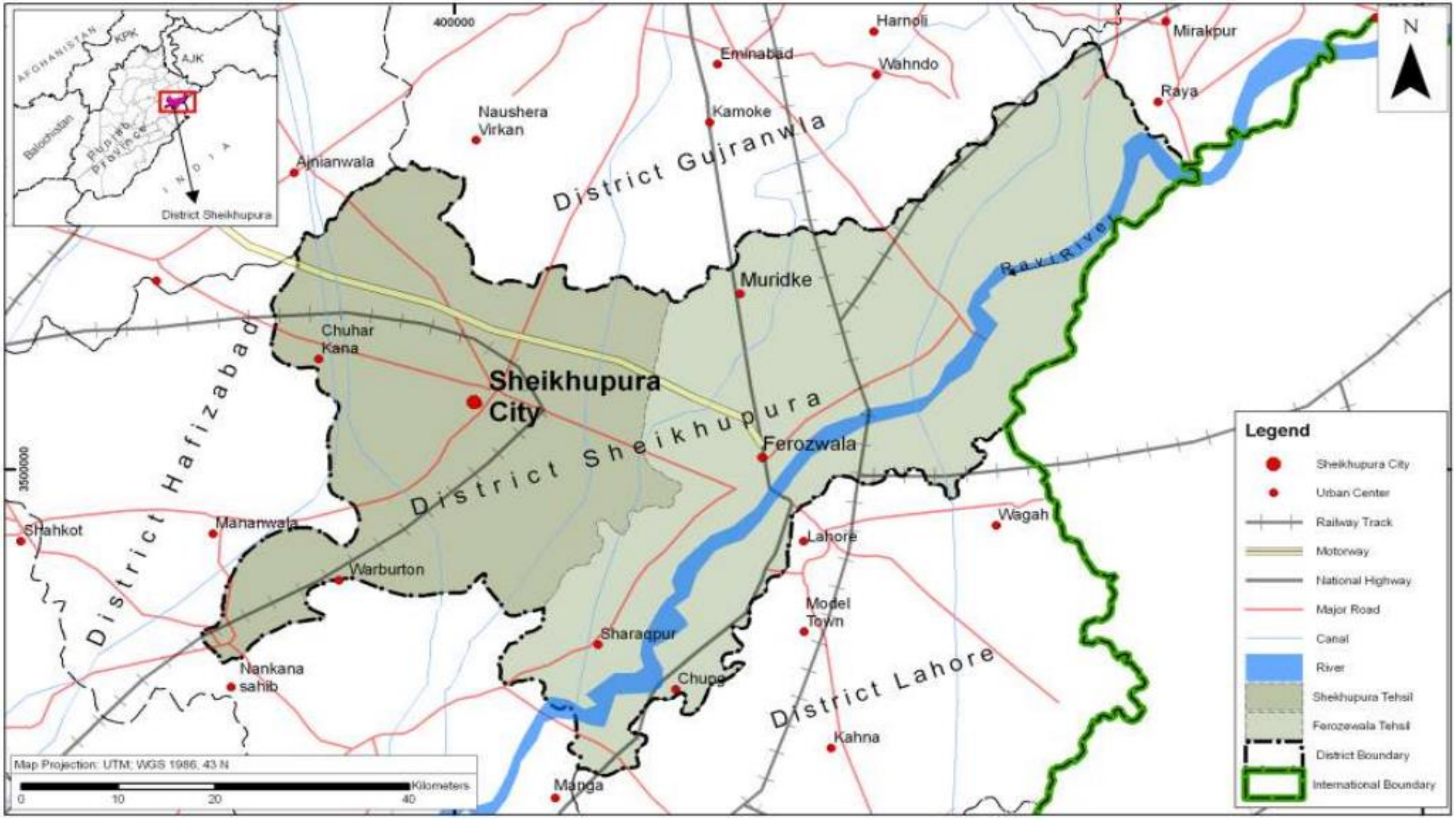
Site Location:

The subject area lies within the administrative boundaries of District Sheikhupura. The subject project site is located at 26 km Faisalabad road, Shiekhupura.

Brief Description of the District:

Sheikhupura, is a district located in Lahore Division of Punjab province, Pakistan. Sheikhupura is the headquarters of Sheikhupura district. District Sheikhupura is surrounded by 6 districts, bounded on the North by Gujranwala and Hafizabad districts, on the North-East by Narowal district, on the West by Hafizabad district, on the South-West by Nankana Sahib district, on the East by Lahore district. District Sheikhupura is spread over an area of 3,280 square kilometres comprising of following tehsils:

- Sheikhupura
- Ferozewala
- Muridke
- Sharaqpur
- Safdar Abad



Ref: *Sheikhupura city profile/ Punjab cities improvement investment program/ the urban unit, P & D department, Punjab*

Climatic Conditions:

Sheikhupura has a hot semi-arid climate (Köppen climate classification ***BSh***).

The climate of the district is subject to extreme variations. From the middle of December to the middle of March, the air is very damp, cold and light to moderate rain falls at intervals. The winter rain is followed by a spell of pleasant weather. In April, the temperature rises fast and the two successive months are very hot. Towards the end of June, Monsoon appears. The average rainfall in the district is about 635 mm. The upland or the Bar in the North West, in the natural condition, is a level prairie thickly dotted over with a stunted under-growth of bush jungle. The Bar Soil is popularly known as Missie. The low land along the river Ravi has light loam. The central portion which is the Deg Valley has stiff soil. Stiff soil is either Rohi or Kallarathi depending on the salt (kallar) contents.

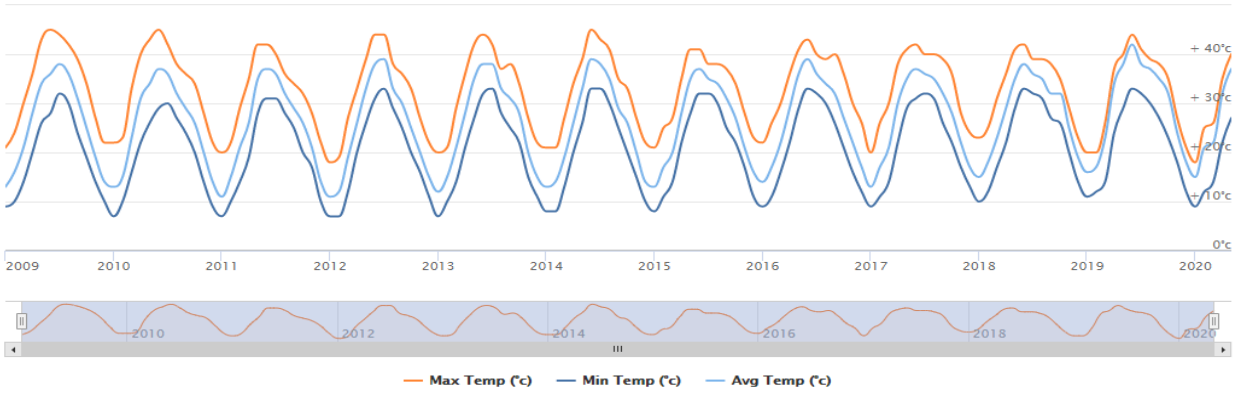
Ref: https://sheikhupura.punjab.gov.pk/climate

The summer season starts from April and continues till October. During the summer season, temperature ranges from 30 to 45 degrees Celsius. The winter season starts from November and continues till March. December and January are the coldest months with a mean minimum temperature of 5 degrees. The dust storms occur occasionally during the hot season, during June, July and August. Rainy weather alternates with oppressive weather. The rainfall is 635 mm per year. The mean minimum and maximum humidity during winter is 37% and 84%.

Ref: http://sheikhupura.dc.lhc.gov.pk/PublicPages/HistoryOfDistrict.aspx

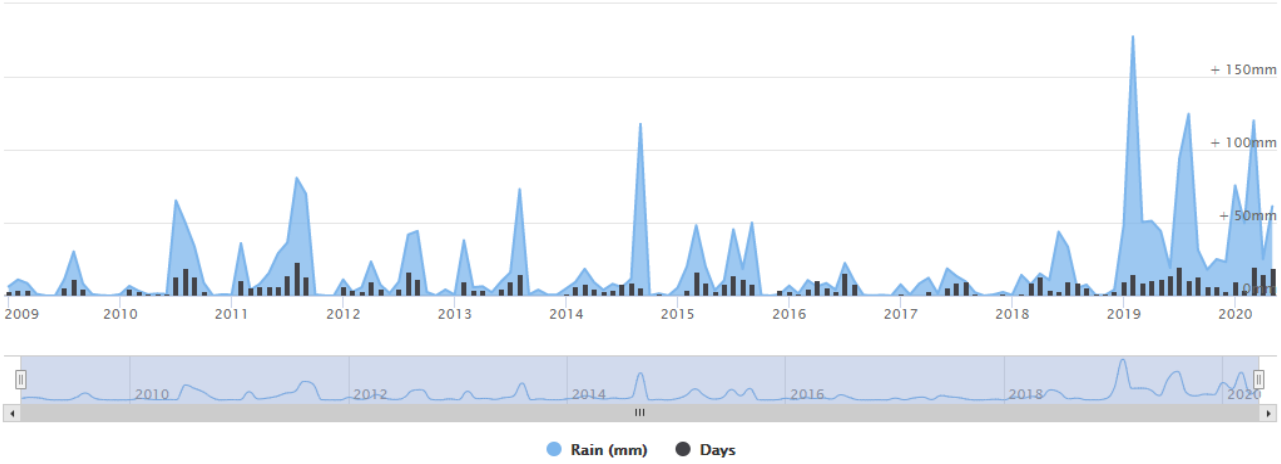
Graphical representation:

Temperature:



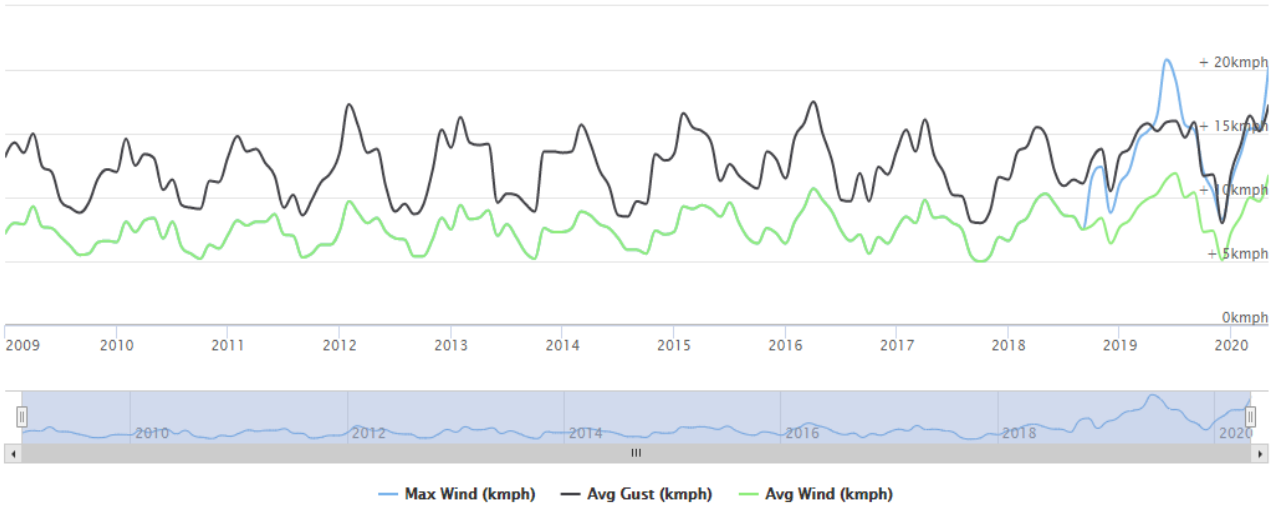
(www.worldweatheronline.com/ Sheikhupura, Pakistan)

Rainfall Days & Rain (mm):



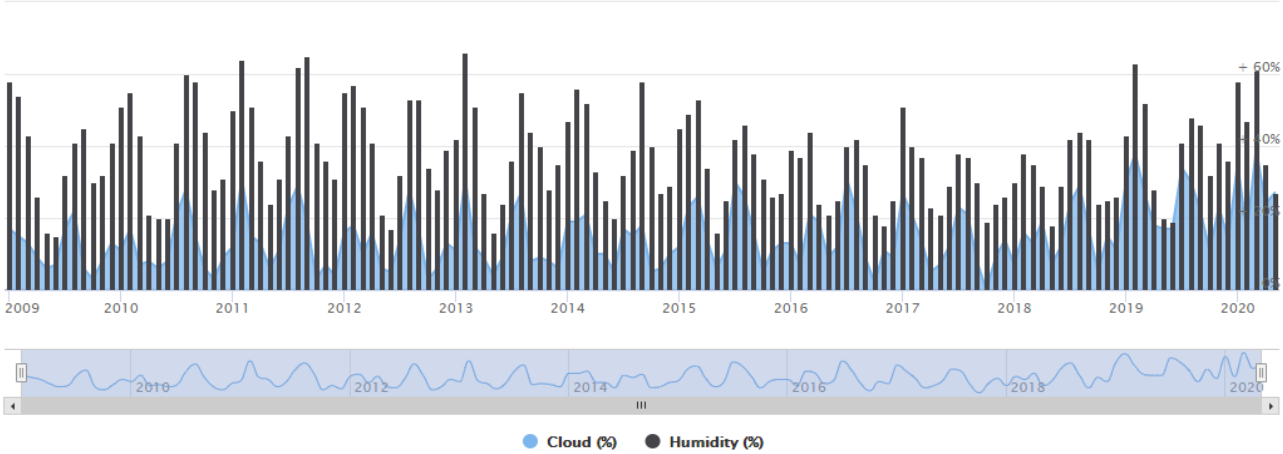
(www.worldweatheronline.com/Sheikhupura/Pakistan)

Wind Speed:



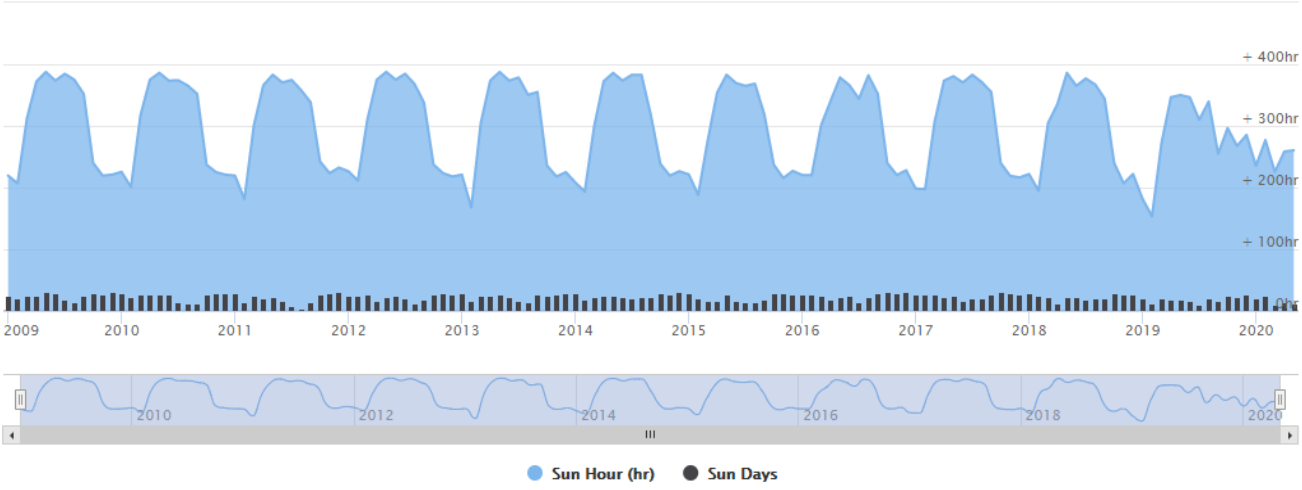
(www.worldweatheronline.com/Sheikhupura/Pakistan)

Humidity:



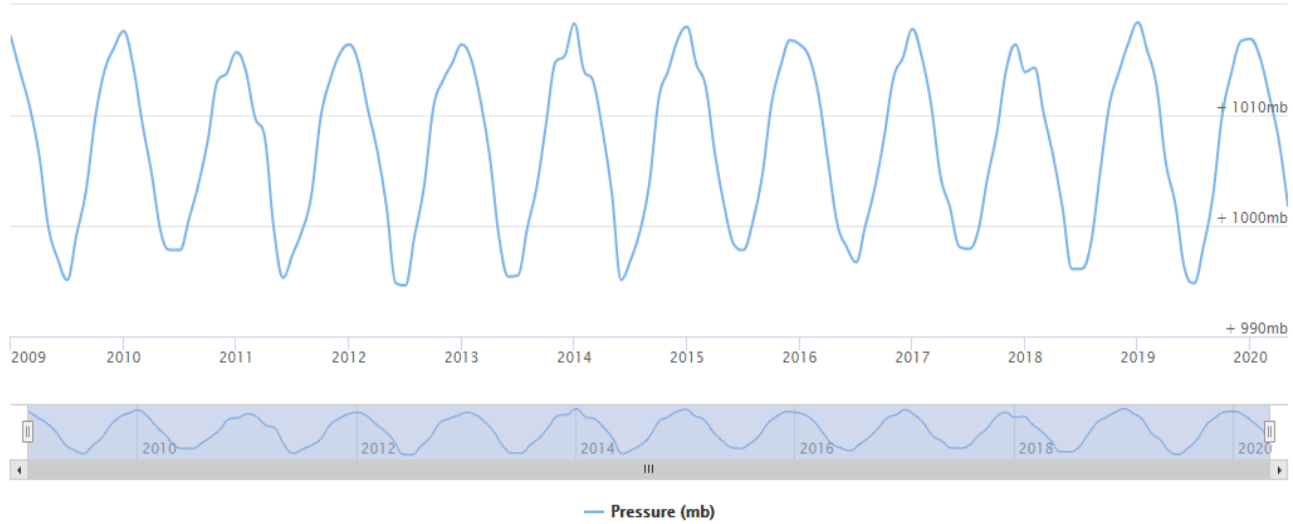
(www.worldweatheronline.com/Sheikhupura/Pakistan)

Sun Hours & Days:



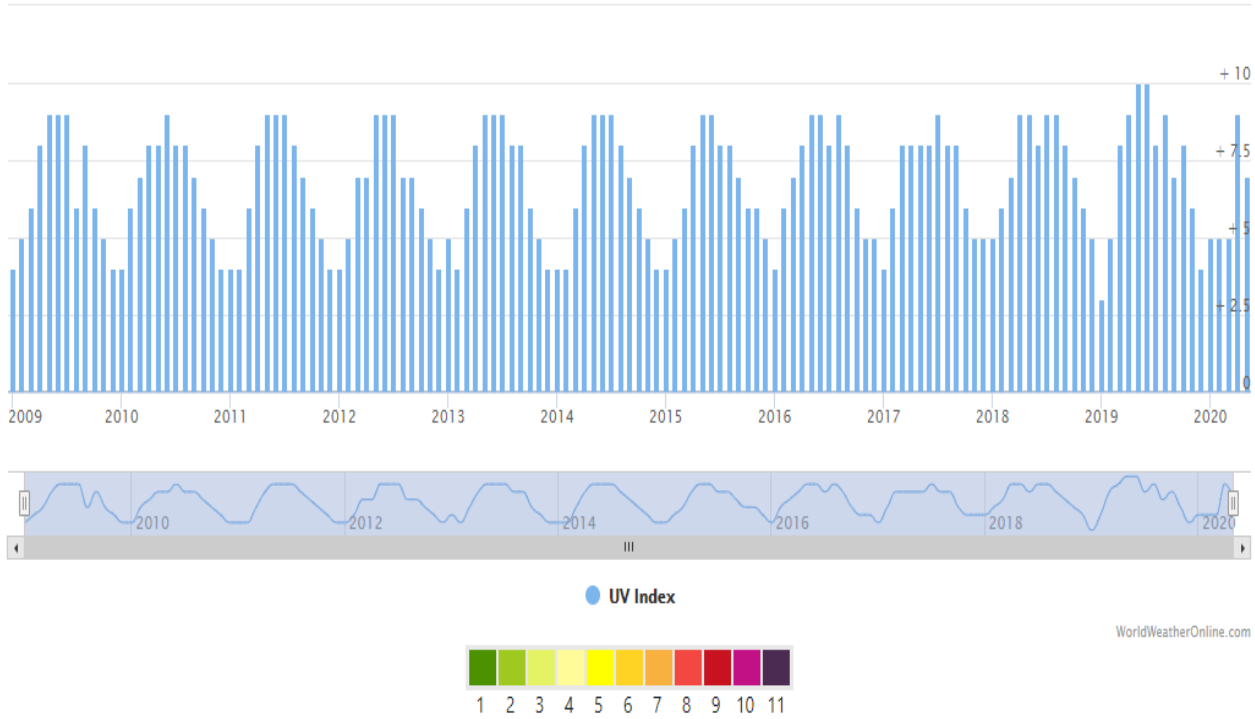
(www.worldweatheronline.com/Sheikhupura/Pakistan)

Pressure:



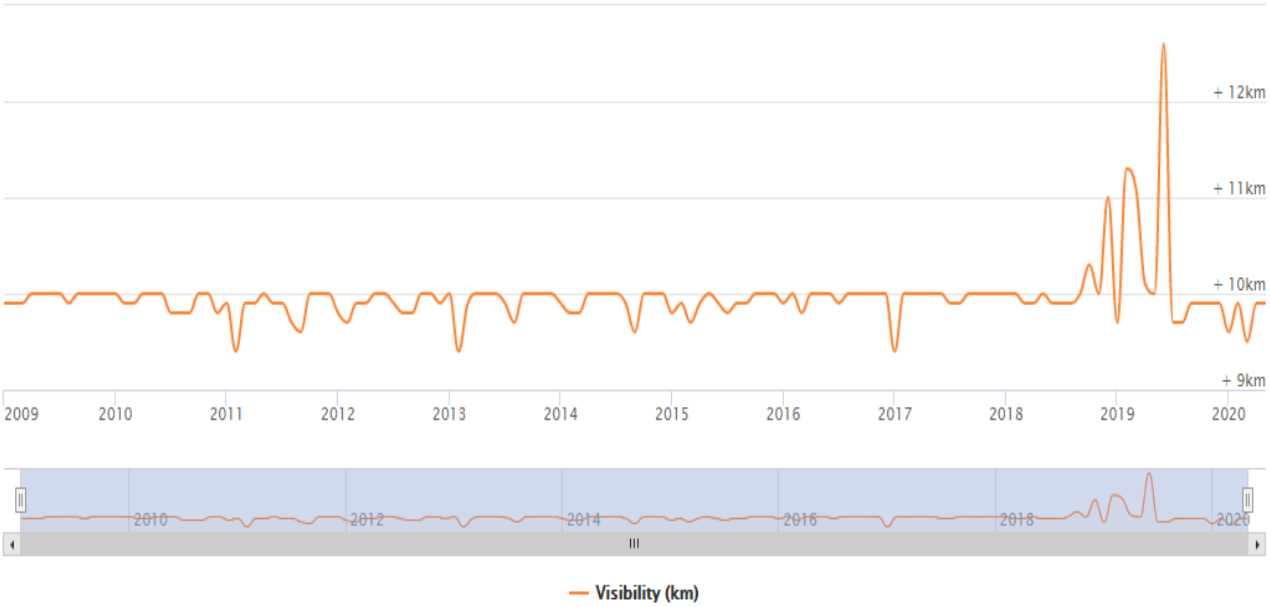
(www.worldweatheronline.com/Sheikhupura/Pakistan)

UV Index:



(www.worldweatheronline.com/Sheikhupura/Pakistan

Visibility (km):



(www.worldweatheronline.com/Sheikhupura/Pakistan)

Air Quality:

Atmospheric pollution has a strong impact on daily life. Project site is located at 26km Faisalabad, sheikhupura.; 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 to established the Baseline data lab results are annexed as **Annexure-E.**

Ground water:

The underground water will be used as a source of water at the project site. The underground water is present at the depth of 90-150 in the area.

Geology:

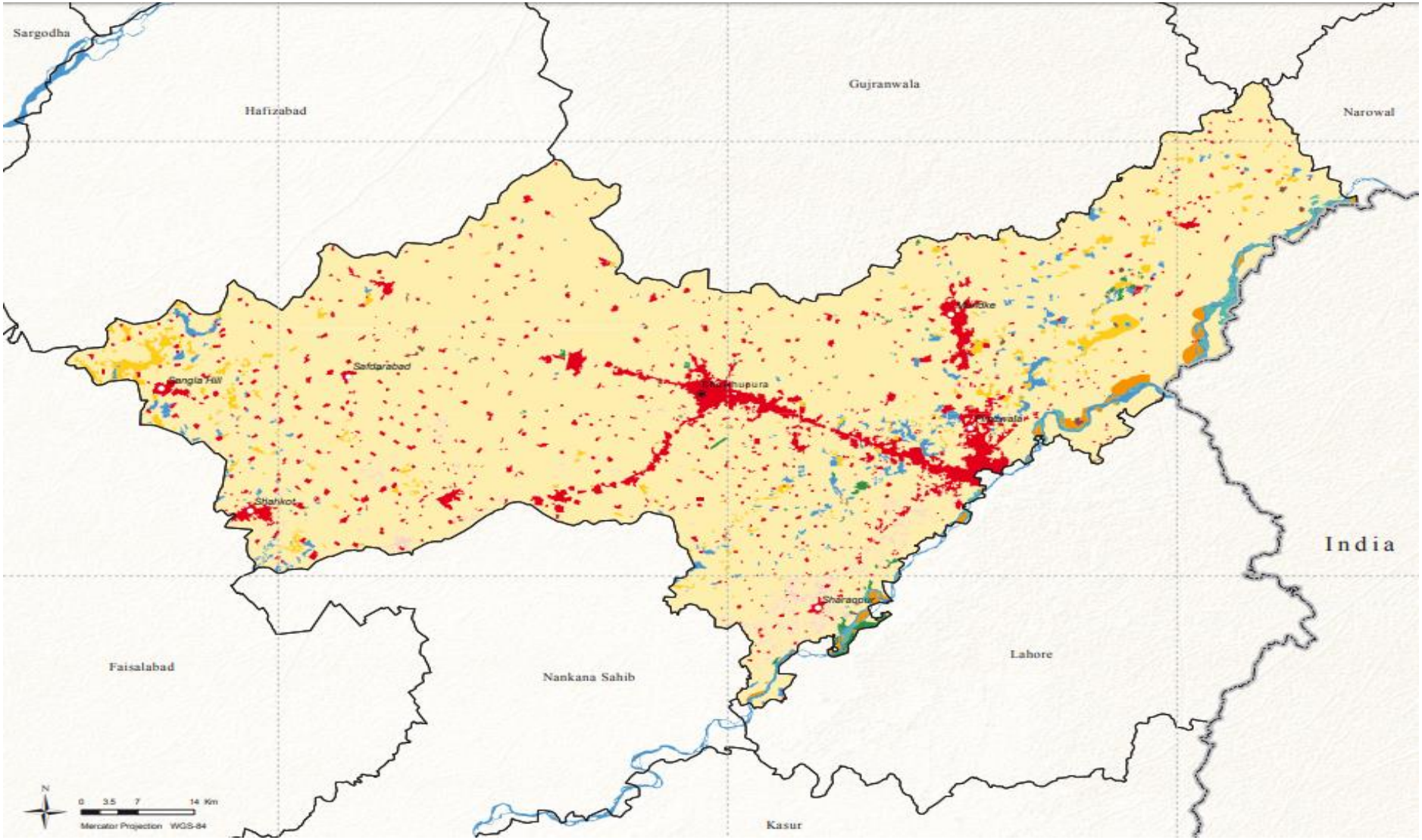
The district of Sheikhupura is located over three main terraces of River Ravi, which make three successive periods of uplift. The terraces have been designated as Narang terrace, Muridkey terrace and Sheikhupura terrace. The areas of Sheikhupura District is comprised of fluvial deposits of River Ravi. The deposits are composed of flood plain muds, mixed with silt, clay and fine sand deposits and fine to medium sands point bars. Remnant of eolian deposits are rare.

Land use:

Sheikhupura district's major crops are sugarcane, wheat, rice and guava. A variety of vegetables are also grown in the district. The district comprises of five tehsils Sheikhupura, Firozwala, Muridke, Sharaqpur and Safdarabad. The district headquarter is at Seikhupura.

Water Resources:

River Ravi runs along with eastern administrative boundary of district from north-east toward south-west.



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

Ecological Resources:

Flora:

No.	PLANT SPECIES	COMMON NAME
1	*Suaeda fruticose*	shrubby seablight
2	*Kochia indica*	Kochia
3	*Diplachnae fusca*	Bearded sprangletop
4	*Desmostachya bipinnata*	halfa grass, big cordgrass, and salt reed-grass
5	*Alhagi maurorum*	*camelthorn*, *camelthorn*-bush
6	*Sporobolus arabicus*	Arabian Drop-Seed Grass
8	*Polypogon monspeliensis*	annual beard-grass or annual rabbits foot grass
9	*Vetiveria zizanioides*	Vetiver
10	*Imperata cylindrical*	Cogongrass
11	*Scirpus maritimus*	Seaside Bulrush. Cosmopolitan Bulrush
12	*Typha angustata*	lesser bulrush, narrow leaf cattail
13	*Acacia Arabica*	babul, kikar
14	*Cassia fistula*	Amaltas
15	*Bombox ceiba*	Simbal
16	*Acacia nilotica*	Desi Kikar
17	*Albizia lebbeck*	Shrin
18	*Azadirachta indica*	Dhrek
19	*Zizyphus numularia*	Jungali Beri
20	*Vernonia cinerascens*	Simbla
21	*Sesbania bispinosa*	Danchi
22	*Ricinus communis*	Harnoli
23	*Justicia adhatoda Linn.*	Baikar
24	*Ipomea carnea*	Chota Aak
25	*Dodonaea viscosa*	Aliar
26	*Datura alba*	Dhatura
27	*Cymbopogon Citratus*	Lemon ghaas
28	*Cannabis sativa*	Bhang
29	*Calotropis procera*	Ak
30	*Abutilon indicum*	Peeli booti
31	*Achyranthes aspera*	Puth kanda
32	*Aleo vera*	Kawar gandal
33	*Althea rosea*	Gul-e-khaira
34	*Anagallis arvensis*	Billi buti
35	*Argemone Mexicana*	Satyanashi
36	*Carthamus Oxycantha*	Poli
37	*Convolvulus arvensis*	Lily
38	*Cucumis melo var.agrestis*	Chiber
39	*Euphorbia helioscopia*	Chatri dhodhak
40	*Euphorbia hirta*	Dhudi kalan
41	*Euphorbia prostrate*	Dhudi khurd
42	*Malva sylvestris*	Pick-cheese
43	*Mentha longifolia*	Jungali pudeena
44	*Ocimum basilicum*	Niazbo
45	*Oxalis corniculate*	Khatti booti
46	*Solanum nigrum*	Makoo

47	*Taraxacum officinale*	Dandelian
48	*Mimosa pudica*	Lajwanti
49	*Sonchus asper*	Sgandi
50	*Withania somnifera*	Asgand

Fauna:

Animal Species:

Domestic cat, squirrel and Jungle cat are faunal species common in this region, other fauna including different types of butterfly, house mouse, crow, and parrot. The area also possesses few frogs spp.

Project site is free from any protected species.

No.	ANIMAL SPECIES	COMMON NAME
1	*Canis aureus*	Geedhar
2	*Canis lupus*	Kutta, Dog
3	*Funambulus pennantii*	Palm squirrel
4	*Rattus Rattus*	Roof rat
5	*Herpestes mungo*	Indian mongoose
6	*Golunda elliota*	Bush rat
7	*Mus musculus*	House mouse
8	*Felis chaus*	Jungle cat
9	*Felis catus*	Domestic cat

Socio-economic Environment:

Language:

The predominant language of the district is Punjabi, which according to the 1998 census results for the tehsils of Sheikhupura, Ferozewala and Safdarabad, is the first language of 98% of the population, while Urdu is the first language of 1.1%.

Education:

SCHOOLS						
Schools	**H. Sec**	**High**	**Middle**	**Primary**	**sMosque**	**Total**
Male	06	64	72	536	19	697
Female	08	65	117	360	01	551

Demography:

According to 2017 census the population of the district has 517,850 households and its population reached to 3,460,426 of which 1,789,956 are males and 1,670,310 are females. This census shows that 2,258,636 persons live in rural while 1,201,790 live in urban areas. It is further reported that there are number of transgenders in this area.

Administrative Units	Households	Population 2017				Population 1998	Sex Ratio	1998-2017 Avg. annual Growth Rate
		Male	Female	Transgender	All sexes			
District	517,850	1,789,956	1,670,310	160	3,460,426	2,276,164	107.16	2.22
Rural	334,617	1,171,760	1,086,810	66	2,258,636	1,561,422	107.82	1.96
Urban	183,233	618,196	583,500	94	1,201,790	714,742	105.95	2.77

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

Health Services:

District Sheikhupura	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
Sheikhupura Tehsil	06	626	05	-	05	80	31	56	-	-	-	-	04	04
Ferozewala Tehsil	01	60	04	-	01	20	14	28	-	-	-	-	-	-
Muridkay Tehsil	01	68	03	-	01	-	17	34	-	-	-	-	-	-
Sharaqpur Tehsil	03	120	-	-	01	-	06	12	-	-	-	-	-	-
Safdarabad Tehsil	01	60	02	-	01	20	14	28	-	-	-	-	-	-

Safe Drinking Water:

Water is crucial for all forms of life and is required in almost all human activities. It is now universal human right to gain access to clean and safe freshwater (United Nations Committee on Economic Social and Cultural Rights, 2003). About 70% of people in Pakistan use ground water for domestic usage (Malik et al, 2010). 20 to 30% of all hospital cases and 60% infant deaths are due to water borne diseases (Government of Pakistan, 1999).

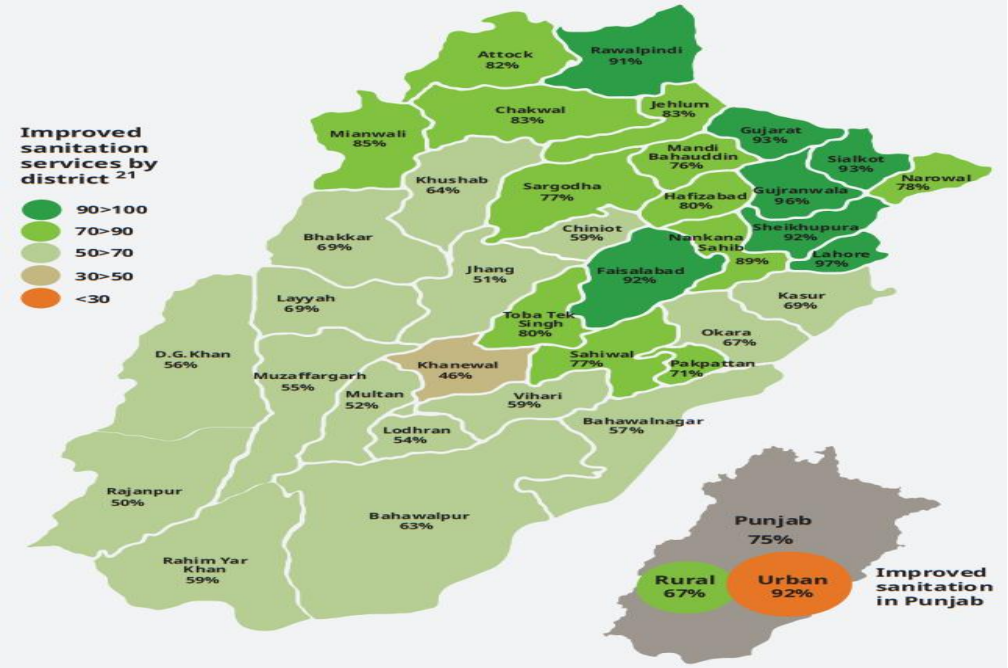
https://www.wateraid.org/pk/sites/g/files/jkxoof326/files/WASH%20factsheet%20Punjab.pdf

Waste water disposal:

As per Punjab MICS 2017-18, 95.8% 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	26.7
Septic tank	67.9
Pit latrine	1.1
DK where	0.1
Ventilated improved pit latrine	0.1
Pit latrine with slab	0.0
Pit latrine without slab/ Open pit	0.1
Bucket	0.0
Open drain	1.4
Other	0.4
DK/ Missing	0.1
Open defecation (no facility, bush, field)	2.2
Total	**100.0**
Percentage using improved sanitation	**95.8**

Ref: *(MICS, Punjab 2017-18)*



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

Industry:

Punjab has numerous large industrial concentrations such as in textiles, leather and light engineering goods. There are also geographically distinct industrial clusters in the province, the most famous of which is the 'industrial triangle' which includes Gujranwala, Sialkot and Gujrat. In total there are seven industrials zones/clusters in Punjab, these are, Lahore, Gujranwala, Faisalabad, Sialkot, Sheikhupura, Wazirabad and Islamabad/Rawalpindi.

The three main industries in Sheikhupura district are textile, food and machinery and equipment. Across clusters, Sheikhupura and Faisalabad are clear outliers; more than 80 percent of the firms in these industrial zones reported electricity shortages to be the most serious obstacle to their business. Although more than 80 percent of firms in Sheikhupura reported electricity as the most serious constraint, the losses reported by firms in that zone were on average around 7 percent which is the lowest in the Punjab. Sheikhupura is among the least affected districts by macroeconomic instability.

Ref: *Constraints faced by Industry in Punjab, Pakistan (2012)*

INDUSTRIES IN DISTRICT SHEIKHUPURA	
Textile	139
Chemical	44
Board & Paper	51

Steel	72
Flour	24
Medicine	26
Rice Mills	97
Fertilizers	02
Auto industries	25
Others	289
TOTAL	**769**

Ref: https://sheikhupura.punjab.gov.pk/district_profile

Agriculture:

Major crops and fruit of district Sheikhupura are sugarcane, wheat, rice and guava. A variety of vegetables are also grown in the district. There are 23 flour mills, 93 rice mills, 4 fruit juices, 4 solvent extraction units and 15 vegetable ghee/cooking oil units already operating in the district. In view of the availability of various raw-materials and existing industries, there exist little additional scope for flour mills and rice husking units. However, there exist good prospects for fructose from rice bran, rice husk briquettes, corn oil, furfural from maize cobs, fruit juice/pickles/squashes and vegetables dehydration units.

Ref: https://sheikhupura.punjab.gov.pk/agriculture

Social Setup:

Punjabi is the main language spoken in the district. More than 99 per cent of the population is Muslim, with small minority communities including Christians and Sikhs.

Men are the dominant force in the household, with final say in the affairs of all members of the family. Women, by comparison, play a subservient role and observe *pardah* (veiling) especially in rural areas compared to urban setup, where women freely move and participate in different social activities.

Poverty:

DISTRICT SHEIKHUPURA INCIDENCE OF POVERTY FROM 2004-05 TO 2014-15 (%)		
2004-05	**2008-09**	**2014-15**
38.3	30.6	21.4
DISTRICT SHEIKHUPURA MULTIDIMENSIONAL POVERTY INDEX (MPI) 2014-15		
MPI	**Incidence (H)**	**Intensity (A)**
0.093	21.4%	43.5%

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

CHAPTER # 5
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.

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 Project	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
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

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 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.

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.

ANALYSIS OF IMPACTS AND RECOMMENDED MITIGATIONS

The project activities during construction phase will involve clearing of vegetation along the route alignment wherever required, excavation for installation of towers, erection of towers, civil works related to transmission line and line stringing. For Grid station, it will involve excavation for building and equipment foundations, civil works and erection of equipment.

During the operation phase, most of the construction phase impacts will get stabilized and the impacts will be restricted only to the operation and maintenance of the project.

Environmental Impacts due to project location

Proposed 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 transmission of electricity in the same area.
- The project will provide the jobs to the local residents as well as to those from the suburban areas.

Environmental Impacts due to the project design

Subject project is the proposed installation of 132 KV AIS (Air Insulated Substation) Grid station a project of Diamond Fabrics Limited at Diamond Fabrics Limited 26km Faisalabad Road, Sheikhupura. Firefighting plan, health & safety plan, tree plantation plan, emergency response plan will be incorporated during the designing phase of the project. The subject project will consist of;

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

- Soil structure and soil bearing capacity
- Road infrastructure design
- Emergency exit in the proposed project
- Firefighting system
- 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.
- 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:

- **Grubbing and stripping**

Grubbing and stripping may be a minor and short term impact on the physical environment during the construction phase. It may also be a health and safety hazard for the people at or near the project site.

- **Leveling and compaction of the land**

Leveling and compaction of the land is also a short term and minor impact on the physical environment and it may also be a health and safety hazard for the workers.

- **Demarcation of project building and other facilities**

It may also be a minor impact on the physical environment due to the subject project.

- **Generation of dust during loading and unloading of construction materials**

It is also a minor and short term impact on the physical environment and also for health and safety, which may arise during the construction phase.

- **Generation of noise on account of vehicular use and construction activities**

It is also a minor and short term impact on the physical environment and also for health and safety, which may arise during the construction phase.

- **Gaseous emission due to the vehicles**

It may also be a minor impact on the physical environment during the construction phase, if vehicles are not properly tuned.

- **Safety of construction workers, people in the surroundings and passersby**

Health and safety issues may arise during the construction phase if proper precautionary measures will not be taken.

- **Any outbreak of fire due to electrical and other failures**

This issue may arise due to carelessness or improper management, and it may be a serious hazard which may affect the environment or may also cause the loss of property or life.

- **Solid waste generation due to domestic and construction activities**

Solid waste generation due to domestic and construction activities may be a negative impact on environment if not managed properly.

- **Wastewater generation from the domestic and constructional activities**

Wastewater generation due to domestic and construction activities may be a negative impact on environment if proper wastewater treatment and management system will not be implemented.

- **Ground water quality**

Ground water quality may be affected by the development if proper mitigation measures will not be implemented.

- **Impacts on Fauna and Flora**

Construction will impact the flora/ vegetative cover and fauna present at the project site.

- **Security threat**

Security issue is a major socioeconomic impact which may arose during the construction phase.

- **Impact on land value**

Construction of the subject project may cause positive or negative impact on the land value.

- **Dislocation of the people**

Construction of the subject project may cause the dislocation of the local people if any, which is a negative impact on the socioeconomic environment.

- **Loss of public and private infrastructure**

Construction of the subject project may cause loss of public and private infrastructure if any, which is also a negative impact on the socioeconomic environment.

Impact significance: moderate to high or may be negative
Nature of impact: direct
Duration: Short Term
Timing: Construction phase
Reversibility: NA
Likelihood: moderate
Consequences: moderate

Mitigation Measures and Recommendations

- Precautionary measures should be adopted to save the environment from the impacts of grubbing, stripping, leveling and compaction and health and safety of workers should be ensured during the construction phase.
- Demarcation of the project building and other facilities should be according to the laws and regulations.
- Sprinkling of water on dusty tracks is recommended to avoid the generation of dust on dusty tracks.
- Vehicles should be properly tuned to reduce the impacts of dust and noise.
- Proper mitigation measures should be taken to reduce the noise generation during the construction activities.
- PPEs i.e. ear muffs, helmets and masks etc. should be provided to workers to ensure their health and safety during the construction activities.

- Precautionary measures should be taken to reduce the local flooding due to over-use or leakage of pipes.
- Health and safety of construction workers, people in the surroundings and passersby must be ensured.
- Precautionary measures should be taken to avoid any outbreak of fire due to electrical and other failures.
- Constructional waste should be used for landfilling purposes.
- Domestic solid waste should be kept in dust bins and should be handed over to local contractors.
- Wastewater treatment facility (septic Tank) should be incorporated in the design of the project to treat the wastewater produced due to constructional and domestic activities before the final disposal.
- Add more vegetation to restore the land by more plantations.
- Essential services like water supply, sewerage disposal and solid waste management must be in working condition.
- Construction timings should be scheduled to cause minimum disturbance to neighbors.
- Because of presence of security guards round the clock the security at the project site will be improved as well as in its vicinity. Impact will be moderate positive.
- Land value in the surrounding area will increase due to completion of the present project. Impact will be moderate positive.
- The project does not involve dislocation of the people. There is no requirement of resettling a single person. Impact is nil.
- No movable or immovable property and infrastructure of public and private sectors will be lost or damaged during construction and operation stages. Impact will be nil.

Impact on Physical Resources

Impact on Topography

During the installation of the transmission line and substation, the topography will change due to excavation and erection of tower, fill and cut for leveling the tower erection place. The most prominent impact on the surface topography will be due to the removing of the vegetation at the tower erection site and all along the Right of Way for construction facilitation.

This will lead to change in the surface features only. The impact will be irreversible as the present features along the 15m Row will be changed due to presence of the transmission line.

No topographical changes are envisaged during the operation phase of the transmission line and the substation. The existing access routes will be utilized during the operation and maintenance of the transmission lines.

Impact on Environmental Resources

Impact on Air Quality

During the construction phase, the activity would involve excavation for the tower erection, movement of transporting vehicles carrying the construction materials etc. along the haul road (through un-built roads, but are not maintained). At majority of locations, movement of heavy vehicles may not be possible; from approach road to construction site material will be head loaded. All these activities would give rise to emission of dust particles thereby affecting air quality marginally at the site which will be transitory in nature.

Mitigation Measures

Sprinkling of water during excavation will reduce the dust emission to a great extent.

The operation of transmission line and the Grid station will not have any negative impact on the air quality of the region.

Impact on Noise Levels

During the construction phase, the major sources of noise pollution are movement of vehicles transporting the construction material and equipment to the site. Most of the access roads along the alignment are feasible for motor vehicles. The major work of the construction is expected to be carried out during the day time. Heavy load of traffic and public access. People shall be fairly warned about the severity of the works.

Mitigation Measures:

Following measures will help to keep noise and vibration in acceptable level during Construction phase:

- Contractor shall equip their heavy construction equipment and plants with exhaust silencers to limit the engine noise so as not to exceed 75 dB

(compacters, loaders, vibrators and cranes) and regularly maintain all construction vehicles and machinery that should meet the Punjab Environmental Quality Standards.

- Contractor shall limit working time for activities that create noise only from 7.00 am to 8.00 pm except for construction site near public sensitive receptors. Construction related activities closer to sensitive receptors have to be scheduled in coordination with the relevant authorities. During the operation phase of the project, there will be corona noise from the conductors which will be felt only up to 15 to 30 m area; hence the ambient noise level shall meet the 85dB limit of NEQS.

Impact on Surface Water Quality

The construction and operation of the transmission lines will not have any significant impact on the surface water quality in the area since no surface water body was found. Proposed activities will create temporary impacts to the existing drainage system in the area. Stagnation of water will also create temporary breeding sites to mosquitoes, which will have direct impact on public health.

Mitigation Measures:

Ensure that minimum water is lost during construction activities and no water remains stagnant at any place.

Impact on Ground Water Quality

Ground water contamination might take place during construction activities. In case of an accidental spill or maintenance works of vehicles, machineries and different components of the transmission line and grid station; chemical substances and oily wastes, which are often used in the construction vehicles and machineries, may leach into the soil and percolate to the ground water. In rainy seasons, the quality of soil is vulnerable since the porosity increase and leachate formation is escalated which may eventually bring an impact on the ground water resources.

Mitigation Measures:

Thus following measures will be required in order to prevent deterioration of water from the construction and construction related activities:

- All construction vehicles and equipment should be maintained in proper conditions to avoid any leakage
- Contractors shall use silt traps and erosion control measures where the construction is carried out in close proximity to the water bodies to avoid cement particles, rock, rubbles and waste water entering the surrounding water bodies.
- Construction activities should be restricted to dry season.
- All liquid raw materials and semi-liquid components must be kept at impermeable floorings and covered properly with appropriate labeling which shall avoid any leakage that might occur due to accidental spill or rain water runoff.

Impact on Soil and Geology

Project activities including excavation, cut and fill operations, removal of trees and green cover vegetation etc., will enhance the soil erosion during the rainy season. Removal of trees and green cover vegetation will reduce infiltration rate of rainwater. The impact on soils will be due to the soil erosion at the tower construction site and along the access routes. Excavation activity and land clearance in the erosion prone areas have to be minimized while conducting site selection for towers. Leveling and stabilization of tower construction sites will be done after completion of construction activity which will avoid surface runoff and damage to the topsoil.

Mitigation Measures:

The impact associated with landslides due to excessive erosion and other civil works can be avoided or minimized by following mitigation measures:

- Maximum effort should be taken to minimize removal of trees and green cover vegetation.
- Minimize obstruction or destruction to natural drainage pattern of the surrounding area.
- Proper treatment of clearing and filling areas against flow acceleration
- Turfing work should be taken prior to rainy season around the Grid station.
- Contractors shall restrict cut and fill operation around sharp/deep slope areas.
- Top soil (2-3 cm from the top of the soil), which is removed during construction from the cultivated lands must be stored separately for future utilization of cultivated lands near tower leg locations.

Impact on Ecological Resources

There is no national wildlife park, bird sanctuary, wetland in the route alignment of the proposed transmission line. The study area for route alignment has sparse plantations area. The ecological impacts are briefly described in the following sections

Effect on Flora and Fauna

None of the declared environmentally sensitive areas is located within the project-affected area since it is an urban settlement. Migratory paths of small mammals and reptiles may be affected due to construction activities. However, noise, vibration and emission from construction vehicles, equipment will occur during construction and pre-construction stages in temporary manner.

Mitigation Measures:

The impacts related to above activities are temporary and can be mitigated through following measures:

- Strict attention on worker force regarding disturbance to surrounding habitats, flora and fauna including hunting of animals and unnecessary cutting of plants
- Construction activities must begin with low intensity which may serve as an early warning system for the fauna to leave the area and go to safer areas
- Ensure habitat conservation by avoiding dumping of construction and sanitary waste like debris, bricks, gravel, litter, food leftovers in open areas and seek a place with the municipal office to extricate a place to release them.

Impact on Terrestrial Ecology

There is no sensitive ecological area / protected forest area such as national wildlife park, or bird sanctuary crossing the proposed route alignment. The removal of herbaceous vegetation from the soil and loosening of the top soil generally causes soil erosion. However, such impacts would be primarily confined to the project site during initial periods of the construction phase.

Mitigation Measures:

These would be minimized through adoption of mitigation measures like paving and surface treatment and water sprinkling.

Removal of Trees

No plant species will be removed from the area. The initial construction works along the alignment involving land clearance, cutting, filling, and leveling may cause loss of vegetation. This will be irreversible impact.

Mitigation Measures:

Care has been taken to avoid the thick plantations/vegetation as far as possible and tower locations are selected at plain paddy fields where the vegetation is thin. This will minimize the tree loss. Replanting of similar species with the ratio of 6 against 1 will be implemented.

Effect on Local Road Network

Transformers, tower material, substation equipment, iron bars, concrete materials, equipment etc. will be transported through the provincial and local road network to the project site. Heavy transportation vehicles might disturb the local traffic specially at peak working hours. Excavation at roads will bring impact on traffic flow and also lead to traffic jams. Visibility is usually minimum during night time where there are less street lights, this will pose as a hazard for the local traffic travelling in night time.

Mitigation Measures:

- Contractor should properly maintain all road sections, which will be utilized for the construction related activities
- Construction vehicles will only be allowed to operate at times when there is minimum traffic load
- The site that has to be excavated will be barricaded by means of safety signs and symbols, such as using reflectors to improve indication of excavated sites in night time
- Diversion routes must be allocated for normal and construction vehicular traffic to maintain normal traffic flow
- Emergency routes must be kept clear and ensure that they are easily accessible.

Impact on Human Environment

Health and Safety

Health and safety is one of the major concerns during the construction and operational phase, almost all activities are having potential to cause harm, this

includes; Manual lifting of construction material resulting in severe body pains as well as work related stress.

The activities like manual lifting, lifter operation as well as operations of other construction vehicles and other activities associated with construction and operation phase will enhance the work related stress. The accidents may be caused due to electrocution, lightening, fires and explosions. The local people living nearby the site where excavation and erection has to be done are more susceptible to road side accidents and noise. Improper lifting of extra tools and storage, while erecting towers is a potential hazard. The accidents may be caused due to electrocution, lightening, fires and explosions.

Mitigation Measures:

- Organize awareness programs relevant to personal safety of the workers and public in the area
- Installation of warning signs to particular locations such as transverse points of local road network by transmission lines, additional workers and general people specifically children will not be entertained for accessing the work place especially during erection
- Necessary training regarding safety aspects to the personnel working at the line will be provided by the contractor
- Ensure that hazards associated with manual lifting are controlled by proper lifting techniques, work rotation system will reduce the chances of being exposed to work related stress associated with construction activities
- All the workers involved in construction, operational and maintenance activities will be provided with proper PPEs including; safety belts, footwear, helmets, goggles, eye shields, and clothes to workers depending on their nature of work
- During operational phase it will be ensured that the site having high electrical voltage will be barricaded by means of impermeable walls, this would reduce the probability of being exposed to severe electrical shocks
- Only trained operators will be allowed to access high voltage area.

Socio-Economics

Social services like road, traffic, utility lines as well as routine market activities and general business may be affected, however the impact is only limited to the construction phase. The positive impact during construction of transmission line will generate local employment, as number of unskilled labors (men/women) will be

required at the time of construction activities, in summary there is no major impact on social environment, rather it is a developmental activity for the benefit of community.

Mitigation Measures:

The following measures will have to be taken:

- Advance notice to the public as well as major utility providers about the time and the duration of the utility disruption, and restore the utilities immediately to overcome public inconvenience
- Alternate routes should be planned and will be kept clear to keep the traffic and general public services in flow and momentum.

Construction Waste

Construction waste management

Almost all the activities from excavation to erection will generate waste, however the waste will be of inert nature, in addition the waste will mainly comprise of cement and concrete waste, the concrete material resulting from batching and mixing will harden the ground surface resulting in growth inhibition of plant growth. This would also result in unaesthetic environment of the site.

Mitigation Measures:

Thus following measures are needed to protect and enhance the quality of environment during the construction stage:

- It is strongly recommended that waste should be reduced at source and by reusing the residual waste
- It will be ensured that waste will be segregated and collected, however recyclable waste will be sent to the recycling industry to generate revenue
- The waste which cannot be reused or recycled will be dumped to the proper and allocated containment facility

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.
- EMFs generation at the operational phase when the current is passed from the lines
- EMF causes changes in flight directions of migratory birds

- EMF has some effects on human health, such as neuropsychological disorders or cardiovascular diseases.
- 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.

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

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.
- Appropriate cabling with protective shields to suppress electron flux
- Health-based exposure limits must be mandated to protect public health
- A labeled zone shall be highlighted to indicate EMF in the area.
- 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 contractor.
- Sludge from septic tanks will be handed over to contractors.
- Electricity monitoring/Thermography should be conducted by the proponent quarterly for the safe supply.
- Project proponent should submit all the monitoring reports in the EPA Punjab for the compliance of the PEQS.

Electro Magnetic Fields (EMF)

EMFs are generated at the operational phase when the current is passed from the lines. There are no significant impacts on the environment but there are some aspects of minor concerns. EMF causes changes in flight directions of migratory birds. Moreover, referenced from WHO research archives, it is found that EMF has some effects on human health, such as neuropsychological disorders or

cardiovascular diseases, but the data is not sufficient to confirm the risks, however more research is being done in this regard.

Mitigation Measures:

There are no mitigations to consider, however the following steps can be taken to Minimize any possible risks:

- Appropriate cabling with protective shields to suppress electron flux.
- Health-based exposure limits must be mandated to protect public health.
- A labeled zone shall be highlighted to indicate EMF in the area.
- Telecommunication service providers must be alerted about the activities and the level of EMF in the corridors and around stations to minimize exceeding levels in other communication devices.

Electric shock

This may lead to death or injury to the workers and public in the area.

Mitigation Measures:

This can be minimized or avoided by:

• Security fences around Grid station and looping areas

• Display of warning signs

Noise Generation

Nuisance to the community around the site can occur during the project implementation stage.

Mitigation Measures:

- Workers and operators, working in close proximity to the grid station will be provide adequate PPEs
- General public will be restricted to stay away from those areas to a safe zone
- Construction activities must be limited to day time and avoided at night
- Properly tuned vehicles and machineries will be used for all construction activities to reduce noise generation.

Oil Spillage

Contamination of water on land/nearby water bodies by the transformer oil can occur during operation due to leakage or accident.

Mitigation Measures:

Substation transformers will be located within secure and impervious areas with a storage capacity of 75% spare oil. Also proper drainage facilities will be constructed to avoid overflow or contamination with natural flow paths.

-

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.
- Waste water will be treated through waste treatment system that will be installed within the premises of the subject project.
- 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.

- First aid facilities will be made available.

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 Diamond Fabrics 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:

Diamond Fabrics 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:

Management of Diamond Fabrics 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

An Environmental Management Plan (EMP) is a framework for the implementation and execution of mitigation measures and alternatives. It usually covers all phases of the project, right from pre-construction to the operation and maintenance phases of the transmission line project. The plan outlines mitigation measures that will be undertaken to ensure compliance with environmental laws and regulations and to eliminate adverse impacts. The objectives of an EMP, thus, are:

- To ensure that mitigation measures are implemented;
- To establish systems and procedures for this purpose;
- To monitor the effectiveness of mitigation measures;
- To ensure compliance with environmental laws and regulations;
- To take any necessary action when unforeseen impacts occur

CHAPTER # 6
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:
- Ensure the complete implementation of all mitigation measures.
- Ensure the effectiveness of the mitigation measures.
- Provide a mechanism for taking timely action in the face of unanticipated environmental situations.
- 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.

Environment Management team

Following functionaries will be involved in the implementation of EMP:

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

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.

Equipment Maintenance Detail

The subject project is the installation of 132 KV AIS Grid station a project of Diamond Fabrics Limited at Diamond Fabrics Limited 26km Faisalabad Road, Sheikhupura. 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.

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.

Company will allocate the 2% of the total cost as Environment Budget for the Training, maintenance and management of Environment that will include filling and maintenance of equipment's, restoration, plantation, and availability of PPEs, strategic planning to cope with any emergency situation and formulate the disaster management plan to cope with natural disaster. Any equipment or devices failure or replacement will not be included in this budget.

Proposed monitoring program to asses performance or output of EMP

Monitoring for following Environmental Parameters is recommended:

- **Ambient Air**
  Monitoring for ambient air should be conducted on regularly 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 monthly 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.

Proposed EMP reporting and reviewing procedures

To oversee the environmental performance of the project through its lifecycle to 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.

HSE manager is responsible for reviewing the performance of the project with respect to the guidelines mentioned in EMP. Internal audits should be done on biannual bases to check to the project performance with respect to the guideline proposed in the EMP.

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

Description of impacts and proposed mitigation actions:

Aspect	**Impacts**
CONSTRUCTION PHASE	
1 **Land Disturbance**	
• The potential problems that can arise from the installation of underground cable is the land disturbance.	There is possibility of land disturbance at project area. It is expected that there are small chances of change in land at project area. The only change in land use for underground cables installation will be due to earth works and excavation activities which may damage paved road.
Mitigation Measures	➢ Earth work should be technically designed according to geological feature of project site. ➢ Obtain all the exact approved routes and locations which have been selected for grid station and shall issue "Notices of intent" to all concerned authorities at least four weeks prior to commencement of the work, such as the employer, Municipality, Telecommunication Department, Traffic police, etc. Also excavate the material with care to avoid damaging the existing services and electric cables. ➢ Excavation operations shall be confined to a minimum working area consistent with efficient operations. ➢ Damage to road, footpaths, ditches, etc caused by the project activities should be repaired during completion of earth work on immediate bases. ➢ The trenches (excavated area) shall be located exactly within the approved

		reservation and no more than two adjacent sections of excavated trench shall be open at a time. ➢ Restore the paved and unpaved roads. Road need to be paved and backfilled rapidly and properly where cable transmission line is installed.
2	**Ambient Air Quality**	
	The potential problems that can arise is the dust emissions from the excavated material and Gaseous emissions from the construction equipment's/vehicles.	Fugitive dust emission from construction activities like excavation, trench foundations, backfilling or road leveling. Gaseous emission from the construction equipment's, power generators, moving equipment's and erection machinery. After removal of top soil and vegetation cover, soil does have to tend erosion and dispersive potential which is proportional to environmental risk.
Mitigation Measures		➢ Use dust abatement techniques on unpaved, unvegetated surfaces to minimize airborne dust and during earthmoving activities, prior to clearing, excavating, backfilling, compacting and grading. ➢ Excavated material need to be disposed off away (which is not in use) from the construction area to prevent dust emission. ➢ Dust emissions from soil piles and aggregates storage stockpiles will be reduced by appropriate measures. These may include by sprinkling of water at appropriate frequency and erecting the windshield walls on the three sides of piles. ➢ Post and enforce speed limits to reduce airborne fugitive dust caused by vehicular traffic. ➢ Cover construction materials and stockpiled soils if they are a source of fugitive dust. ➢ Workers and drivers should wear dust masks and safety goggles during dry and windy

		weather conditions to avoid health risks.
3	**Noise pollution**	
	The potential problems that can arise from the noise from the construction equipment/vehicles. Noise produces by transportation and erection of material as well as during construction and installation of cable.	➢ Material loading/unloading vehicles and other transport used by contractors. ➢ While construction noise can be unwelcome during night time in residential areas when people are trying to sleep, sometimes it may be too loud, be impulsive, and interrupt people's activities. Contain annoying pure tones; occur unexpectedly and at undesirable times of day
Mitigation Measures		➢ If the right-of-way is in a residential area, construction hours and the amount of equipment operating simultaneously may need to be limited to reduce noise levels. ➢ Noise pollution due to construction works should be controlled by completing this task in a short period of time and also be confining it to day time hours. ➢ Use of noise barriers or noise canceling acoustic devices should be considered as necessary. ➢ Site labor working in high noise area such as where noise level exceeds limit, should wear earplugs. ➢ Blowing of horn by the project related vehicles should be strictly prohibited.
4.	**Ground water Contamination**	
	Sewage water line leakages/damage, grey water (used in construction) by project activities.	Sewage water leakages or sewage pipe damages during excavation work of trenches which can contaminate ground water quality.

Mitigation Measures		➢ In case of incidental leakages from sewage line, it is recommended that leakage line should be replaced to reduce the ground water contamination and leachate formation. Also use municipal tankers to collect water filled in excavated/trench area. ➢ Before any earth work consult with concerned department. ➢
5	**Sewage Water Line**	
	Sewage water line leakages/damage, grey water (used in construction) by project activities.	➢ Sewage water leakages or sewage pipe damages during foundation excavation and grey water may contaminate water. Improper excavation may cause deteriorate water quality.
Mitigation Measures		➢ Before any excavation work take inform the concerned Departments. ➢ Excavation techniques should be efficient to avoid water utility damage ➢ Avoid any damage of sewage and other utilities which may cause water contamination
6	**Soil and Land Contamination**	
	Oil, lubricant chemical spillage, construction debris and damages of sewage line may cause land contamination.	Spillage of Oil, lubricant and spillage may cause soil contamination, slippery surface and Soil contaminated with over spill of sewage water by damaging sewage line.
Mitigation Measures		➢ The secondary containment facility should be available to avoid any spillage or fire hazard and material should be stock according to the inventory requirement. ➢ Construction debris should be collected and dispose off properly ➢ Avoid any damage to sewage and other utilities which may cause land and soil

		contamination
7	**Solid waste**	
	Lubricants and chemicals, construction debris and other waste installation material (metal, wooden, plastic & cable pieces, excavated (dredging) material and packaging material	Debris, vegetation, excavated soil, scraps metal from the equipment fabrication and waste from domestic nature from workers activities in construction camps may cause land contamination, slippery site surface and harm natural environment, Excavated material with trench may slide on workers, choking of drains, etc.
Mitigation Measures		➢ Use waste minimization techniques to reduce, reuse & recycle waste material. ➢ Excavated materials should be segregated from other wastes to avoid contamination thereby ensuring acceptability for refilling and avoiding the need for disposal at landfill. ➢ Arrival of materials and products should be planned, according to designated place on site and to production requirement ➢ Raw material inventory records should be maintain and avoid excessive stocks. ➢ Stockpiles of sand, gravel, soil and other similar material should be managed properly so that they do not spread and cannot be washed in the adjacent drain/street ➢ Integrated waste management plan should be prepared to minimize a waste generation ➢ Hazardous waste should be stored in identified mark with air tight lid container. ➢ Waste disposal should be according to nature of the waste with contractor.
8	**Ecological Impacts**	
	Underground Transmission Line &	No major vegetation clearing will be carried out during the excavation, foundation and line

	Grid Station Ecological disturbance from project activities.	installation phase except for common vegetation which is also in negligible quantities. The plants species within the vicinity of the proposed site are of minor ecological importance. Possibility of marine birds to perch on the corners of shore is considered.
Mitigation Measures		➢ Construction techniques should be environment friendly to minimized local vegetation clearance of the project site. ➢ Clearance of vegetation to be kept minimum. ➢ Avoiding night construction whenever possible to minimize fauna disturbance. ➢ The trenches should be properly covered to avoid any incidents of livestock and other animals. ➢ Wild life should not be harmed from project activities ➢ Birds will not be affected as they will be relocating to adjacent suitable habitats.
9	**Health & Safety**	
	Incident may occur in case of improper management and work practices	Excavation way may interfere by numerous public utilities and service systems including water, sewer which may cause incidents and fire hazard by electrocution, fractures gas and dust emissions may harm far community, Structure collapse, accidents during transportation, handling, installation of high transmission line and land (excavated material sliding may cause serious injury).
Mitigation Measures		➢ Establish and maintain a safety and health program for the worksite ➢ Provide adequate systematic policies, procedures, practices ➢ Health and safety Impact assessment should be prepared before starting project activity to prevent hazards to workers or nearby community.

	➢ Contractor should be aware of health hazards from project activities. ➢ Contact with concerned department before starting excavation ➢ Surface encumbrances that create hazards must be removed/supported ➢ Employees must be trained to operate heavy equipment ➢ Use barricades, hand or mechanical signals, stop logs to keep operators safe ➢ Barricades should be used at excavated site ➢ Appropriate PPE's should be providing to workers. ➢ Safety sign boards should be placed for construction work and traffic safety purpose at project site. ➢ Preliminary safety precautions should be taken before earth work ➢ Workers are prohibited from entering excavation sites with accumulated water unless adequate protection has been provided ➢ Keep surface materials at least 2 feet away from the edge of excavation sites. ➢ Understand the minimum approach distances outlined for specific live line voltages ➢ Ensure proper use of special safety equipment and procedures when working near or on exposed energized parts of an electrical system ➢ Retrofitting existing transmission or distribution systems by installing elevated perches, insulating jumper loops, placing obstructive perch deterrents, changing the location of conductors, and / or using raptor hoods ➢ The worker is properly isolated and insulated from any other conductive object (live-line work).

10	**Traffic**	
	Traffic flow in the project vicinity slightly increases during the project activities of project construction.	Construction proposed activities would temporarily affect transportation facilities within the project area. Construction is likely to cause temporary traffic delays.
Mitigation measures		➢ During construction stage, the contractor should organize detailed temporary traffic management schemes using updated traffic counts and on-site trial runs for the works. Use temporary traffic management schemes to be approved by the relevant authorities prior to its implementation. ➢ Heavy equipment should be transported in the early morning. ➢ Vehicles will be maintained regularly to reduce emissions.
11	**Social impacts**	
	Incidents by opening the trenches or by the construction vehicular movements	Visual and auditory disturbance due to the presence of machinery, construction workers and associated equipment
Mitigation measures		➢ People to be informed about the construction activities and surveys. ➢ Impacted people to be given Preference for local employment as labor. ➢ Compensation to be paid on time and based on the prevailing market rates. ➢ Community should involve during all project activities. ➢ Contractor should inform before any earth work to residents of project sites. ➢ Incidents should be avoided and construction vehicles should be placed at designated areas to avoid any incident.

12	**Geo Hazards Earthquake**	
	Grid Station Could cause any Towers to fall.	Limited potential for harm unless people were very close to the line.
Mitigation measures		➢ Maintenance of 30-meter buffer zone for houses. ➢ Foundation/maintenance should be inspected periodically. ➢ Emergency system should be efficient in working condition
13	**Meteorological impacts**	
	Equipment's and construction structure caused by heavy rainfall, flooding & wind storms.	Excavated material in wind storms may harm the environment. Improper back filling may cause serious incidents in rainy season Rainfall may affect the construction work. Heavy rain have tendency to collapse foundation or trench structure.
Mitigation measures		➢ Safety measures should be efficient in case of any natural hazards. ➢ Prohibit the construction work during heavy rainfall, flooding and windstorms.
POST DEVELOPMENT PHASE		
1	Meteorological impacts	
	Equipment's and construction structure caused by heavy rainfall, flooding & wind storms.	➢ Damage lines may fall on the residents which may cause any serious conditions. ➢ Improper back filling may cause serious incidents in rainy season ➢ Heavy rain have tendency to collapse foundation or trench structure. ➢ These hazards may work as a medium between ground objects and energized conductors. This may cause any serious incident.
Mitigation Measures		➢ Safety measures should be efficient in case of any natural hazards.

		➢ Prohibit the maintenance work during heavy rainfall, flooding and windstorms.
3	Electric and Magnetic field	
	Underground Transmission Line & Grid Stations there is public and scientific concern over the potential health effects associated with exposure to EMF.	There is no empirical data demonstrating adverse health effects from exposure to typical EMF levels from power transmissions lines and equipment. However, while the evidence of adverse health risks is weak, it is still sufficient to warrant limited concern.
Mitigation Measure		➢ Identification of potential exposure levels in the workplace, including surveys of exposure levels in new projects and the use of personal monitors during working activities. ➢ Training of workers in the identification of occupational EMF levels and hazards. ➢ Establishment and identification of safety zones to differentiate between work areas with expected elevated EMF levels compared to those acceptable for public exposure, limiting access to properly trained workers. ➢ Considering sitting new facilities so as to avoid or minimize exposure to the public. Installation of transmission lines or other high voltage equipment above or adjacent to residential properties or other locations intended for highly frequent human occupancy, (e.g. schools or offices), should be avoided. ➢ EMF can be reduced by Shielding with specific metal alloys, Increase depth of cables and modifications to size, spacing, and configuration of conductors ➢ Since Pakistan does not have PEQS for EMF levels, it is suggested to follow international standards of WHO, IFC etc.

4	**Oil Spillage**	
	Transformer oil spillage can occur during operation due to leakage or accident.	Contamination of land and soil of the facility Leaching into water bodies located nearby grid station
Mitigation Measure		➢ Substation transformers will be located within secure and impervious areas with a storage capacity of 100% spare oil. ➢ Proper drainage facilities will be constructed to avoid overflow or contamination with natural flow paths.
5	**Health and Safety**	
	Grid Station Towers or bays Incident may occur in case of improper management and work practices	Towers or bays may interfere by numerous public utilities, fire hazard by electrocution and Structure collapse maintenance of high transmission line.
Mitigation Measure		➢ Establish and maintain a safety and health program for the worksite ➢ Provide adequate systematic policies, procedures, practices ➢ Health and safety Impact assessment should be prepared before starting project activity to prevent any incident hazards to workers or nearby community. ➢ Contractor should be aware of health hazards from project activities. ➢ Employees must be trained before working with heavy voltage lines during maintenance. ➢ Use barricades, hand or mechanical signals, illuminants painted towers for traffic safety in night hours, stop logs to keep operators safe ➢ Appropriate PPE's should be providing to workers during maintenance work.

	➢ Implementation of a fall protection program that includes training in climbing techniques and use of fall protection measures; inspection, maintenance, and replacement of fall protection equipment; and rescue of fall-arrested workers, among others. ➢ Understand the minimum approach distances outlined for specific live line voltages ➢ Ensure proper use of special safety equipment and procedures when working near or on exposed energized parts of an electrical system ➢ The worker is properly isolated and insulated from any other conductive object (live-line work).

ENVIRONMENTAL MANAGEMENT PLAN

Aspect	Impact	Mitigation	Monitoring parameters	Location	Monitoring	Frequency monitoring	Responsibility
Construction phase							
Air	Chronic health affects Reduced visibility on roads	Sprinkling of water Tuning of construction vehicles & machines Dust masks for laborers	Particulate Matter Smoke CO, Sox	All project locations	Vehicular emissions Dust Ambient air quality	Quarterly for emissions and daily for dust	HSE Manager/ Proponent
Noise	Stress Hypertension Hearing loss Headache	Avoid working at night Lubrication of construction vehicles Ear plugs	Noise levels	Project location close to residential areas	Noise monitoring device		HSE Manager/ Proponent
Land & Soil	Erosion due to excavation Formation of pits due to improper backfilling	Proper backfilling and stone pitching around the excavated site if required	Surface topography	All project locations	Visual assessment Photographic evidences	From beginning till completion of project	HSE Manager/ Proponent
Vegetation	Cutting of trees	Avoid unnecessary cutting of trees In case of cutting of trees, one plant should be	No of trees cleared or cut Disposal of chopped	All project locations	Visual assessment Photographic evidences	From beginning till operational phase	HSE Manager/ Proponent

		replaced by 6 plants	trees Ensure replantation by 1:6 ratio of same species				
Water	Wastage and misuse of water	Avoid un necessary use of water Prevent leakages	Water supply and use	All project locations	All project locations	From beginning till the end of project	HSE Manager/ Proponent
Construction debris	Formation of heaps Remaining concrete material results in hardening of ground surface	Avoid wastage of concrete material Reuse remaining construction material	Quantity & quality of construction material	All trenching areas	Visual assessment Photographic evidence	Weekly	HSE Manager/ Proponent
Social Environment	Disturbance to routine market and local business activities Conflicts between laborers and local communities	Specify time scale for construction activities Discussion with local people regarding conflicts if any	Maintenance of complaint register	All project locations	Review of complaint register Local consultations	Monthly	HSE Manager/ Proponent
Roads and	Traffic congestion	Diversion routes must	Signs and	Intersections	Observations	Weekly	HSE

networks	Night time visibility of drivers is reduced	be allocated to maintain traffic flow Signs and reflectors must be boarded for driver's visibility	detours are being followed	of diversions	Local residents consultations and log book		Manager/ Proponent
Health and safety	Lack of awareness to general public about safety may lead to accidents Incompetent and untrained workers might cause harm to themselves and others. Construction works may include many risks and hazards that may lead to injuries or even death	Safety symbols and instructions will be boarded at work sites Trained personnel will be appointed for the specific work Appropriate PPEs must be used for technical work	Safety precautions Use of PPEs	On all project sites	Tool box talk Visual assessments Record of PPEs	Daily	HSE Manager/ Proponent
Operational Phase							
Electric	Human health	Increase depth of	EMF Intensity	Residency	Electromagnetic	Biannually	HSE

Magnetic Field (EMF)	impacts such as, neuropsychological disorders or cardiovascular diseases	cables to suppress the EMF levels Appropriate cabling with protective shields to suppress electron flux		units near the corridor and grids	meter		Manager/ Proponent
Transformer oil spillage	Contamination of soil and water bodies	Regular checking of storage tanks and machines	Soil sampling for oil and grease	Grid station	Visual assessment Soil analysis Equipment maintenance record	Bi annually	HSE Manager/ Proponent

CHAPTER # 7
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's Environment management team

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 Diamond Fabrics 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 Diamond Fabrics 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-F with the report.

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;
- Benefits of the project specifically for the local people.

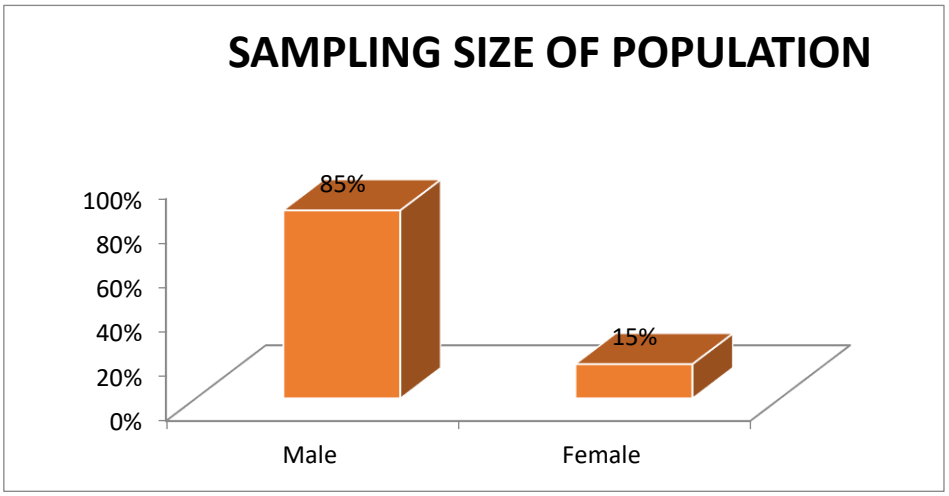
Sample size

Sample size of 20 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.

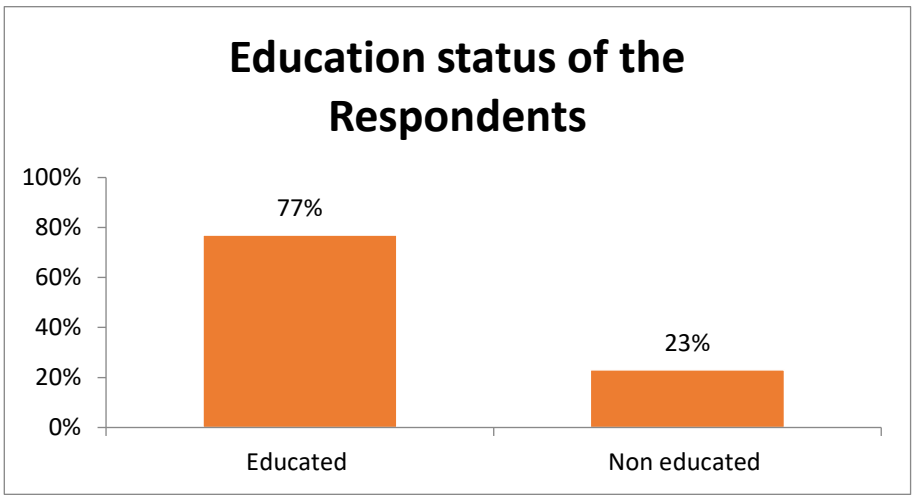
Statistical Analysis

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

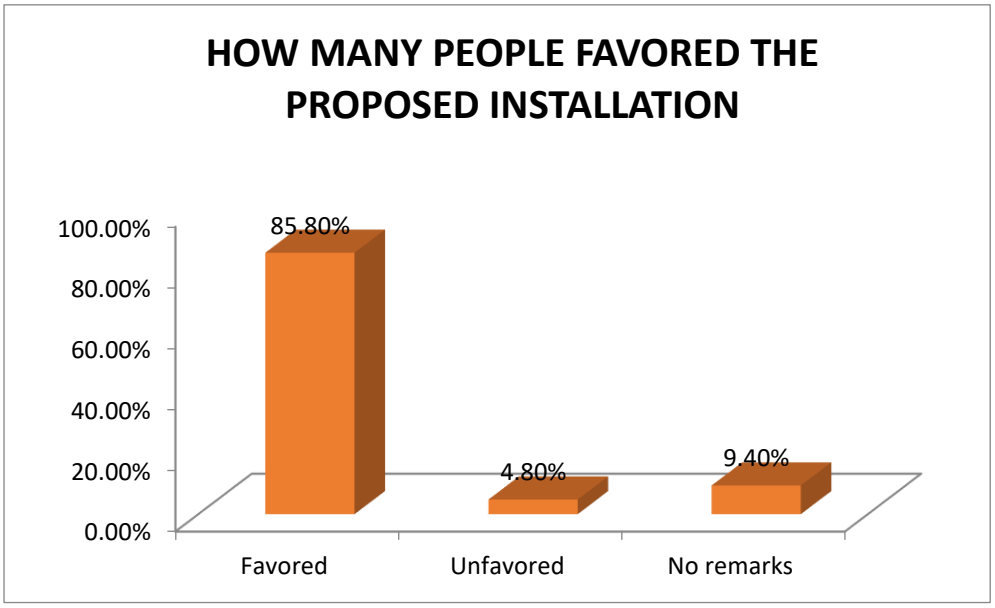
Graphical representation of analysis is given below:



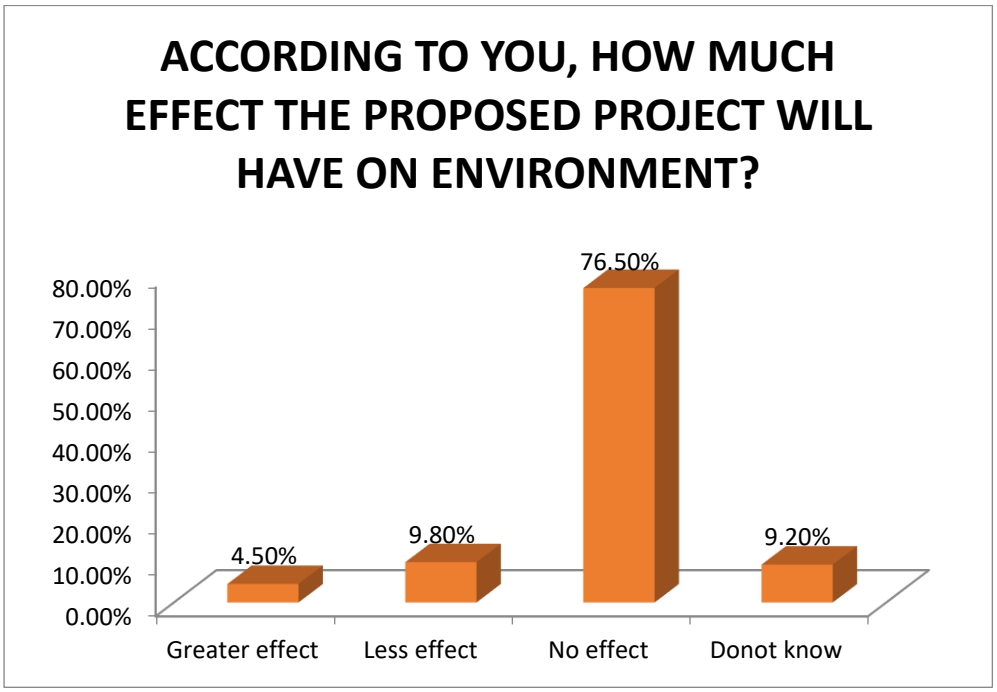
In the sampled population, 85% respondents were male while 15% respondents were female. The number of female respondents is less as compared to male respondents because according to the social binding female hesitates to respond or communicate comfortably.



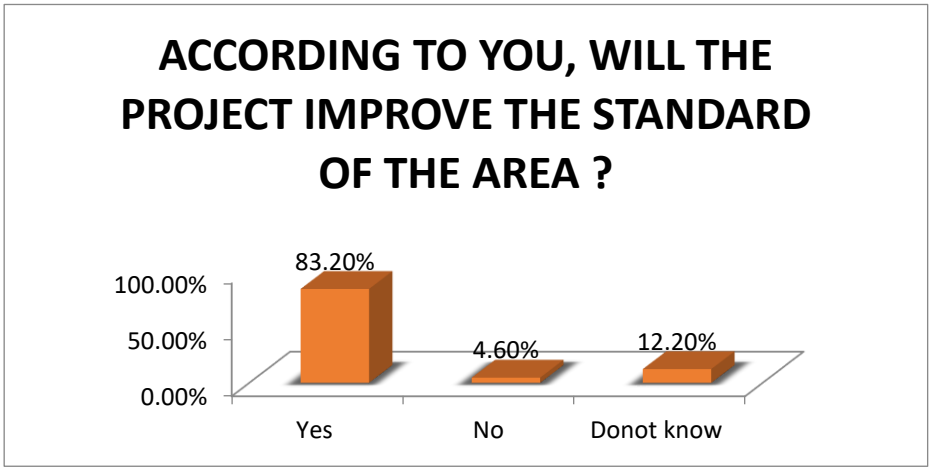
In the sampled population, 77% respondents were educated while 23% were uneducated. Overall education status of the area is good.



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:

- 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.
- Installation of Grid Station 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 # 8
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 of the proposed transmission network project has achieved the following goals:

- Identification of national environmental regulatory requirements that apply to the proposed project activities;
- Identification of the environmental features of the project area including the physical ,biological and social disturbance and likely impact of the project on the environment;
- Recommendation of appropriate mitigation measures that Management of Diamond Fabrics Limited will incorporate and ensure as per this EIA into the project to minimize the adverse environmental impacts.

Baseline physical, biological and socio-economic and cultural data and information was collected from a variety of primary and secondary sources, including field surveys, review of relevant literature and online publications. The collected data was used to organize profiles of the physical, biological and socio-economic environments, likely to be affected by the project. Communities were consulted as per public consultation processes including women, men and institutional stakeholders. The aim of public consultation was to assure the quality, comprehensiveness and effectiveness of the EIA; as well as to ensure that the views and opinions of the local people were adequately taken into account in the decision making process.

Further an Environmental Impact Assessment Report was made to highlight the potential impacts of the described project on the area's physical, biological and socio-economic, gender and cultural environments.

It is concluded that the potential impacts of the proposed project (Grid addition) will be insignificant on most of the environmental receptors, provided that the EMP and its mitigation measures proposed in this report are implemented in true spirit. However, some area will need special care with regards to the disturbance to the community of the area. Management of Diamond Fabrics Limited must be constituted to ensure minimum impacts.

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 Diamond Fabrics 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.