

EXECUTIVE SUMMARY

This executive summary presents an overview of the main findings of the Environmental Impact Assessment Report for establishing fertilizer manufacturing plant under the name of Agricon Services Pakistan of 6.45 Kanals of area, located at Near Imran Rice Mills, Chak Mano, Tehsil Phalia and District Mandi Bahauddin. The main goal of this project is to provide good quality fertilizers to the market.

1. Introduction

The proposed project involved the installation of the fertilizer manufacturing plant for the manufacturing of the organic and quality assured crop stimulators. According to Schedule-II of IEE and EIA Regulations, 2000; the project fall under **Category B (3)** i.e., the project requires an EIA Study. Thus, an EIA Report is being prepared and submitted accordingly for environmental approval.

The estimated project cost is **50 Million PKR.**

2. Project Description

The project comprised of fertilizer manufacturing by granulation, crashing and filtration techniques. The total area of the project 6.45 Kanals and area around the project is fertile and agricultural land. It is located Near Imran Rice Mills, Chak Mano, Tehsil Phalia and District Mandi Bahauddin. Approximately, the production capacity of the factory is 109 metric tons/day. Hence, the EIA of Agricon Services Pakistan is being submitted for environmental approval.

Salient Features of Project

| Sr# | Project Salient Features | |
|-----|--------------------------|---|
| 1 | Project Title | Agricon Services Pakistan |
| 2 | Purpose of Project | <i>Manufacturing of organic based Agro Fertilizers</i> |

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| | | |
|--|-----------------------|---|
| 3 | Site Coordinates | <i>32°26'12.80"N 73°42'37.90"E</i> |
| 4 | Total Area of Project | <i>6.45 Kanals</i> |
| 5 | Cost of the Project | <i>50 Million PKR</i> |
| 6 | Proponent Name | <i>Ghulam Abbas S/O Muhammad Hussain</i> |
| 7 | Consultant Name | <i>Central Environmental Services (Pvt) Ltd.</i> |
| 8 | Tree Planation | <i>At Designated Green Areas</i> |
| 9 | Water Source | <i>Groundwater</i> |
| 10 | Source of Power | <i>MEPCO</i> |
| 11 | Manpower/Staff | <i>10-15 workers</i> |
| <i>*MEPCO=MULTAN ELECTRIC POWER COMPANY</i> | | |

3. Impacts and Recommended Mitigation Measures

In order to identify all the impacts associated with the project during construction and operational activity with potential to cause adverse environmental impacts, a thorough review has been conducted. Although, there is very low chances of any adverse impact occurrence on the surrounding environment. However, in case of impact arises from the project activity possible necessary measures will be adopted to control the same. Overall the project has positive social impacts specifically on the local population and generally contributes in Pakistan's GDP. The project may have some adverse environmental impacts of minor to moderate magnitude which will be controlled through mitigation measures proposed in Environmental Management and Monitoring Plan (EMMP). Moreover, clearing of the vegetation will be done during site clearance but restoration and reclamation will be carried out by the plantation of native species in specified green areas. Environmental impacts have been identified and mitigation measures are recommended within the Project Area of

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Influence; which lies within 1.0 km boundary of the proposed project facilities. The major impacts on physical, biological and social environments are described as under:

Impact Summary

| Environmental Parameters | Impact Assessment during Different Phases | |
|--------------------------------|---|-------------|
| | Construction | Operational |
| A: Physical | | |
| Land Resources | | |
| Soil Erosion and Contamination | -2p | 0 |
| Transportation | -1t | -1t |
| Solid Waste and By-Products | -2t | -2p |
| Land Use | -2p | NA |
| Air Resources | | |
| Noise Pollution | -1t | -1t |
| Air Emission | -1t | -1t |
| Dust | -1t | -1t |
| Odor | NA | -2t |
| Water Resources | | |
| Ground Water | -1p | -1p |

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| | | |
|---|-----|-----|
| Surface Water | NA | NA |
| Wastewater | -1p | -2p |
| B : Ecological | | |
| Flora | | |
| Tree Cutting | -1p | +1p |
| Fauna | | |
| Terrestrial Fauna | -1p | +1p |
| C: Socio-Economic | | |
| Employment Opportunities | +1t | +1p |
| Land Value Appreciation | +1t | +2t |
| D: Hazards | | |
| Biological Hazards | NA | NA |
| Physical Hazards | -1t | -1p |
| Chemical Hazards | 0 | -1p |
| Health and Safety | -1t | -1p |
| <i>Legends: 1= Low; 2= Medium; 3= High; 4= Extremely High; NA= Not Applicable; t= Temporary; p= Permanent; app= Applicable; 0= Negligible</i> | | |

4. Environmental and Social Monitoring Plan

Environmental Management and Monitoring Plan (EMMP) were developed for effective implementation of the recommended mitigation measures. The EMMP includes check and balance to control and minimize the identified impacts and monitoring programs to oversee residual impacts, if any, during the operational phase. The EMMP describes procedures to be followed throughout the construction and operation of the project. It also identifies the roles and responsibilities of all concerned personnel, including the persons reporting during the different project phases. Mitigations for physical, biological and socio-economic parameters will be measured to determine compliance with standards established in EMMP. The Monitoring Plan will record the inputs provided by various participants in the environmental and social management process. It will also check whether the prescribed national and provincial guidelines and plans are being followed and that the required mitigation measures and activities are being accomplished in time.

5. Monitoring Plans

During operational phase, monitoring is required to be carried out at least once in a month during rainy season to check the soil contamination and surface water level/condition. Moreover, periodic monitoring should also be carried out regarding ambient air quality, noise and dust level and worker safety. A detailed site monitoring plan has been developed and given in Chapter-6 of this EIA Report.

6. Conclusion

The findings of EIA Report showed that although the fertilizer manufacturing is expected to have significant minor to moderate negative impacts on the environment during the construction and operational phases but the severity of these adverse impacts can be reduced significantly by adopting EMMP with true spirit as proposed in the Chapter 7 of this EIA Report. The impacts were assessed by frequent site visits, studying related projects and by reviewing the documents. Generally, the project is planned to follow efficient environmental management systems. Specific environmental and social benefits have been mentioned below which depend on the proper application of mitigation measures suggested in EMMP and best engineering practices

7. Recommendations

The intensity and severity of impacts occurred due to the fertilizer processing varies with change in the nature and magnitude of the project as well as depends upon the baseline environmental conditions of the area. The mitigation measures will require constant information flow and consultation with the stakeholders to ensure the least adverse social-economic impact to outweigh the “no project development” scenario.

- ⊙ The adverse environmental impacts can be reduced significantly by adopting best management and monitoring practices as well as by implementation EMMP with true spirit
- ⊙ Proper PPEs including gloves, face masks, head gear etc. will be provided
- ⊙ No compromise on public health and environment should be allowed
- ⊙ Waste minimization practices should be introduced to workers by conducting lectures on spot to aware the workers about the long-term benefits of the same in lieu of surrounding environment
- ⊙ A proper tree plantation plan should also be developed in order to make the process environment friendly
- ⊙ Small domestic waste storage bins should be placed at different locations for proper collection and disposal of the solid waste
- ⊙ It is recommended that the Proponent should obtain an Environmental Approval (NOC) from the Punjab-EPA before proceeding further

Table of Contents

| | | |
|----------|--|-----------|
| 1 | INTRODUCTION | 18 |
| 1.1 | Project Background | 18 |
| 1.2 | Project Nature and Size | 19 |
| 1.3 | Project Location | 20 |
| 1.4 | Regulatory Compliance | 22 |
| 1.5 | The Proponent | 23 |
| 1.6 | Project Importance | 23 |
| 1.7 | Details of Consultant | 24 |
| 1.8 | Purpose of Report | 26 |
| 2 | Screening and Scoping | 27 |
| 2.1 | Screening/Type and Category of Project | 27 |
| 2.2 | Scoping: | 27 |
| 2.3 | Alternatives | 29 |
| 2.3.1 | Site Alternatives | 29 |
| 2.3.2 | Project Alternatives | 30 |
| 3 | PROJECT DESCRIPTION | 31 |
| 3.1 | Objectives of Project | 31 |
| 3.2 | Location and Layout of Project | 31 |
| 3.3 | Land Use on Site | 32 |
| 3.4 | Road Access | 32 |
| 3.5 | Vegetative Features | 33 |
| 3.6 | Project Description | 34 |
| 3.7 | Amenities | 39 |

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| | |
|---|-----------|
| 3.7.1 Electricity | 39 |
| 3.7.2 Ground Water Resource | 39 |
| 3.8 Management Plans | 39 |
| 3.8.1 Air Emissions | 39 |
| 3.8.2 Wastewater Management and Disposal | 39 |
| 3.8.3 Waste Management | 40 |
| 3.9 Staff/Manpower | 40 |
| 3.10 Emergency Preparedness | 41 |
| 3.10.1 Safety Trainings | 41 |
| 3.10.2 Use of Drugs and Narcotics | 42 |
| 3.10.3 Personal Protective Equipment's | 42 |
| 3.11 Cost and Magnitude of Operation | 42 |
| 3.12 Relocation and Rehabilitation Plan | 43 |
| 3.13 Land ownership Documents | 43 |
| 3.14 Schedule of implementation | 43 |
| <i>Preconstruction phase</i> | <i>43</i> |
| <i>Construction phase</i> | <i>44</i> |
| <i>Operational phase</i> | <i>44</i> |
| 3.15 Government Approvals | 44 |
| 4 DESCRIPTION OF THE ENVIRONMENT | 45 |
| 4.1 General | 45 |
| 4.2 Methodology | 45 |
| 4.3 Data Collection | 45 |
| 4.5 Social Survey | 46 |
| 4.6 Review of Legal and Administrative Framework | 46 |

| | |
|--|-----------|
| 4.7 Baseline Conditions | 46 |
| 4.8 PHYSICAL RESOURCES | 47 |
| 4.8.1 Topography, Geology and Soil | 47 |
| 4.8.2 Hydrology | 47 |
| 4.2.3 Seismicity..... | 48 |
| 4.8.4 Geography | 48 |
| 4.8.5 Temperature | 49 |
| 4.8.6 Rainfall | 51 |
| 4.8.7 Wind..... | 52 |
| 4.8.8 Noise Level..... | 53 |
| 4.8.9 Ambient Air Quality..... | 54 |
| 4.9 BIOLOGICAL ENVIRONMENT..... | 54 |
| 4.9.1 Flora | 55 |
| 4.9.2 Fauna | 55 |
| 4.10 SOCIOECONOMIC ASSESSMENT..... | 55 |
| 4.10.1 Demographic Profile..... | 55 |
| 4.10.2 Health Facilities | 56 |
| 4.10.3 Educational Facilities..... | 56 |
| 4.11 SOCIO-ECONOMIC PROFILE OF PROJECT AREA | 56 |
| 4.11.1 Demographic Characteristics of the Population | 56 |
| 4.11.2 Family Size..... | 57 |
| 4.11.3 Age Groups | 57 |
| 4.11.4 Occupation of Respondents..... | 57 |
| 4.11.5 Literacy Rate | 58 |
| 4.11.6 Common Diseases | 58 |
| 4.11.7 Cultural, Religious & Other Structures | 59 |

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CONTACT 0303-4342303

| | | |
|--------------|--|-----------|
| 4.12 | SOCIOECONOMIC SURVEY AND PUBLIC CONSULTATION | 59 |
| 4.12.1 | Methods of Public Consultation | 59 |
| 4.12.2 | Project Response | 59 |
| 5 | <i>PUBLIC CONSULTATION AND INFORMATION DISCLOSURE</i> | 61 |
| 5.1 | General..... | 61 |
| 5.2 | Objectives of Consultation | 62 |
| 5.3 | Identification of Stakeholders..... | 62 |
| 5.3.1 | Direct Stakeholders..... | 63 |
| 5.3.2 | Indirect Stakeholders | 63 |
| 5.4 | Public Disclosure..... | 63 |
| 5.5 | Consultation Process | 64 |
| 5.6 | Participants of Public Offices Contacted | 65 |
| 5.7 | Consultation with Beneficiaries..... | 65 |
| 5.8 | Acceptance Level of the Project | 67 |
| 6 | <i>IMPACT ASSESSMENT METHODOLOGY</i> | 69 |
| 6.1 | Objectives | 69 |
| 6.2 | Methodology | 69 |
| 6.2.1 | Magnitude | 70 |
| 6.2.2 | Immediacy | 70 |
| 6.2.3 | Sustainability and Reversibility..... | 70 |
| 6.3 | Purpose of Mitigation Measure..... | 70 |
| 6.3.1 | What is the problem?..... | 70 |
| 6.3.2 | When problem will occur and when it should be addressed? | 71 |
| 6.3.3 | Where problem should be addressed? | 71 |
| 6.3.4 | How the problem should be addressed? | 71 |

CENTRAL ENVIRONMENTAL SERVICES (PVT) LIMITED

OFFICE NO.11, SF, CENTRE POINT PLAZA, MAIN BOULEVARD, GULBERG, LAHORE

CONTACT 0303-4342303

| | | |
|----------|---|-----------|
| 6.3.5 | Ways of Achieving Mitigation Measures? | 71 |
| 6.3.6 | Changing in Planning Design | 71 |
| 6.3.7 | Improved Management and Monitoring Practices | 72 |
| 6.4 | Impacts Associated with Project Location | 72 |
| 6.5 | Impact Assessment Methodology | 73 |
| 7 | <i>SCREENING OF IMPACTS AND THEIR MITIGATION MEASURE</i> | 75 |
| 7.1 | Impact Evaluation..... | 75 |
| 7.1.1 | Methodology for Impact Evaluation | 75 |
| 7.2 | Impact and Mitigation Management | 81 |
| 7.2.1 | Approaches for Mitigation Measures | 81 |
| 7.3 | Expected Positive Impacts | 82 |
| 7.3.1 | Increase in Employment Opportunities..... | 82 |
| 7.3.2 | Economic Uplift of the Area | 83 |
| 7.3.3 | Raw-Material Availability | 83 |
| 7.3.4 | Enhance Competitiveness of Domestic fertilizers | 83 |
| 7.4 | Adverse Impacts and Mitigation Measures | 83 |
| 7.4.1 | Impacts and Mitigations during Design Phase..... | 84 |
| 7.4.2 | Impacts and Mitigations during Construction Phase | 87 |
| 7.4.3 | Impacts and Mitigations during Operational Phase..... | 91 |
| 7.5 | Potential Environmental Enhancement Measures..... | 96 |
| 8 | <i>ENVIRONMENTAL MANAGEMENT AND MONITORING PLANS</i> | 97 |
| 8.1 | Objectives | 97 |
| 8.2 | Management Approach..... | 98 |
| 8.2.1 | Proponent | 98 |
| 8.2.2 | Contractors | 98 |

CENTRAL ENVIRONMENTAL SERVICES (PVT) LIMITED

OFFICE NO.11, SF, CENTRE POINT PLAZA, MAIN BOULEVARD, GULBERG, LAHORE

CONTACT 0303-4342303

| | | |
|----------|---|------------|
| 8.3 | Components of EMMP | 98 |
| 8.3.1 | Remedial and Mitigation Measures | 99 |
| 8.4 | Environmental Management and Monitoring Framework | 99 |
| 8.4.1 | Institutional Arrangements and Responsibilities..... | 101 |
| 8.4.2 | Impacts Management and Monitoring Plans..... | 105 |
| 8.4.3 | Biodiversity Management and Monitoring Plans..... | 114 |
| 8.4.4 | Decommissioning Plans | 115 |
| 8.5 | Training and Capacity Building..... | 119 |
| 8.6 | Impacts and their Mitigation Summary | 121 |
| 8.7 | Equipment Maintenance Details..... | 123 |
| 8.8 | Environmental Budget | 123 |
| 9 | CONCLUSION AND RECOMMENDATIONS | 124 |
| 9.1 | Merits and Demerits | 124 |
| 9.2 | Recommendations | 125 |

LIST OF TABLES

| | |
|--|------------|
| Table 1: Sensitive receptors | 21 |
| Table 2 Details of Proponent | 23 |
| Table 3: Consultant Details | 24 |
| Table 4: List of Experts | 25 |
| Table 5: Distance of Project Area from Sensitive Receptors | 31 |
| Table 6: Distance of Project Area from Sensitive Receptors | 32 |
| Table 7: Vegetative Features of the Project Area | 33 |
| Table 8: Products manufacturing list | 34 |
| Table 9: Details of the Officers | 41 |
| Table 10: List of People Consulted | 67 |
| Table 11: Impact Screening Checklist..... | 77 |
| Table 12: Impact Evaluation Matrix..... | 79 |
| Table 13: Approaches for Mitigation Measures..... | 82 |
| Table 14: Environmental Management and Monitoring Plan..... | 99 |
| Table 15: Roles and Responsibilities..... | 102 |
| Table 16: Air Quality Management and Monitoring Plan | 105 |
| Table 17: Solid Waste and By-Products Management and Monitoring Plan | 107 |
| Table 18: Wastewater Management and Monitoring Plan | 109 |
| Table 19: Transport Code of Conduct | 111 |
| Table 20: Health and Safety Management and Monitoring Plan.... | 112 |
| Table 21: Biodiversity and Invasive Plants Management and Monitoring Plan | 114 |
| Table 22: Habitat Management Plan | 116 |
| Table 23: Training and Capacity Building Plan | 119 |
| Table 24: Impacts Summary of fertilizer Processing | 121 |

LIST OF FIGURES

| | |
|---|-----------|
| Figure 1: Area of Agricon Services Pakistan | 21 |
| Figure 2: Road Access Plan..... | 33 |
| Figure 3: Production process of Fertilizers | 38 |
| Figure 4: Wastewater Generation and Disposal Mechanism | 40 |
| Figure 5: Fertilizer granulator | 43 |
| Figure 6 Seismic Zoning Map of Pakistan..... | 48 |
| Figure 7: Average Annual Temperatures and precipitation in Mandi Bahauddin | 50 |
| Figure 8: Maximum temperature ranges in Mandi Bahauddin | 51 |
| Figure 9: Annual cloudy, sunny and precipitation days in Mandi Bahauddin . | 51 |
| Figure 10: Annual Precipitation amounts in Mandi Bahauddin | 52 |
| Figure 11: Annual average wind speed in Mandi Bahauddin | 52 |
| Figure 12: Wind Rose diagram of Mandi Bahauddin..... | 53 |
| Figure 13: Consulted age groups in the area near project site..... | 57 |
| Figure 14: Occupation of Respondents | 58 |
| Figure 15: Literacy Rate | 58 |
| Figure 16: Percentage of people in favour or against the project | 60 |
| Figure 15: Hierarchy of Mitigations..... | 73 |

GLOSSARY

Environmental Management System (EMS):

A set of management process and procedure that allows an organization to analyse and reduce the environmental impacts of its activities. Environmental Monitoring Systematic, geo-referenced observations of the environment essential to detecting changes in ecosystems over time. Environmental Protection Plan (EPP) a practical tool that describes the actions required to minimize environmental effects before, during and after project implementation. The plan may include details about the implementation of the mitigation measures identified in the environmental assessment, such as who is responsible for implementation, where the measures are intended to be implemented, and within what timeframe.

Habitat:

Land and water used by wildlife. This may include biotic and Abiotic aspects such as vegetation, exposed bedrock, water, and topography.

Impact:

Any aspect of a project that may cause an effect; for example, land clearing during construction is an impact, while a possible effect is loss and fragmentation of wildlife habitat.

Indirect Effect:

An effect in which the cause-effect relationship (e.g., between the project's impacts and the ultimate effect on a Valued Ecosystem Component) has intermediary effects. As an interaction with another effect is required to have a cumulative effect (hence, creating intermediary effects), cumulative effects may be considered as indirect. Industry Relations Corporation (IRC) The Corporation or organization that a First Nation has created to manage the First Nation's relations, including Consultation with Alberta, Canada and Industry.

Mitigation:

The elimination, reduction or control of the adverse environmental effects of the project. Mitigation includes restitution for any damage to the environment caused by such effects through replacement, restoration, compensation or any other means.

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Non-Renewable Resource:

Natural resources that are in fixed supply such as coal, oil and minerals.

Project:

The activity or group of activities proposed by the Proponent. The types of activities that could be subject to Alberta's environmental assessment process are listed in the Schedule of Activities in the Environmental Protection and Enhancement Act and in the Water Act. The Project includes all associated construction, operation, decommissioning and reclamation activities and all phases of development described by the Proponent. Project Area Project Footprint/Study Area The area includes all lands subject to direct disturbance from the project and associated infrastructure. Project Components The different physical entities and activities that together make up the Project.

Residual Effect:

An effect that remains after mitigation has been applied

Scoping:

An activity that focuses the assessment on relevant issues and concerns and establishes the boundaries of the environmental assessment. A consultative process for identifying and possibly reducing the number of items (e.g., issues, VECs) to be examined until only the most important items remain for detailed assessment. Scoping ensures that assessment effort will not be expended in the examination of trivial effects.

Significance:

A measure of the magnitude, duration, frequency, timing, probability of occurrence, ecological and social context, geographic extent, and degree of reversibility of an effect on a Valued Ecosystem Component

LIST OF ABBREVIATIONS

| | |
|------------------------|---|
| °C | Degree Celsius |
| CO₂ | Carbon dioxide |
| CPEC | China Pakistan Economic Corridor |
| EIA | Environmental Impact Assessment |
| EIA | Initial Environmental Examination |
| EMMP | Environmental Management and Monitoring Plan |
| EMP | Environmental Management Plan |
| EPA | Environmental Protection Agency |
| EPD | Environmental Protection Department |
| GDP | Gross Domestic Product |
| m³ | Cubic meter |
| m³/h | Cubic meter per hour |
| MW | Megawatt |
| NEQS | National Environmental Quality Standards |
| No. | Number |
| NOC | No Objection Certificate |
| NO_x | Oxides of Nitrogen |
| PEPA, 2012 | Punjab Environmental Protection (Amendment) Act, 2012 |
| PEPC | Pakistan Environmental Protection Council |
| PEPO | Pakistan Environmental Protection Ordinance |
| PKR | Pakistani Rupees |
| PM | Particulate Matter |
| PPEs | Personal Protective Equipment |
| QA | Quality Assurance |
| RO | Reverse Osmosis |
| SOPs | Standard Operation Procedures |
| SEAL | Solution Environmental & Analytical Laboratory |

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1 INTRODUCTION

1.1 Project Background

Pakistan being an agro based country has always been in need for the fertilizers and it provided a ground for new capital investment and growth. The fertilizer industry of Pakistan has enormous potential and is well on its way to becoming one of the biggest fertilizer exporters in the region in the coming years.

Being primarily an agrarian state, Pakistan's growth is heavily dependent on the fertilizer industry. According to reports, Pakistan's fertilizer demand has always remained higher than its supply. However, with the advancement of technology and increased number of players in the industry, production capacity has increased to approx. 9 million tons per year, which has consistently surpassed the national demand over the last few years.

Furthermore, the consumption of fertilizer has increased manifold due to heightened awareness among farmers that its usage in good quantity is fruitful for higher yields and a significant increase in their income as the commodity is provided subsidized rates.

The proposed project for which impact assessment study is being carried out is entitled as Agricon Services Pakistan is proposed to be established Near Imran Rice Mills, Chak Mano, Tehsil Phalia and District Mandi Bahauddin. The proponent of the proposed project is expected to provide high quality of fertilizer to fulfill the development requirement of the country.

The development of any project leads to positive and negative changes in environment and social set up around the project area. The intensity and level of change, however, depends upon the nature of the project and the baseline environmental conditions of the area. The commencement of proposed project will cause minor to moderate adverse environmental and social impacts on the surrounding area. Thus, an environmental and social impact assessment study is mandatory to establish the baseline conditions, evaluate the possible adverse impacts if any, and devise the mitigation measures accordingly.

1.2 Project Nature and Size

The proposed project will involve the manufacturing of the quality Chemical products. The products are under the following Product names along with the composition.

| Sr# | Product Name | Specification | Project Capacity (Per/Day) |
|-----|-------------------|--|-------------------------------|
| 1. | Sunda Zinc | Zn 21% Solid | 5 metric ton/day |
| 2. | Zat Power+ | Zn 33% Solid | 5 metric ton/day |
| 3. | Zat Wrestler | Humic Acid 40% , K2O=7% (Solid Granules) | 8 metric ton/day |
| 4. | Zat Wrestler Plus | Humic Acid 10 % Liquid | 10 metric ton/day |
| 5. | Zatron | Boron=B=5% Liquid | 4 metric ton/day |
| 6. | Zat Zinc | Zinc 10% Liquid | 10 metric ton/day |
| 7. | Zatilizer | N:P:K 8:8:6 Liquid | 5 metric ton/day |
| 8. | Zat Power Plus | Zinc 27% Monohydrate | 6 metric ton/day |
| 9. | Zatco | Zn=3%, Fe=2%, Mn=2%, Cu=2% Liquid | 3 metric ton/day |
| 10. | Zadaan | Cartap Hydrochloride...40g/kg (4%W/W) | 3 metric ton/day |
| 11. | Claver | Monomehypo....50g/kg (5% W/W) | 5 metric ton/day |
| 12. | Emamectin | Emamectin Benzoate....19g/kg (2.1% W/W) | 5 metric ton/day |

| | | | |
|-----|--------------|---|------------------|
| 13. | Armite | Acetochlor 500 gm/ltr (49% W/W) | 5 metric ton/day |
| 14. | Chlorpyrifos | Chloropyrifos....400g/ltr (38.50 W/W) | 5 metric ton/day |
| 15. | Paraquat | Paraquat.....200g/ltr (18.2% W/W) | 5 metric ton/day |
| 16. | Glyphosate | Glyphosate.....480g/ltr (41% W/W) | 5 metric ton/day |
| 17. | Butachlor | Butachlor....600 g/ltr (59% W/W) | 5 metric ton/day |
| 18. | Atrazine | Atrazine.....380g/ltr (34.8 W/W) | 5 metric ton/day |
| 19. | Sega Pest | Emamectin Benzoate..10g/l (0.95% W/W) Lufenuron 20g/l (1.90 W/W) | 5 metric ton/day |
| 20. | Horn | Imidacloprid....700g/kg(25 wp) | 5 metric ton/day |
| 21. | Guldasta | Zn=7%, Fe=2%, Cu=1% | |

*The estimated project cost is **50 Million PKR**

1.3 Project Location

The proposed location for the installation of proposed project of **Agricon Services Pakistan** is Near Imran Rice Mills, Chak Mano, Tehsil Phalia and District Mandi Bahauddin. The geographical location of the proposed area is *32°26'12.80"N 73°42'37.90"E*.

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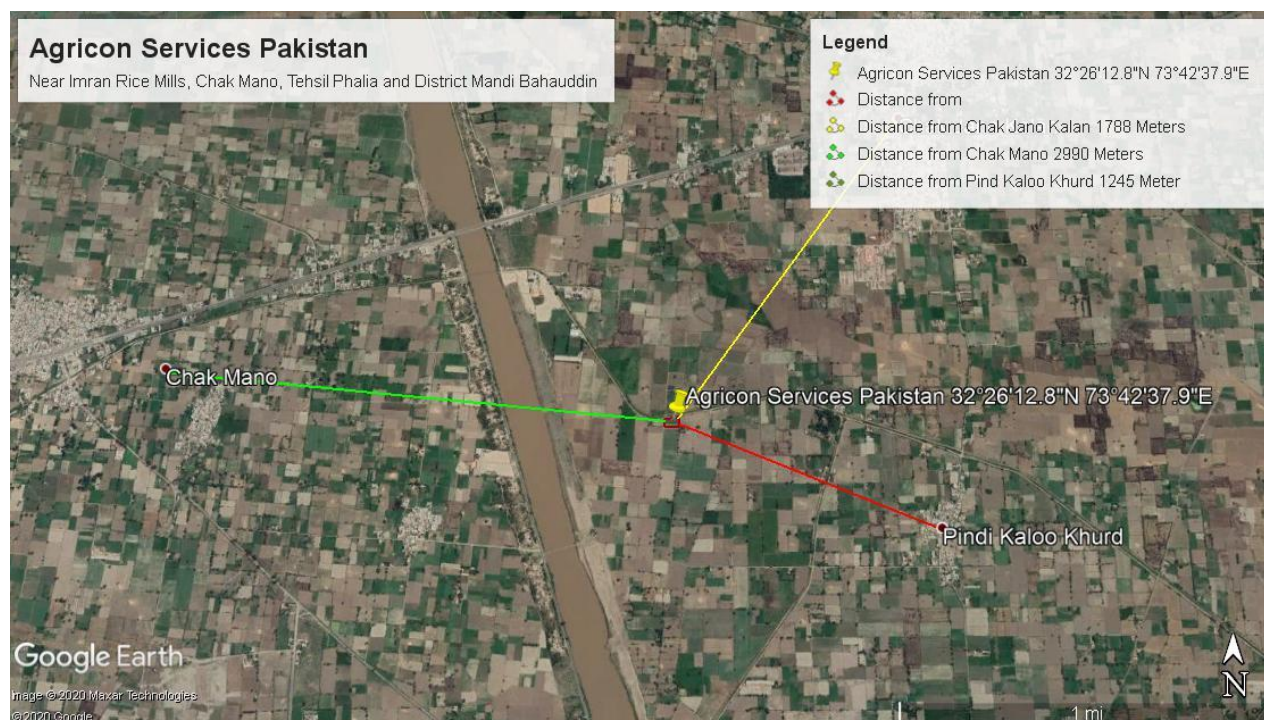


Figure 1: Area of Agricon Services Pakistan

The nearest population is Kaloo Khurd present near the project area is at the distance of 1245m

Environmental sensitivity of the project includes the distance between the project area periphery from ecologically important features and socially significant infrastructures present in the study area. No ecology sensitive receptor such as; forest or reserved area is present within 10 km vicinity that could be impacted due to the installation and operation of the proposed project.

There are no particular sensitive areas as project is located far from populated areas. The details are given below in table 2:

Table 1: Sensitive receptors

| Residential Areas (Aerial Distance) | | |
|-------------------------------------|-------------|------------|
| 1 | Kaloo Khurd | 595 meters |

| | | |
|-----------------|---------------------|-------------|
| 2 | Chak Jano Kalan | 1788 meters |
| 3 | Chak Mano | 2990 meters |
| Hospital | | |
| 1 | THQ Phalia | 5 KM |
| 2 | Rural Health Centre | 2 KM |

1.4 Regulatory Compliance

As per IEE/EIA Regulations 2000, it is mandatory for the proponent of any development project to obtain Environmental Approval (NOC) from EPA by filing an IEE or EIA as the case may be. The said project is proposed by the proponent to meet the ever-increasing demand of raw material for the development projects. For this purpose, the proponent has decided to engage environmental consultants, **M/S Central Environmental Services (Pvt.) limited** to prepare EIA Report. The purpose of this study is to identify the environmental and social baseline of the project and study area i.e., physical, biological, socio-economic, cultural changes and to assess all possible impacts anticipated during the installation and operation phases of the proposed project with the aim to find out appropriate mitigation measures to either eliminate those impacts or to bring them to acceptable level as well as to formulate Environmental Management and Monitoring Plan (EMMP) for implementation in sustainable manner. This EIA Report provides relevant information as required under the officially approved format, to help the decision makers i.e., EPA Punjab before issuing for the Environmental Approval.

Following rules, regulations and acts are considered for the commencement of the proposed project:

- ⇒ Punjab Environmental Protection Act, 1997 (Amended 2012)
- ⇒ Punjab Environmental Quality Standards (PEQS)

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- ⇒ Self-Monitoring and Reporting Rules (SMART)
- ⇒ Punjab Fertilizer Act 2018
- ⇒ Environmental, Health and Safety Guidelines

1.5 The Proponent

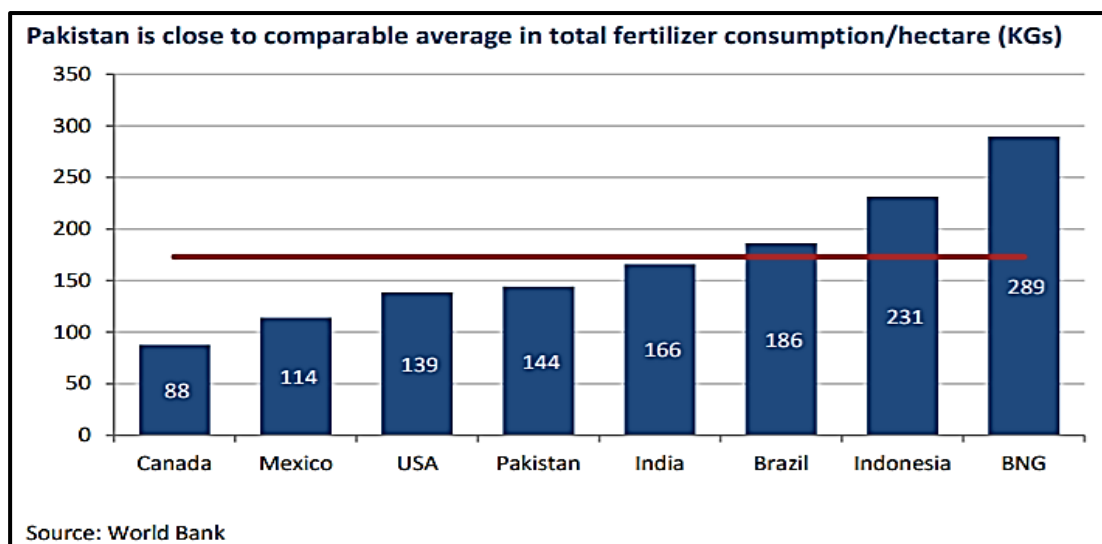
The details of the proponent of the proposed project are given below:

Table 2 Details of Proponent

| | | |
|---|----------------|---|
| 1 | Name | Ghulam Abbas S/O Muhammad Hussain |
| 2 | Company | Agricon Services Pakistan |
| 3 | Address | Near Imran Rice Mills, Chak Mano, Tehsil Phalia and District Mandi Bahauddin. |

1.6 Project Importance

The fertilizer industry is an integral part of Pakistan's economy. The Pakistani fertilizer industry produces, imports and distributes various types of fertilizers. With agriculture continuing to be the mainstay of the Pakistan economy, the need to improve crop productivity and quality has assumed significant proportions over the year. To that end, the government has pursued a policy of supporting the industry in the form of feed gas subsidies and increasing support prices for commodities (which increase farmer's purchasing power for fertilizers). Over the years, fertilizer manufacturers have responded timely to farmer demands and, in the process, reaped handsome profits. This is not extraordinary considering the fertilizer, by itself contributes nearly 25-75% in raising yields, depending on the crop and soil type. Better marketing, product development and prudent management have led to good return on equities for the local fertilizer players. Nonetheless, the demand for fertilizers is going to increase in future.



1.7 Details of Consultant

The proponent of the **Agricon Services Pakistan** has engaged **Central Environmental Services (Pvt.) Limited** to carry out the EIA Study for the installation and operation of aforesaid project in accordance with Punjab-EPA guidelines. For this purpose, the company engaged the group of professionals which comprises of environmental specialists and social scientists. The details of the consultant are given below:

Table 3: Consultant Details

| Sr# | Consultant Details | |
|--------------|--------------------|---|
| 1 | Consultant | <i>Central Environmental Services (Pvt) Ltd.</i> |
| 2 | Address | Office no.11 (2 nd floor) Centre point Plaza, Main Boulevard Lahore. |
| 3 | Contact No. | 0303-4342302 |
| Focal Person | | |
| 4 | Name | Kamal Ahmed Cheema |

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To prepare EIA Report of the respective project the company engaged the following experts. The details of the experts are given below:

Table 4: List of Experts

| <i>Name of expert</i> | <i>Position held</i> | <i>Highest Qualification</i> |
|------------------------------|-----------------------------|--|
| Dr. Mateen Shafqat | Chief Advisor | PhD Environmental Sciences, PMAS, Arid Agriculture University |
| Kamal Ahmed Cheema | Chief Environmentalist | M. Phil. Environmental Economics, PIDE, Islamabad |
| Mr. Shahzaib Ahmed | Social Scientist | M. Phil Development Studies, PIDE, Islamabad. |
| Arslan Iqbal | Environmentalist | M. Phil Environment Sciences, The University of Lahore BS Environmental Sciences The University of Lahore |
| Jawad Shafiq | Environmentalist | BS Environmental Sciences University of Gujrat |
| Naveed Ahmad | Environmentalist | MS Environmental Sciences ARID University, Islamabad |

| | | |
|--------------------|---------------|---|
| Rahma Butt | Environmental | MS Environmental Sciences UET, Lahore |
| Amna Hafeez | Environmental | M.Sc. Mountain Conservation and Watershed Management, University of the Punjab, Lahore |

1.8 Purpose of Report

The main objectives of this EIA Study were:

- ⊙ To determine and record the state of the environment of the project area to establish a baseline in order to assess the suitability of the project in that proposed area
- ⊙ To identify pre-construction/design, construction and operation activities and to assess their impacts on environment
- ⊙ Provide assistance to the proponent for planning, designing and implementing the project in a way that would eliminate or minimize the negative impact on the biophysical and socio-economic environment and maximizing the benefits to all parties in the cost-effective manner
- ⊙ To present mitigation and monitoring plan for smooth implementation of the suggested mitigation measures and supervise their efficiency and effectiveness
- ⊙ To provide opportunity to the public for understanding the project and its impacts on the community and their environment in the context of sustainable development
- Prepare an EIA Report for submission to the EPA, Punjab for Environmental Approval (NOC)

2 *Screening and Scoping*

2.1 Screening/Type and Category of Project

Section 12 of Punjab Environmental Protection Act, 1997 (amended 2012) states "No proponent of a project shall commence construction or operation unless he has filed with the Government Agency designated by Federal Environmental Protection Agency or Provincial Environmental Protection Agencies, as the case may be, or, where the project is likely to cause an adverse environmental effects an Environmental Impact Assessment (EIA), and has obtained from the Government Agency approval in respect thereof." Punjab Environmental Protection Act provided the guidelines for categorizing the projects. According to Schedule-II of IEE and EIA Regulations, 2000; the proposed project falls under **Category B (3)** i.e., the project requires an EIA Study. Thus, an EIA Report is being prepared and submitted accordingly for approval.

The proposed project is the manufacturing of fertilizers under 13 different Product products.

2.2 Scoping:

1. Spatial and Temporal Boundaries of Environmental Assessment:

Temporal and spatial boundaries for the effects assessment are defined by the characteristics of the project and the VECC being assessed. These boundaries encompass time periods and areas during and within which the VECCs are likely to interact with or be influenced by the project.

⇒ Temporal Extent (during construction and operation)

⇒ Spatial Extent (local or widespread)





2. Views, Concerns and Suggestions of Various Stakeholders

Community showed a lot of concerns; a few are being mentioned here:

- ☐ Removal of shrubs and trees should be avoided to the extent possible

- ☐ The project will become the source of income for local to earn their livelihood easily and honorably
- ☐ The area will become further industrialized
- ☐ For the solid waste management and waste disposal, proper disposal techniques should be adopted
- ☐ Employment opportunities will be generated, and locals should be hired on the priority basis
- ☐ The air pollution is one of the major impacts of the proposed project so ambient air quality should be monitored regularly
- ☐ Water spraying/sprinkling should be done on the regular basis during construction phase to avoid dust emissions
- ☐ Removal of shrubs and trees should be avoided to the extent possible
- ☐ Good relations with the local communities will be promoted by encouraging Contractor to provide opportunities for skilled and unskilled employment to the locals as well as on-job training
- ☐ The contractor should prefer hiring local labor from adjacent nearby villages
- ☐ Indigenous tress around the facility should be planted to control air pollution and as the compensation
- ☐ Noise reducing barriers should be installed to reduce noise pollution as the nearest community lies within the radius of 0.8 km

Concerns

-  Workers should be hired from local community
-  Proper disposal of solid waste should be practiced
-  The provision of fertilizer should be at economical rates for poor farmers
-  Indigenous tress around the facility should be planted to control air pollution

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- ✚ Removal of shrubs and bushes should be avoided to the extent possible

3. Significant impacts and factors to be determined

The proposed project is of manufacturing of Crops fertilizers which are organic in nature. The nature of the land is open land having native vegetation such as Neem, Kikar, Safeda and wild grass. The study area is fertile, leveled and agricultural land. In addition, to the noise and fugitive dust emissions during the development phase solid waste management and disposal issues may arise along with wastewater disposal issues. There are few minor impacts associated with the operation of manufacturing unit includes the management of the municipal solid waste generated during the, raw-material storage which will be managed according to local practices of area.

The impacts from the establishment of Agricon Services Pakistan will occur during the construction and operation due to the civil work involved and the people residing in the project area. These issues included; noise generation, fugitive dust emissions, solid waste management, wastewater disposal, top-soil removal, Health and Safety issues and change in the geographic features of the area. These all problems should be addressed on-site where they are being generated, to avoid the residual or adverse impacts.

2.3 Alternatives

The details of the site alternatives and technology alternatives are discussed below:

2.3.1 Site Alternatives

No other site alternative was available to be considered as feasible option for the installation of the plant as the land is owned by the proponent. The proposed site was selected because of the following reasons;

- The site is at the distance of 1245 meters from the nearest residential area is Kaloo Khurd.
- No surface water body is located within the 10 km.
- The site is well connected to the other parts of the country through main G.T. Road.
- No human settlements displacement or relocation associated with the project development and operation

- Operation of the fertilizer processing unit in the respective zone will provide job opportunities to local people and will improve their socio-economic status of the study area as 15-20 employees will be hired during the operational phase
- Operation of the fertilizer processing unit in the respective zone will provide job opportunities to local people and will improve their socio-economic status of the study area as 10 employees will be hired during the operational phase

2.3.2 Project Alternatives.

The alternative of the proposed project is the import of fertilizers from China and other countries. Fertilizer industry is considered as one of the important sector of the agricultural country. A large portion of the revenue is generated from the agricultural sector. So, the installation of the fertilizer industry will help in boosting the crop production industry. The agriculture sector is the backbone of Pakistan's economy. It accounts for approximately 10% of the GDP (excluding livestock) and provides employment to almost 45% of the country's total work force.

Environmental Alternatives:

No important religious, archaeological, recreational site or ecologically/declared protected area and human settlement exists within proximity of the selected site i.e., within 5 Km which is a safe distance. In view of these facts, it can be concluded that the selected site is best suited for the project and will not pose any adverse impact or threat on any component of the environment.

Economic Alternatives:

Agriculture and agro-based products are the largest source of foreign exchange earnings for the country. In the light of above facts, there is a need to encourage local products of fertilizers, which are also economical to poor farmers.

3 PROJECT DESCRIPTION

This section of the study concentrates on details of the project and its salient features; such as its location, site layout, objectives, selection of alternative sites and technology, cost and magnitude of operation at various phases and process employed for the processing of the organic fertilizer.

3.1 Objectives of Project

The overall aim of the project is to enhance the production of fertilizers for the consumption at the local farmer's level for the development in agriculture sector.

3.2 Location and Layout of Project

The proposed location for the installation of proposed project of Agricon Services Pakistan is located Near Imran Rice Mills, Chak Mano, Tehsil Phalia and District Mandi Bahauddin. The geographical location of the proposed area is $32^{\circ}26'12.80''N$ $73^{\circ}42'37.90''E$.

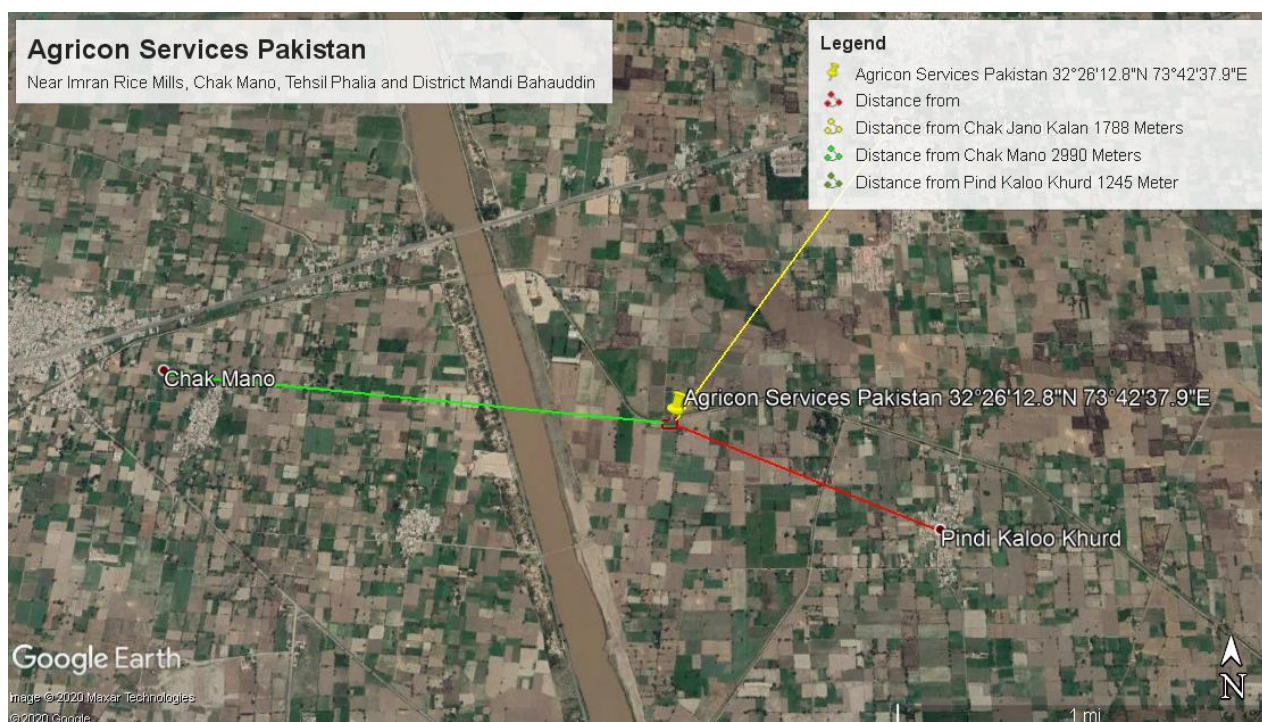


Table 5: Distance of Project Area from Sensitive Receptors

The nearest town Kaloo Khurd is present near the project area is at the distance of 1245 meters, the details of the sensitive receptors near the project area are given below

Table 6: Distance of Project Area from Sensitive Receptors

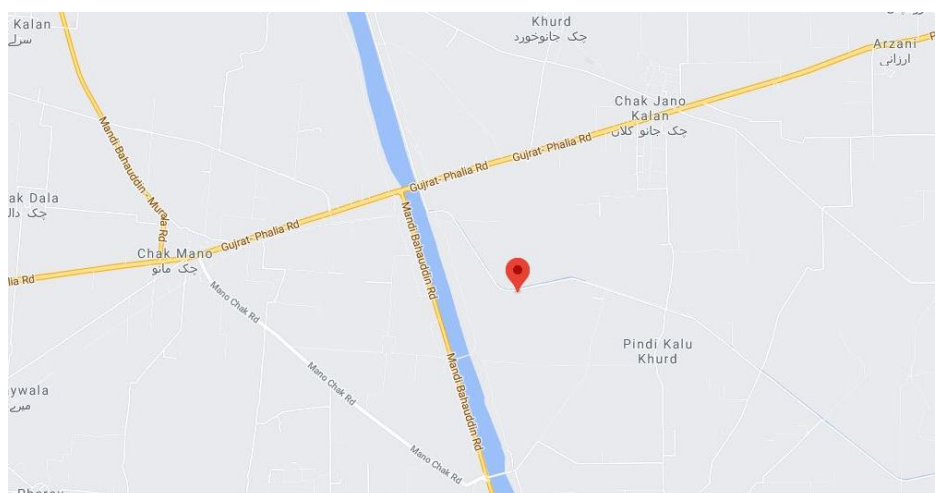
| Residential Areas (Aerial Distance) | | |
|-------------------------------------|---------------------|-------------|
| 1 | Kaloo Khurd | 595 meters |
| 2 | Chak Jano Kalan | 1788 meters |
| 3 | Chak Mano | 2990 meters |
| Hospital | | |
| 1 | THQ Phalia | 5 KM |
| 2 | Rural Health Centre | 2 KM |

3.3 Land Use on Site

The proposed project is an open land. No ecology sensitive receptor such as; forest or reserved area is present within **10 km** vicinity that could be impacted due to the installation and operation of the fertilizer manufacturing unit.

3.4 Road Access

The project site is linked to main Gujrat-Phalia Road.



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Figure 2: Road Access Plan

3.5 Vegetative Features

The area around the project area is agricultural cum industrial. The main crops grown around the project area includes; rice, cotton and maize whereas, the vegetative features of the area include; safeda, bari, neem and kikar.

Table 7: Vegetative Features of the Project Area

| Sr.# | Local Name | Type | Biological Name |
|------|--------------|----------------------|---------------------------|
| 1 | Kikar | <i>Throne Tree</i> | <i>Prosopis juliflora</i> |
| 2 | Safeda | <i>Tree</i> | <i>Eucalyptus</i> |
| 3 | Sheesham | <i>Tree</i> | <i>Dalbergia sissoo</i> |
| 4 | Peepal | <i>Tropical Tree</i> | <i>Ficus religiosa</i> |
| 5 | Wild Grasses | <i>Grass</i> | -- |

3.6 Project Description

The project includes the manufacturing of fertilizer products with organic nature. The products manufacturing list and detailed processing is given below.

Table 8: Products manufacturing list

| Sr# | Product Name | Specification | Project Capacity (Per/Day) |
|-----|-------------------|--|-------------------------------|
| ➤ | Sunda Zinc | Zn 21% Solid | 5 metric ton/day |
| ➤ | Zat Power+ | Zn 33% Solid | 5 metric ton/day |
| ➤ | Zat Wrestler | Humic Acid 40%, K ₂ O=7% (Solid Granules) | 8 metric ton/day |
| ➤ | Zat Wrestler Plus | Humic Acid 10 % Liquid | 10 metric ton/day |
| ➤ | Zatron | Boron=B=5% Liquid | 4 metric ton/day |
| ➤ | Zat Zinc | Zinc 10% Liquid | 10 metric ton/day |
| ➤ | Zatilizer | N:P:K 8:8:6 Liquid | 5 metric ton/day |
| ➤ | Zat Power Plus | Zinc 27% Monohydrate | 6 metric ton/day |
| ➤ | Zatco | Zn=3%, Fe=2%, Mn=2%, Cu=2% Liquid | 3 metric ton/day |
| ➤ | Zadaan | Cartap Hydrochloride...40g/kg (4%W/W) | 3 metric ton/day |
| ➤ | Claver | Monomehypo....50g/kg (5% W/W) | 5 metric ton/day |

| | | | |
|---|--------------|--|------------------|
| ➤ | Emamectin | Emamectin Benzoate....19g/kg (2.1% W/W) | 5 metric ton/day |
| ➤ | Armite | Acetochlor 500 gm/ltr (49% W/W) | 5 metric ton/day |
| ➤ | Chlorpyrifos | Chloropyrifos....400g/ltr (38.50 W/W) | 5 metric ton/day |
| ➤ | Paraquat | Paraquat.....200g/ltr (18.2% W/W) | 5 metric ton/day |
| ➤ | Glyphosate | Glyphosate.....480g/ltr (41% W/W) | 5 metric ton/day |
| ➤ | Butachlor | Butachlor....600 g/ltr (59% W/W) | 5 metric ton/day |
| ➤ | Atrazine | Atrazine.....380g/ltr (34.8 W/W) | 5 metric ton/day |
| ➤ | Sega Pest | Emamectin Benzoate.10g/l (0.95% W/W) Lufenuron 20g/l (1.90 W/W) | 5 metric ton/day |
| ➤ | Horn | Imidacloprid....700g/kg(25 wp) | 5 metric ton/day |
| ➤ | Guldasta | Zn=7%, Fe=2%, Cu=1% | |

Raw Materials:

The fertilizers outlined here are compound fertilizers composed of primary fertilizers and secondary nutrients. The raw materials, in solid form, can be supplied to fertilizer manufacturers in bulk quantities of thousands of tons, drum quantities, or in metal drums and bag containers.

Primary fertilizers include substances derived from nitrogen, phosphorus, and potassium. Various raw materials are used to produce these compounds. When ammonia is used as the nitrogen source in a fertilizer, one method of synthetic production requires the use of natural gas and air. The phosphorus component is made using sulfur, coal, and phosphate rock. The potassium source comes from potassium chloride, a primary component of potash.

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Secondary nutrients are added to some fertilizers to help make them more effective. Calcium is obtained from limestone, which contains calcium carbonate, calcium sulphate, and calcium magnesium carbonate. The magnesium source in fertilizers is derived from dolomite. Sulfur is another material that is mined and added to fertilizers. Other mined materials include iron from ferrous sulfate, copper, and molybdenum from molybdenum oxide.

Manufacturing Process:

a. Nitrogen fertilizer component

Ammonia is one nitrogen fertilizer component that can be synthesized from in-expensive raw materials. Since nitrogen makes up a significant portion of the earth's atmosphere, a process was developed to produce ammonia from air. In this process, Fertilizer natural gas and steam are pumped into a large vessel. Next, air is pumped into the system, and oxygen is removed by the burning of natural gas and steam. This leaves primarily nitrogen, hydrogen, and carbon dioxide. The carbon dioxide is removed and ammonia is produced by introducing an electric current into the system. Catalysts such as magnetite (Fe_3O_4) have been used to improve the speed and efficiency of ammonia synthesis. Any impurities are removed from the ammonia, and it is stored in tanks until it is further processed.

While ammonia itself is sometimes used as a fertilizer, it is often converted to other substances for ease of handling. Nitric acid is produced by first mixing ammonia and air in a tank. In the presence of a catalyst, a reaction occurs which converts the ammonia to nitric oxide. The nitric oxide is further reacted in the presence of water to produce nitric acid.

Nitric acid and ammonia are used to make ammonium nitrate. This material is a good fertilizer component because it has a high concentration of nitrogen. The two materials are mixed together in a tank and a neutralization reaction occurs, producing ammonium nitrate. This material can then be stored until it is ready to be granulated and blended with the other fertilizer components.

b. Phosphorous fertilizer component:

To isolate phosphorus from phosphate rock, it is treated with sulfuric acid, producing phosphoric acid. Some of this material is reacted further with sulfuric acid and nitric acid to produce a triple superphosphate, an excellent source of phosphorous in solid form.

Some of the phosphoric acid is also reacted with ammonia in a separate tank. This reaction results in ammonium phosphate, another good primary fertilizer.

c. Potassium fertilizer component:

Potassium chloride is typically supplied to fertilizer manufacturers in bulk. The manufacturer converts it into a more usable form by granulating it. This makes it easier to mix with other fertilizer components in the next step.

d. Granulating and blending:

To produce fertilizer in the most usable form, each of the different compounds, ammonium nitrate, potassium chloride, ammonium phosphate, and triple superphosphate are granulated and blended together. One method of granulation involves putting the solid materials into a rotating drum which has an inclined axis. As the drum rotates, pieces of the solid fertilizer take on small spherical shapes. They are passed through a screen that separates out adequately sized particles. A coating of inert dust is then applied to the particles, keeping each one discrete and inhibiting moisture retention. Finally, the particles are dried, completing the granulation process.

The different types of particles are blended together in appropriate proportions to produce a composite fertilizer. The blending is done in a large mixing drum that rotates a specific number of turns to produce the best mixture possible. After mixing, the fertilizer is emptied onto a conveyor belt, which transports it to the bagging machine.

e. Bagging:

Fertilizers are typically supplied to farmers in large bags. To fill these bags the fertilizer is first delivered into a large hopper. An appropriate amount is released from the hopper into a bag that is held open by a clamping device. The bag is on a vibrating surface, which allows better packing. When filling is complete, the bag is transported upright to a machine that

seals it closed. The bag is then conveyed to a palletizer, which stacks multiple bags, readying them for shipment to distributors and eventually to farmers.

f. Quality Control:

To ensure the quality of the fertilizer that is produced, manufacturers monitor the product at each stage of production. The raw materials and the finished products are all subjected to a battery of physical and chemical tests to show that they meet the specifications previously developed. Some of the characteristics that are tested include pH, appearance, density, and melting point. Since fertilizer production is governmentally regulated, composition analysis tests are run on samples to determine total nitrogen content, phosphate content, and other elements affecting the chemical composition. Various other tests are also performed, depending on the specific nature of the fertilizer composition.

g. By-products/Waste:

A relatively small amount of the nitrogen and nitrates contained in fertilizers. Nitrosamines are another potential byproduct of the nitrates in fertilizer.

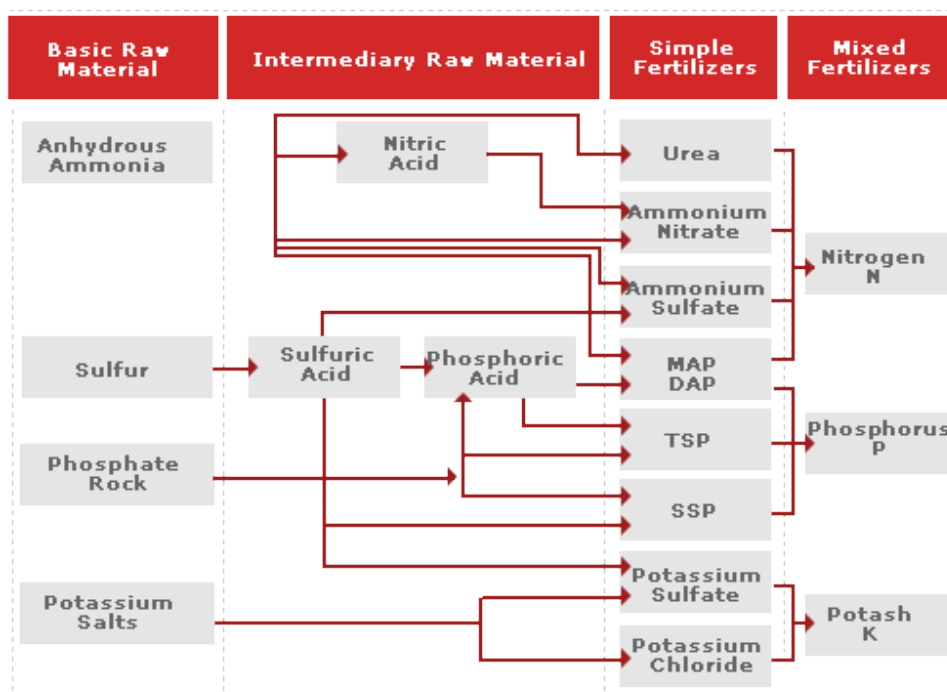


Figure 3: Production process of Fertilizers

3.7 Amenities

The following social amenities are present at site and the management of the waste (solid waste and effluents) is explained in sub-sections below:

3.7.1 Electricity

Electricity will be purchased from MEPCO.

3.7.2 Ground Water Resource

During operational phase ground water will be consumed. The water will be pumped from ground from the depth of 250ft. will be loss as the result of evaporation and 5m³/day will be used for the municipal consumption.

3.8 Management Plans

Following management plans will be employed to reduce the impact of the proposed activity

3.8.1 Air Emissions

Particulate dust will be generated during construction phase there will be no air pollutants emissions during the operational phase. For safety purpose the workers dealing with the process activities will be provided with masks, safety shoes and all other necessary PPEs. To reduce the public nuisance native trees will be planted on the boundary to reduce the nuisance and to reclaim the disturbed soil effectively.

3.8.2 Wastewater Management and Disposal

In the proposed project the wastewater will be generated from process as well as municipal activities. The wastewater from the processing of chemicals will be reused on site during the production of bio stimulant liquid and other products also. The municipal amount of the wastewater generated will be 200 liters (0.2m³) by the sanitation activities if per person wastewater generation is 20 liters and the manpower is 10 (20*10). This wastewater will be discharged in settling tank and ultimately in the drain. Water balance at site will be:

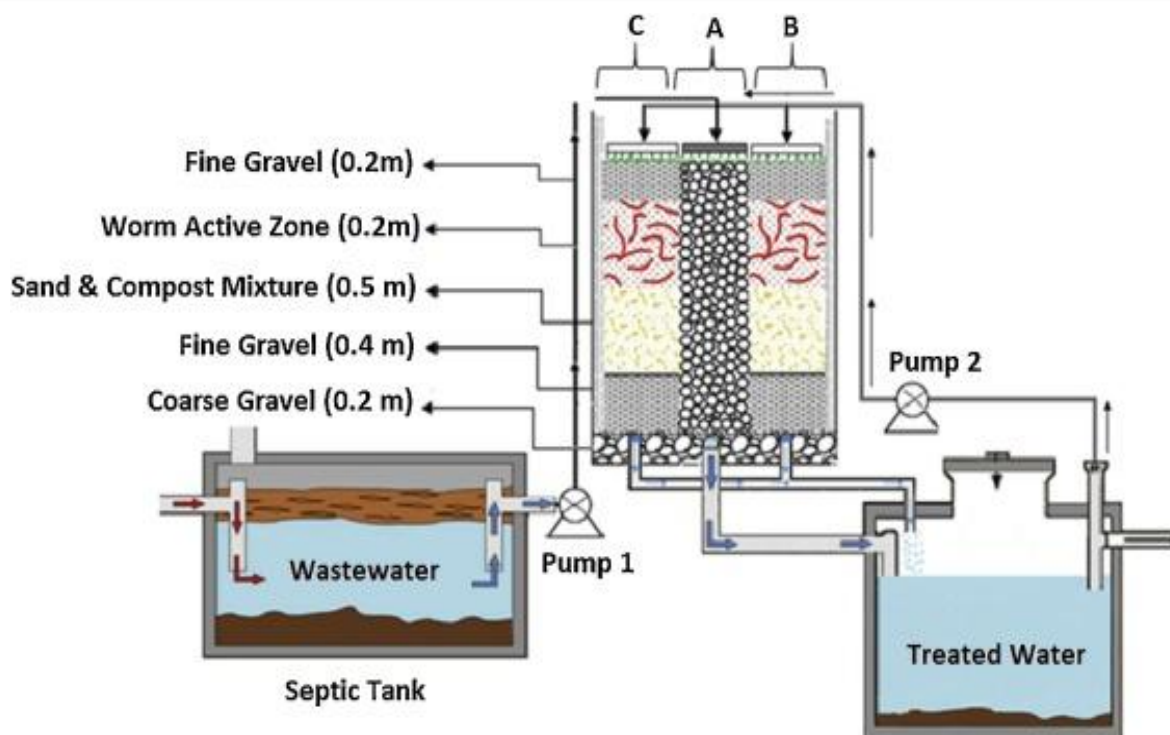


Figure 4: Wastewater Generation and Disposal Mechanism

It is proposed that tree plantation will also be carried out. The generated wastewater will be consumed for on-site horticultural activities after primary treatment.

3.8.3 Waste Management

The solid waste will be generated during the workers mess and other domestic activities. The amount of the solid waste generated will be quite low, which will be disposed off by using sustainable practices of the compost manufacturing. The generated waste will be collected in the bins and at the end of the day it will be dumped in the ground. The generated compost will be used for the horticultural practices at site.

No hazardous waste will be generated in the process activity. Regular training will be given to the workers dealing with the waste management it will include identification, segregation and management of waste.

3.9 Staff/Manpower

Around 10 workers will be required during process related activity. The breakdown of the workers employed is given below:

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Table 9: Details of the Officers

| Sr# | Designation | No. |
|-----------------------|-----------------------|------------|
| 1 | Production Manager | 01 |
| 2 | Deputy Manager | 01 |
| 3 | Asst. Manager | 01 |
| 4 | HSE Manager | 02 |
| 5 | Electrical Manager | 01 |
| 6 | Mechanical Manager | 01 |
| 7 | Metallurgical Manager | 01 |
| 8 | HSE Inspectors | 02 |
| Total Manpower | | 10 |

3.10 Emergency Preparedness

Emergency response preparedness committee will be formulated consisted of heads of all departments and nominated members. Project Manager will be the head of the team who will chair the Committee. In the case of emergency, he will immediately inform the concerned authorities. HSE Manager will be responsible for on-site HSE management.

First aid facilities will be available at facility which will include; blankets, hot water bottles, sterilized dressing, snake bite kit, cotton and iodine (2% alcohol).

3.10.1 Safety Trainings

Skilled, semi-skilled and un-skilled staff will be provided with proper training about the work and safety practices that need to adopt during the process activities.

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3.10.2 Use of Drugs and Narcotics

Drugs and narcotics are strictly prohibited during working hours in working area. Smoking will be only allowed during rest timings at properly isolated places.

3.10.3 Personal Protective Equipment's

Following Personal Protective Equipment (PPEs) will be provided to the workers:

- ✓ Safety Helmet
- ✓ Safety Shoes/Dry Shoes
- ✓ Dust Mask
- ✓ Safety Gloves
- ✓ Safety Jackets
- ✓ Earmuffs
- ✓ Insulating Gloves and Suits

3.11 Cost and Magnitude of Operation

The proposed project includes the production of different crop fertilizer products.

The activities will include:

- ➔ Installation of the machinery such as fertilizer granulator, Boiler etc.
- ➔ Purchase of lab instruments
- ➔ Installation of the filtration and liquid unit.
- ➔ Health and Safety Management at site
- ➔ Transportation of raw-material and final product
- ➔ Plantation of trees



Figure 5: Fertilizer granulator

3.12 Relocation and Rehabilitation Plan

No structure of any significance stands at the site is proposed to be relocated or dismantled. The project area is owned by the proponent. So, no restoration and rehabilitation is required

3.13 Land ownership Documents

Land ownership documents have been attached as Annexure of this EIA Report, which clearly shows that the selected area for the installation of Agricon Services Pakistan has been owned by the proponent.

3.14 Schedule of implementation

The completion duration of Agricon Services Pakistan is about 9-12 months. There will be a symmetrical process. The process is divided in to 3 phases

Preconstruction phase

This phase includes:

- Site investigation & Evaluation
- Budgeting
- Design
- Schedules of working
- Obtaining all relevant NOC

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Construction phase

This phase includes:

- Management team& Construction Crew
- Excavation
- Construction of building
- Provision of allied facilities
- Mitigation process
- Amenities Development
- Managing safety
- Monitoring & Evaluation

Operational phase

This phase includes:

- Implementation of fire safety, emergency evacuation plans
- Security management
- Finishing of amenities
- Production of Fertilizers/Plant operations will start

3.15 Government Approvals

Agricon Services Pakistan is seeking for environmental approval from EPA Punjab.

4 DESCRIPTION OF THE ENVIRONMENT

4.1 General

This Section of the report covers a comprehensive description of the baseline conditions of the project and its related influential area with respect to the physical, biological and social aspects. In addition to the secondary data, the field survey was carried out and the environmental baseline conditions were established based on socioeconomic interviews, impact location profiles; environmental profile questionnaires and public consultations. A social survey was carried out through consultation with various communities. Interviews were conducted from the locals near the project area. The main intention of these interviews was to acquire feedback associated with the project as well as its impacts on their daily life on short term as well as long term basis.

4.2 Methodology

The methodology employed to collect the baseline data and information regarding the social structure and various related parameters as discussed in sub-sections below:

4.3 Data Collection

The primary data was collected by visiting the project area and its communities in its nearby vicinity. The secondary data regarding physical parameters (topography, geology, seismology, and climate) was obtained by visiting relevant various government departments and their official websites. The biological parameters such as flora and fauna were studied by preparing a floristic list based on visual observation and fauna was studied by using opportunities approach. The species were recorded with reference to their existence in the project area. Information on wildlife fauna species (mammals, amphibians, reptiles, birds, etc.) in the assessment area was compiled based on opportunistic observation, gathering the existing information and consultation with local experts, community members and government and Non-Government Organizations (NGOs). The socioeconomic aspects were studied and analyzed by studying detailed village profile and by conducting household surveys.

4.5 Social Survey

The purpose of social survey was to record the present condition of the people living in the project area and to assess the expected project impacts on their life, subsistence systems and socio-cultural conditions. Prior to conducting the field surveys, the following steps were taken:

- ⇒ Clear boundaries of the project area were identified
- ⇒ Decided the sampling procedure in order to draw a representative sample size of the target population and households
- ⇒ Developed the tools for data collection i.e. questionnaires to access the socio-economic status of the area

4.6 Review of Legal and Administrative Framework

The objective of reviewing legal and administrative framework is to obtain information on all legislation pertaining project development. The Socio-Environment Team of reviewed the environmental policies, national, international and provincial laws and guidelines relevant to the development of project which helped in systematic identification of impacts.

4.7 Baseline Conditions

Baseline conditions refer to the existing physical, environmental and socio-economic status of the project area. On the basis of baseline information, the project interventions are assessed and mitigation measures are proposed. The baseline information also helps to indicate the specific issues to be monitored during construction and operational phases. The baseline data (physical, biological and socio-economic parameters) related to the project area is described below. Information provided is based on primary and secondary data collected by site visits, desk studies and consultation with locals respectively. This section gives the overview of the topology, geology, seismology and meteorological conditions of whole city whereas, it gives detailed information about the surface water, ground water and air quality of the project area. The detail of each parameter is discussed in sub-sections below:

4.8 PHYSICAL RESOURCES

This section provides a clear description of the physical resources such as topography, soil, climatic conditions, surface and groundwater resources and quality, ambient air quality and geology of the project site but also city as a whole. The description of physical environment of project site is presented in following subsections

4.8.1 Topography, Geology and Soil

The district forms a central portion of the Chaj Doab lying between the Jhelum and Chenab rivers. It lies from 30° 8' to 32° 40' N and 73° 36' to 73° 37' E. The Tehsil headquarters towns of Phalia and Malikwal are 22.5 and 28.5 kilometres (14.0 and 17.7 mi) from Mandi Bahauddin, respectively. It is bounded on the north by the Jhelum river, which separates it from Jehlam district; on the west by Sargodha district; on the south by the river Chenab (which separates it from the Gujranwala and Hafizabad districts); and on the east by Gujrat district. The total area of the district is 2,673 square kilometres (1,032 sq mi). The district comprises the Mandi Bahauddin, Phalia.

4.8.2 Hydrology

City:

The sub soils and sub strata encountered in the area have been formed by alluvial deposits transported by ancient streams of the Indus River System. The unconsolidated sediments are to a depth of about 900 feet. The groundwater recharge is mainly derived from the seepage of unlined canals, watercourses and from irrigation practices. Recharge directly from rainfall is small. Also, some recharge takes place from ponds, water supply and sewerage systems.

Groundwater is the major source of water in the study area, which is extracted with the help of pumps and motors. The groundwater extracted is used to fulfil various domestic, irrigation and industrial needs. Unfortunately, the ground water of the city Mandi Bahauddin is satisfactory, hence, acceptable for human intake.

Project site:

A Canal at distance of 650m is available near site. Groundwater from depth of 70-75 ft can be used for drinking and other purpose.

4.2.3 Seismicity

Seismic Zoning Map of Pakistan showing Proposed Project site area is presented in figure below indicating zones according to the Building Code of Pakistan - 2007. The city of Mandi Bahauddin, the project site falls in Seismic Zone 2A according to the Seismic Zoning Map of Pakistan.

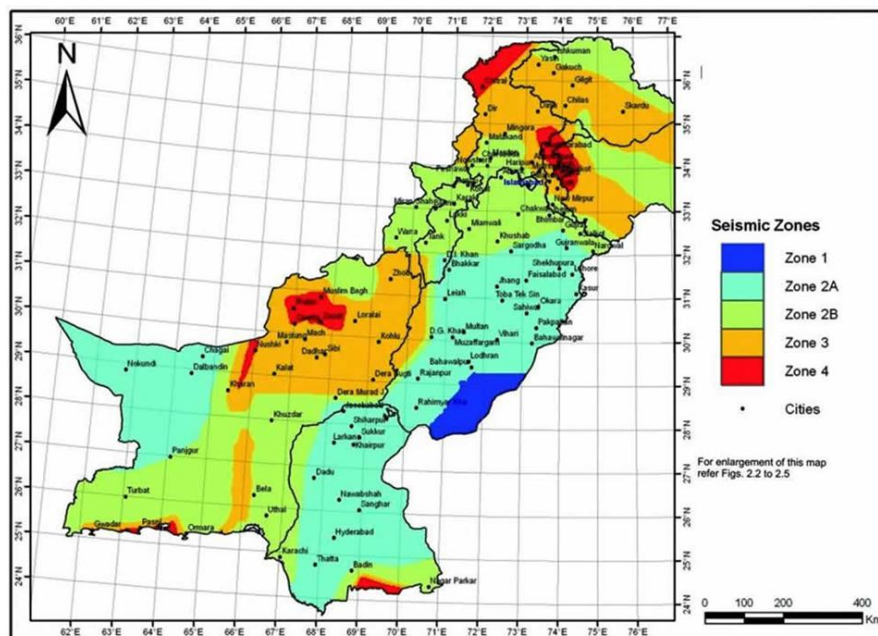


Figure 6 Seismic Zoning Map of Pakistan

4.8.4 Geography

The district forms a central portion of the Chaj Doab lying between the Jhelum and Chenab rivers. It lies from 30° 8' to 32° 40' N and 73° 36' to 73° 37' E. The tehsil headquarters towns of Phalia and Malikwal are 22.5 and 28.5 kilometres (14.0 and 17.7 mi) from Mandi Bahauddin, respectively. It is bounded on the north by the Jhelum river, which separates it from Jehlam district; on the west by Sargodha district; on the south by the river Chenab (which separates it from the Gujranwala and Hafizabad districts); and on the east by Gujrat

district. The total area of the district is 2,673 square kilometres (1,032 sq mi). The district comprises the Mandi Bahauddin, Phalia, and Malikwal tehsils.

4.8.5 Temperature

The climate of the district can see extremes, with a summer maximum temperature 45 °C (113 °F) and a winter temperature of 12 °C (54 °F). The mean maximum and minimum temperature in summer are 39 °C (102 °F) and 27 °C (81 °F) respectively. In winter it peaks at around 17 °C (63 °F) and 12 °C (54 °F) respectively. The summer season starts from April and continues until October. May, June and July are the hottest months. The winter season starts from November and continues until March. December, January and February are the coldest months.

Detail description of the seasons is as under:

- Winter (October to February): Moderate to extreme and dry
- Spring (March & April): Pleasant and moderately cold
- Summer (May to September): Very hot to humid
- Monsoons (June to August): Wet. Although the temperatures are milder but due to appreciable humidity, the heat is oppressive; and
- Post-Monsoon Summer (September & October): Moderate and slightly humid

Given below are the maximum and minimum temperatures of Mandi Bahauddin throughout the figure.

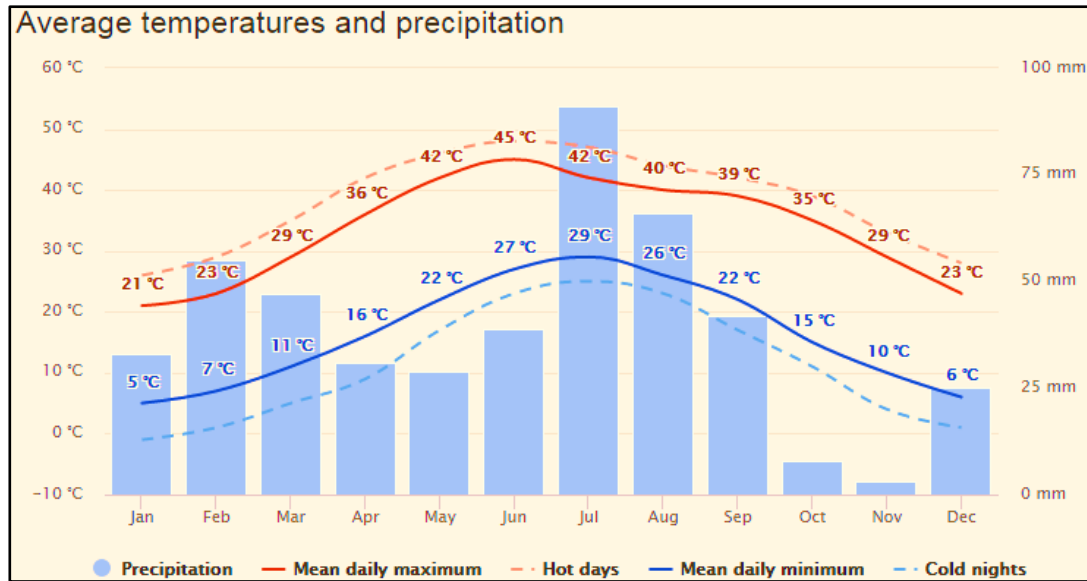


Figure 7: Average Annual Temperatures and precipitation in Mandi Bahauddin

The "mean daily maximum" (solid red line) shows the maximum temperature of an average day for every month for Mandi Bahauddin. Likewise, "mean daily minimum" (solid blue line) shows the average minimum temperature. Hot days and cold nights (dashed red and blue lines) show the average of the hottest day and coldest night of each month of the last 30 years. For vacation planning, you can expect the mean temperatures, and be prepared for hotter and colder days. Wind speeds are not displayed per default but can be enabled at the bottom of the graph.

The precipitation chart is useful to plan for seasonal effects such as monsoon climate in India or wet season in Africa. Monthly precipitations above 150mm are mostly wet, below 30mm mostly dry.

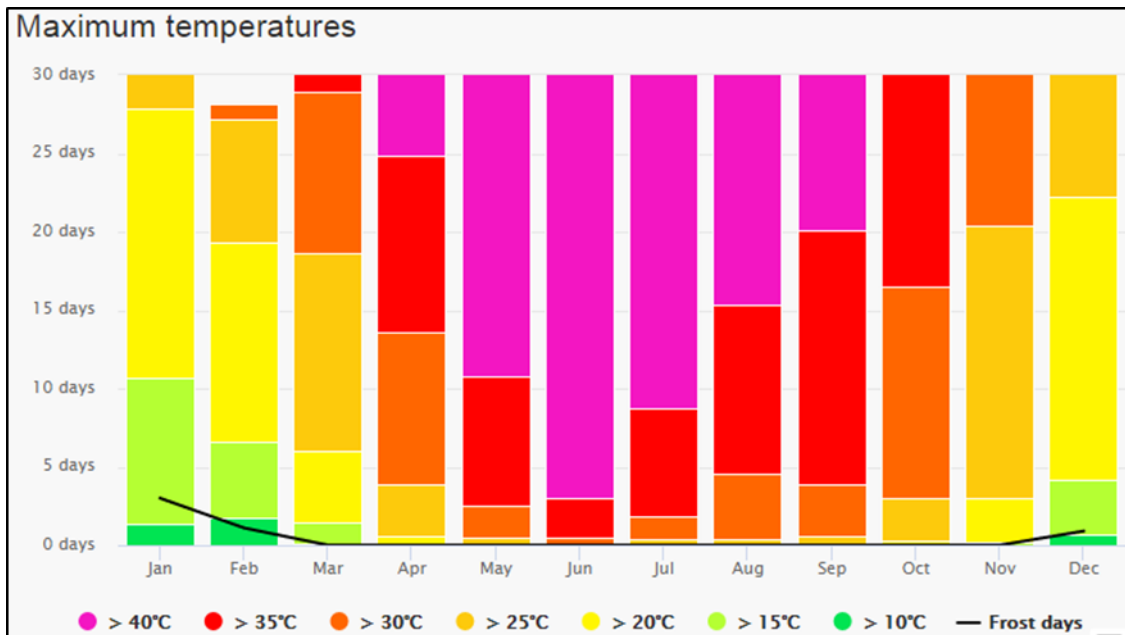


Figure 8: Maximum temperature ranges in Mandi Bahauddin

4.8.6 Rainfall

The average yearly rainfall lies only at about 388 mm (15.3 in) and is highly seasonal with approximately half of the yearly rainfall in the two months July and August.

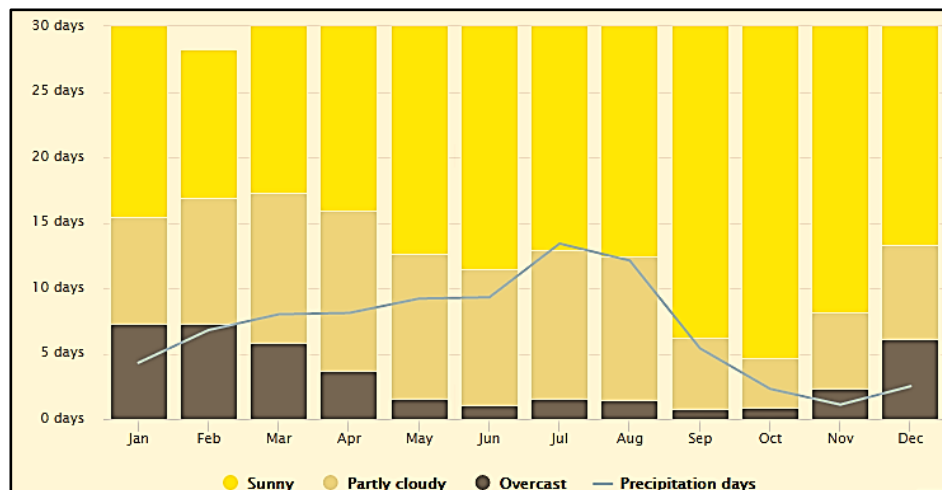


Figure 9: Annual cloudy, sunny and precipitation days in Mandi Bahauddin

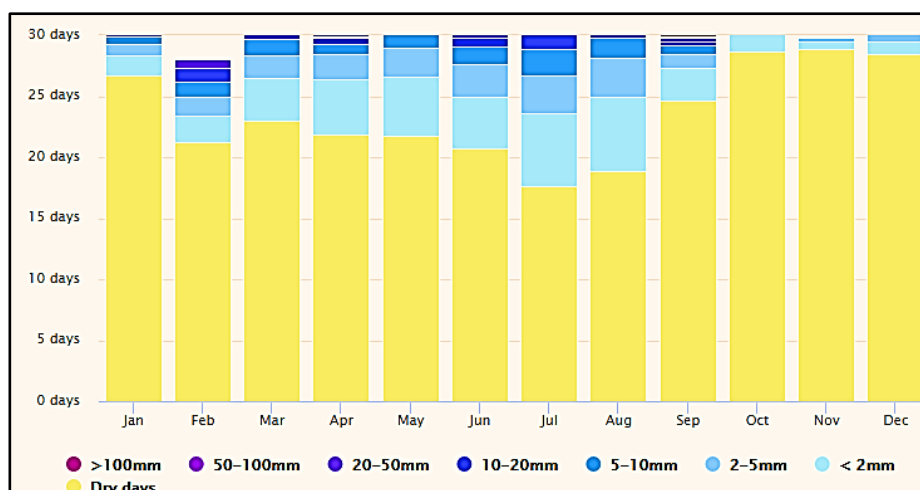


Figure 10: Annual Precipitation amounts in Mandi Bahauddin

4.8.7 Wind

The region experiences westerly and north westerly winds during the winter and spring seasons, known usually as the dry stable times of year and southerly and south easterly winds during summer and monsoons. Wind speeds are low during winter picking up during spring season and peaking during the summer months. The prevalent wind speed ranges from 10-25 km/h, however on some days, there appear storms of 60 km/h.

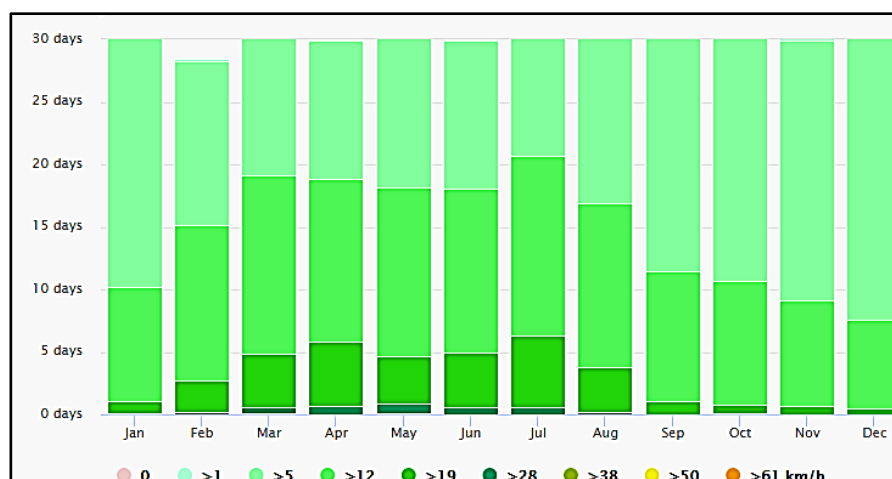


Figure 11: Annual average wind speed in Mandi Bahauddin

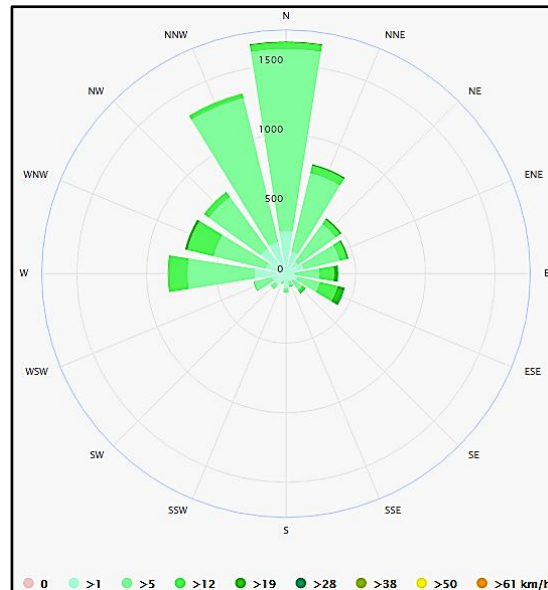


Figure 12: Wind Rose diagram of Mandi Bahauddin

Project Site:

Wind direction observed at site was NW and speed was 10 km/H.

4.8.8 Noise Level

Noise is described as an unwanted sound emitted from un-avoidable sources of anthropogenic activities. Daily based natural induced sources of noise are rare to none but human induced noise sources are plenty and un-avoidable. Physically, there is no distinction between sound and noise. Sound is a sensory perception and the complex pattern of sound waves is labelled noise, music, speech, low altitude aero plane flying etc.

Environmental noise is a common cause of hearing loss of people indulged in industrial activities. Noise pollution in the city is on the rise with most residents complaining that the noise is becoming a public nuisance.

Project Site:

Noise level was monitored at the time of field survey.

4.8.9 Ambient Air Quality

The degradation of air quality in all the large cities is a major environmental concern these days. Air pollution levels in urban centers have either crossed safe limits given in the PEQS or have reached the threshold values.

About 60 to 70 % of the deterioration in the air quality is due to the vehicular emissions. The parameters which have proved to be the major threat are particulate matter and concentration of oxides of nitrogen that are relatively higher in all the large cities of Punjab.

Atmospheric pollution particularly in urban area has a strong impact upon daily life. Mandi Bahauddin is the main city of Pakistan. Its economic growth, industrial progression & transport have risen to grounds responsible for growing energy consumption leading ultimately to the consequences of increase in air pollution. The main sources of air pollution are exhaust from motor vehicles and industries. The main exhaust gases include SO₂, NO₂, CO, etc. Particulate Matter (PM) and noise which are inspected as the pollution indicators.

It was observed during the visit that Petrol and Diesel operated vehicles are emitting smoke and exhaust gasses in excessive quantity which are the leading sources of environmental pollution and responsible for the air quality worsening. In fact, exhaust emissions (including dangerous gases such as carbon monoxide, oxides of nitrogen, hydrocarbons and particulates) and Evaporative emissions (including vapors of fuel which is released into the atmosphere, without being burnt) are the prime reasons of deterioration of air quality. It was however observed during the visit that environment of the project area is clean.

Project Site:

Ambient air quality was monitored during field survey of site.

4.9 BIOLOGICAL ENVIRONMENT

Mandi Bahauddin is enriched with the presence of natural flora and fauna, although with the growing population and development activities, the presence of the sum has been somewhat affected.

There are however no significant or well-shaped trees and shrubs on the project site. There are some trees only along the main roads.

4.9.1 Flora

Trees, also called the 'lungs' of the earth, are important for the restoration of the ecosystem. People can benefit incalculably from their survival and existence. Trees have also been a source of medicine for thousands of years and a refuge for various species of birds.

Project Site:

No threatened or endangered species and medicinal plants are present in the project area. No vegetation or plants will be removed due to commencement of project as the site was clear and no flora existed there. Talli, Baccane, Eucalyptus and Neem are present around the project site.

However proper tree plantation and green belts are planned by the proponent as marked on map and is under-development. Greenery and trees are present in surroundings of site too. Site area is agricultural in nature.

4.9.2 Fauna

With an increase in the rate of urbanization, the ecology of Mandi Bahauddin has been considerably affected but there is no threatened or endangered species found in the project site. No wildlife was present there. Only cats, dogs, sparrows and crows passed by temporarily. No permanent habitat of any fauna was found.

4.10 SOCIOECONOMIC ASSESSMENT

Socioeconomic Assessment is represented by the human and economic development and quality of life values. For the study of socio-economic environment of the project area, field surveys were conducted, and interviews were held with the general public and neighbors.

4.10.1 Demographic Profile

The Demographic Studies are the major source of any city's Socio-Economic profile. Demographic Studies relate to population. Population studies are extremely important from

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Town Planning point of view. Until and unless we know about population in detail, we cannot do successful planning. All aspects of population, such as sex-age composition, trend of migration, social, cultural, political, economic and administrative works, values and facilities have to be related to planning considerations and decisions. Individuals are the raw material of society; therefore, society is directly affected by size, growth, composition and distribution of its individuals. The term population refers to the number of individuals living within a geographical area at a given time.

Different community individuals in the vicinity of the project area have different family sizes depending upon their living setups. Average family size is however 5-7 individuals per family with 1-2 earning hands per family. Since the proposed project is located in an agricultural area, most of the individuals are associated with the agricultural activities.

4.10.2 Health Facilities

As the project site is located in an agricultural area. Villages area present in the vicinity of the project site. Fever, malaria and chest congestion, Hepatitis-C were reported as the common diseases of the project area. In the project area, health conditions are adequately available. Only RHC (Rural Health Centre) Basic Health Centre and Fouji Foundation Medical Centre serving for major general health facilities and many other private centres also adjacent.

4.10.3 Educational Facilities

As the project site is not located in any residential area. However, District Mandi Bhauddin have many renowned and upright government and private schools, colleges and university.

4.11 SOCIO-ECONOMIC PROFILE OF PROJECT AREA

4.11.1 Demographic Characteristics of the Population

The field survey (including interviews, focus group discussions, census, and area profile) was carried out to collect the socioeconomic data from the project affected people as well as other general population to accomplish the baseline information, which will provide the basis for subsequent monitoring and evaluation studies.

The demographic features include the information on household's profile, gender composition, occupations, and literacy status of the population residing in the project area. The information relating to the demographic profile of the people in the project area are described below.

4.11.2 Family Size

Based on the field survey of local population, the average family size computed to be 7.5.

4.11.3 Age Groups

Ages of the consulted population were also recorded. The people interviewed for the socio-economic assessment belongs to different age groups i.e. 20-35 years, 36-45 years, 46-55 years, and 56 years and above.

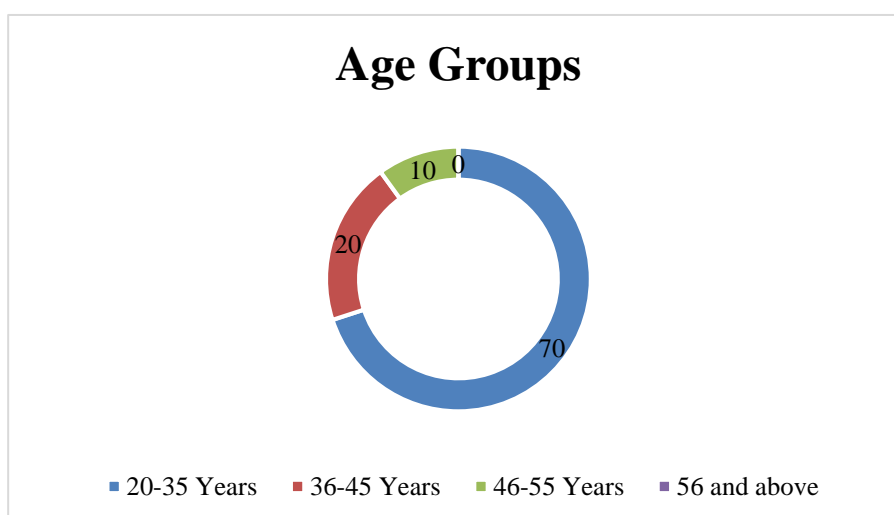


Figure 13: Consulted age groups in the area near project site

4.11.4 Occupation of Respondents

Majority of the respondents (55%) are attached with agriculture, 20% shopkeepers and remaining 25% are labours. During survey, efforts were made to interact with people representing all walks of life. The detailed graphic representation of occupational status is given below:

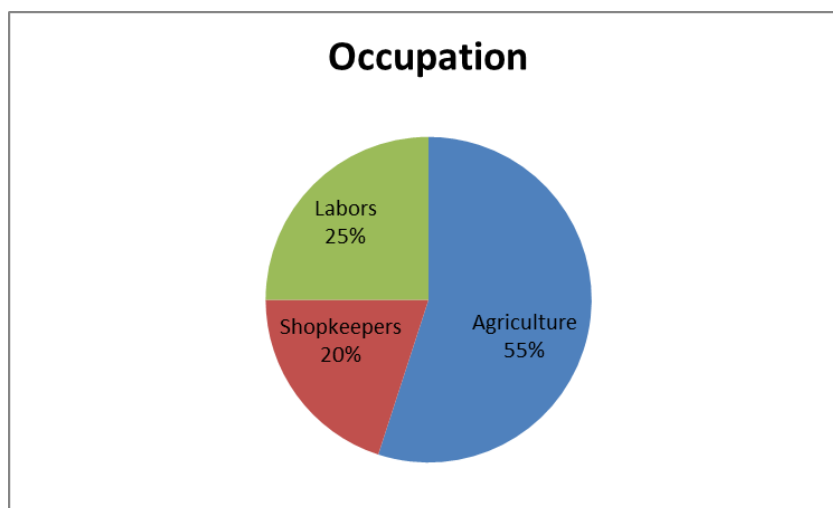


Figure 14: Occupation of Respondents

4.11.5 Literacy Rate

From survey results, it was found that 75 % of the studied population was illiterate, 15% was up to primary level, 10% studied up to middle level.

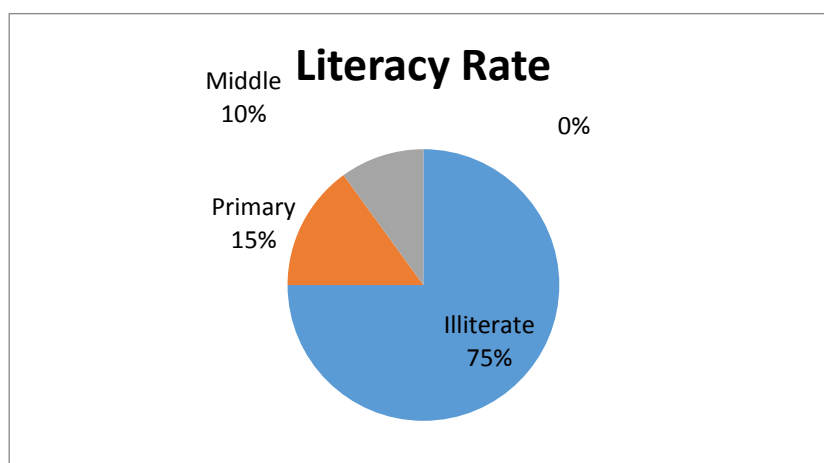


Figure 15: Literacy Rate

4.11.6 Common Diseases

According to the survey the common disease recorded in the project area is Hepatitis.

4.11.7 Cultural, Religious & Other Structures

No cultural, religious and other structures are present in the close proximity of the project area that needs to be relocated. Villages present around the project site have mosques and religious centers.

4.12 SOCIOECONOMIC SURVEY AND PUBLIC CONSULTATION

For ascertaining the perceptions of different stakeholders about the project, meetings were held with them. These meetings were held in an open atmosphere, in which participants expressed their views freely. Informal group discussions were also held as an additional tool for the assessment of the perceptions of the stakeholders.

4.12.1 Methods of Public Consultation

Public Consultation was carried out for a day. Socio-economic survey forms are attached as Annexure with IEE report. The following methods were used for public consultation with project stakeholders in order to ascertain their stakes regarding project implementation.

- Focused Group Discussion
- Scoping Sessions
- Formal Group Meetings
- Informal Group Meetings

4.12.2 Project Response

93% of the respondents were of the opinion that this project should be implemented. In their opinion, construction of the project will create labour opportunities for locals and it will help to improve economic conditions of area. The respondents also provided the mitigation measures like certified contractor must be hired, proper plantation should be done, proper procedures should be followed etc. They said, if mitigation measures will be implemented they would have no objection.

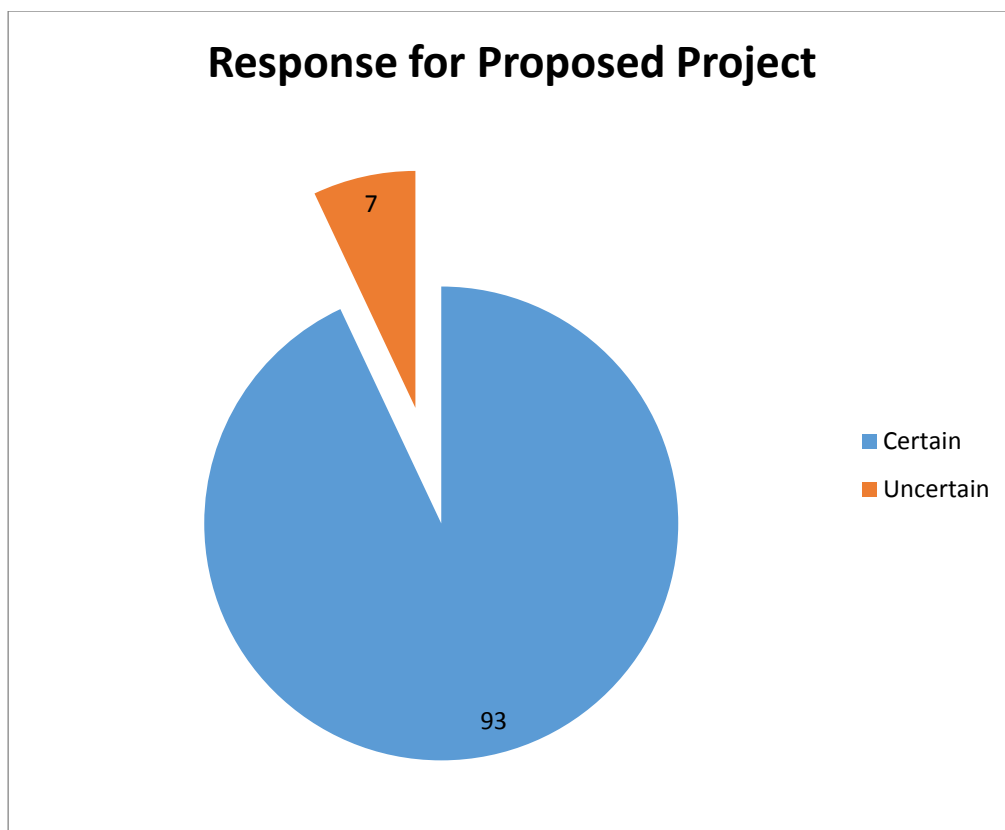


Figure 16: Percentage of people in favour or against the project

SITE SUITABILITY

Keeping in view the above facts and figures it clearly shows that there is no environment sensitive inhabitant are present in site vicinity as well as no physical resources will get affected by the project activities, Hence the site is suitable for the proposed project.

5 PUBLIC CONSULTATION AND INFORMATION

DISCLOSURE

Public consultation refers to the process by which the concerns of local affected persons and others who have a plausible stake in the environmental impacts of the project or activity are ascertained with a view to taking into account all the material concerns in the project or activity design as appropriate. According to the IEE and EIA Review Regulations, public consultation is mandatory for any socio-environmental study.

5.1 General

Impact assessment survey and public consultation sessions held with different stakeholder groups that may be impacted by the proposed project commencement. The consultation process was carried out in accordance with the guidelines laid by Punjab-EPA. The objectives of this process were to:

- ⊙ Share information with stakeholders on proposed project installation and operation
- ⊙ Assess the impacts on the physical, biological, and socioeconomic environment
- ⊙ Understand stakeholder concerns regarding various aspects of the project commencement
- ⊙ Find out valuable suggestions by the stakeholders to improve the proposed project design
- ⊙ Understand the perceptions, assessment of social impacts and concerns of the affected people/communities of the project area
- ⊙ Find out the awareness level and situation of acceptability to identify any issues for the implementation of the proposed project
- ⊙ Invite people to express their views about the positive/negative impacts on their lifestyles and environment
- ⊙ Disclose information about contact offices/officers for any complaints/queries

It is envisaged, there will be no social impact being foreseen due to the construction and operation of Agricon Services Pakistan at the proposed location. Kaloo Khurd is present near the project area is at the distance of 1245 meters from the project area. This EIA Report includes all the comments, which were taken into account during the social survey and preparing the definitive development concept for the installation and operation of fertilizer manufacturing plant in G. Public consultation performas is attached as Annexure of this EIA Report.

5.2 Objectives of Consultation

Public consultation plays a vital role in studying the impacts of the proposed project on stakeholders in successful implementation and execution of the project. It provides an opportunity to exchange knowledge with the beneficiaries and affected parties. Referring particularly to a project related to environmental assessment, involvement of the public is all the more essential, as it leads to better and more acceptable decision-making. The overall objective of the consultation with the stakeholders is to help verify the environmental and social issues, besides technical ones, that have been presumed to arise and to identify those which are not known or are specific to the project. In fact, discourse with many who have thoroughly observed the site conditions in the pre-development phase, goes a long way in updating the knowledge and understanding.

5.3 Identification of Stakeholders

All the people who are directly or indirectly affected or concerned with the project are the stakeholder. Besides the living population of the surrounding areas, some other stakeholders were identified and contacted which enlisted below. They are the key players including; shops, public and government offices, schools, university, hospitals, hotels, international agencies and the NGOs. Not only published material, brief or other literature were obtained on request, but also noted their views and the concerns, in an official capacity as well as on the personal basis. Following stakeholders are identified for this project:

Project Affected Persons (PAPs) include the settled families, either property owners or the tenants, businessmen (big, shopkeepers, vendors, etc.), employees of the commercial entities. PAPs are of two types, for instance:

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5.3.1 Direct Stakeholders

As, no disturbance in the local community is being foreseen due to the installation of the fertilizer manufacturing plant as the minimum distance between the community and the project area at the distance of 1245 meters (Karoo Khurd). No property loss is being envisaged due to the construction of the Agricon Services Pakistan.

5.3.2 Indirect Stakeholders

Indirect impact will occur on those who are living or doing business within a Project Area of Influence (AOI). In the case of the proposed project, the citizens of nearby small towns (Karoo Khurd) will get opportunities of being employed. So, in the early development stages and during the operational phase the people will be benefited due to the installation of the Agricon Services Pakistan. Indirect respondents include;

- ❖ Government agencies responsible to deal with the project related activities
- ❖ Government Agencies directly, indirectly or widely involved in the execution and monitoring of the proposed project
- ❖ Government departments such as TMA and Planning & Development Department, working on the other development activities are considered as indirect stakeholders
- ❖ Workers of political, cultural, religious or social scientific bodies, directly or indirectly related to the project

5.4 Public Disclosure

Public disclosure is the outcome of all such activities where the public is involved at least in the information sharing process. This is an integral part of the process. So, before the proponent applies for NOC to the Punjab-EPA, this disclosure will be distributed properly among all stakeholders. It is the responsibility of the proponent and the consultants to display a public disclosure document in prominent places where community has easy access.

5.5 Consultation Process

Information disclosure, public consultation and discussion regarding the various aspects of the project with the people of the area are necessary. This process is intensified during the EIA Studies, and separate rounds of public consultations were held. Surveys were carried out in order to investigate physical, biological and socioeconomic resources falling within the immediate AOI of the project. Primary data collection included:

- ⊙ Data collection regarding the socioeconomic condition of the study area
- ⊙ Pre-testing of socioeconomic survey tools in the field
- ⊙ To consult the locals for collection of information on biological environment

Various meetings with the stakeholders were held the following objectives:

- ⊙ Share information with stakeholders on the proposed project and expected impacts on community in the vicinity of the project
- ⊙ Understand stakeholders' concerns regarding various aspects of the project, including the existing condition of the upgrading requirements, and the likely impact of construction and operation activities
- ⊙ Provide an opportunity to the public to influence the project design in a positive manner
- ⊙ Obtain local and traditional knowledge, before decision making
- ⊙ Increase public confidence about the proponent, reviewers and decision makers
- ⊙ Reduce conflict through the early identification of controversial issues, and work through them to find acceptable solutions
- ⊙ Dissemination of information through discussions, education and liaison
- ⊙ Documentation of information narrated by the stakeholders and mitigation measures proposed by the stakeholders
- ⊙ Incorporation of public concerns and their address in the EIA; and eliciting their comments and feedback
- ⊙ Create a sense of ownership of the proposal in the mind of the stakeholders

5.6 Participants of Public Offices Contacted

Officers of government departments were consulted by the socio-environmental team of the consultants and concerned details about the project were noted down through personal interviews, group meetings, etc., in their offices, for instance.

5.7 Consultation with Beneficiaries

In addition, to the use of direct methods to evince the response of the various stakeholders in the population of the study area was ascertained by conducting a sample survey, through specially formatted questionnaires (attached in the Annexure of this EIA Report). Questions posed to the public were related to creation of possible impacts, adverse impacts and beneficial impacts, including; employment opportunities, income generation activities, change in living standards and provision of the amenity.

- ➔ Disclose the proponent plan of the construction of the proposed facility
- ➔ To share information on the design and specifications of proposed project works
- ➔ To analyze the expected impact on the socioeconomic environment
- ➔ To understand their concerns regarding various aspects of construction and operation






5.7.1 Views, Concerns and Suggestions of Various Stakeholders

Community showed a lot of concerns; a few are being mentioned here:

- ☐ Removal of shrubs and trees should be avoided to the extent possible
- ☐ The project will become the source of income for local to earn their livelihood easily and honorably
- ☐ The area will become further industrialized
- ☐ For the solid waste management and waste disposal, proper disposal techniques should be adopted

- ☐ Employment opportunities will be generated, and locals should be hired on the priority basis
- ☐ The air pollution is one of the major impacts of the proposed project so ambient air quality should be monitored regularly
- ☐ Water spraying/sprinkling should be done on the regular basis during construction phase to avoid dust emissions
- ☐ Removal of shrubs and trees should be avoided to the extent possible
- ☐ Good relations with the local communities will be promoted by encouraging Contractor to provide opportunities for skilled and unskilled employment to the locals as well as on-job training
- ☐ The contractor should prefer hiring local labor from adjacent nearby villages
- ☐ Indigenous tress around the facility should be planted to control air pollution and as the compensation
- ☐ Noise reducing barriers should be installed to reduce noise pollution as the nearest community lies within the radius of 0.8 km

Concerns

-  Workers should be hired from local community
-  Proper disposal of solid waste should be practiced
-  The provision of fertilizer should be at economical rates for poor farmers
-  Indigenous tress around the facility should be planted to control air pollution
-  Removal of shrubs and bushes should be avoided to the extent possible

5.7.2 Addressing Public Concerns

The best mechanism of effective communication between the community and the proponent is the by the nomination of the representative of the community and all the issues/concerns

must be recorded for future reference. This representative may be the member of the Grievances Redressed Committee (GRC).

a. Grievances Redressed Committee

Grievances Redressed Committee (GRC) will be formulated by the proponent to address the concerns of the locals during the construction phase. The main role of the GRC will be to resolve the issues of the community associated with the proposed project, if any.

5.8 Acceptance Level of the Project

The opinions of the respondents were noted during the public consultation. The majority of respondents (88%) of Kaloo Khurd were in favor of the proposed project. They expect that installation of the fertilizer manufacturing unit will also increase the economic value of local assets. According to them the proposed project will boost the employment opportunities, mobility access to resources and social amenities.

Table 10: List of People Consulted

| Sr. No | Name | Father | CNIC No. | Concern/Views |
|--------|-----------------------|------------------|-----------------|---------------------------------|
| 1. | Saleh Muhammad | Sahi Muhammad | 38401-0222635-9 | Positive |
| 2. | Muhammad Adil Shabbir | Muhammad Shabbir | 34401-8650991-9 | Positive |
| 3. | Arfan ul Haq | Iftikhar ul Haq | 34401-0614977-7 | Positive |
| 4. | Ali Haider | Pervaiz Ahmad | 34401-6518156-3 | Concerned about Water pollution |
| 5. | Arfan Shabbir | Muhammad Shabbir | 34401-0578174-9 | Concerned about Noise pollution |
| 6. | Nadeem Akhtar | Safdar Ali | 34401-0578159-3 | Positive |
| 7. | Allah Ditta | Zulfiqar | 34401-7581096-3 | Positive |

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ENVIRONMENTAL IMPACT ASSESSMENT

**AGRICON SERVICES PAKISTAN
MANDI BAHAUDDIN**

| | | | | |
|-----|-------------------|-------------------|-----------------|----------|
| 8. | Muhammad Boota | Abdul Raheem | 34401-5243917-9 | Positive |
| 9. | Jabir Ali | Saleh Muhammad | 38401-0222636-9 | Positive |
| 10. | Arshed Mehmood | Saleh Muhammad | 38401-6769711-5 | Positive |

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6 IMPACT ASSESSMENT METHODOLOGY

This section discusses the potential environmental impact of Fertilizer manufacturing unit. The impacts may include the disturbance of area's geomorphology, soil, water resources, air, biological resources and socio-economic condition and, where applicable, identifies mitigation measures that will reduce, if not eliminate, its adverse impact. The assessment carried out in this Section is based on potential impacts on overall environmental receptors within the project area.

6.1 Objectives

The objective of screening is identification of the adverse as well as beneficial impacts and then mitigating the effect of adverse impacts up to acceptable limits or within PEQS. Following are the objectives of screening out all significant environmental and social impacts:

- ☐ To find different alternatives and ways of carrying out the project activities which may cause adverse impacts
- ☐ To enhance the Environmental and Social benefits of project
- ☐ To avoid, minimize and remediate adverse impacts
- ☐ To ensure that residual adverse impacts are kept within acceptable limits

In the sub-sections below the impact's assessment methodology for the establishment of fertilizer unit, located in Mandi Bahauddin has been defined. It includes the magnitude, the extent of the impact and the nature of the anticipated impact.

6.2 Methodology

This Section discusses the project's potential environmental impact of establishment of the fertilizers on the area's geomorphology, soil, water resources, air resource, biological resources and socioeconomic condition and, where applicable, identifies mitigation measures that will reduce, if not eliminate, its adverse impact. The assessment carried out in the sub-sections below is based on potential impacts on overall environmental receptors within the project area. Impacts are evaluated based on magnitude, immediacy and sustainability. Evaluation criteria are as follows:

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6.2.1 Magnitude

The magnitude of the impacts associated with the establishment of Crops fertilizer unit include the type of impact project commencement will cause to its immediate environment and social structure. It could be direct, indirect and cumulative.

6.2.2 Immediacy

Immediacy of the impact focus on the following parameters:

- ⇒ Temporal Extent (during construction and operation)
- ⇒ Spatial Extent (local or widespread)

6.2.3 Sustainability and Reversibility

Sustainability and reversibility of the impact focused on the following parameters:

- ⇒ Mitigability (Fully/Partially)
- ⇒ Monitoring (Fully/Partially)

6.3 Purpose of Mitigation Measure

The basic purpose of mitigation measures is to reduce the impacts of the establishment of fertilizer manufacturing unit on the socio-environment up to the maximum possible extent. The mitigation measures are suggested based on the following parameters:

6.3.1 What is the problem?

The proposed project is of manufacturing of Crops fertilizers which are organic in nature. The nature of the land is open land having native vegetation such as Neem, Kikar, Safeda and wild grass. The study area is fertile, leveled and agricultural land. In addition, to the noise and fugitive dust emissions during the development phase solid waste management and disposal issues may arise along with wastewater disposal issues. There are few minor impacts associated with the operation of manufacturing unit includes the management of the municipal solid waste generated during the, raw-material storage which will be managed according to local practices of area.

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

The impacts from the establishment of fertilizer manufacturing unit will occur during the construction and operation due to the civil work involved and the people residing in the project area. These issues included; noise generation, fugitive dust emissions, solid waste management, wastewater disposal, top-soil removal, Health and Safety issues and change in the geographic features of the area. These all problems should be addressed on-site where they are being generated, to avoid the residual or adverse impacts.

6.3.3 Where problem should be addressed?

The problem will be generated from site development and operation of the unit. So, it should be addressed on source i.e. at site within the same timeframe.

6.3.4 How the problem should be addressed?

Proper mitigations measures will be provided according to the nature of the impacts/problems. For example, against dust emissions sprinkling of water may be done on regular basis, for solid waste proper solid waste management and disposal practices may be adopted, to manage liquid waste proper treatment may be made before discharging into the receiving body. The change landscape is estimated to be quite minor and the removed topsoil may be used to reclaim the disturbed areas.

6.3.5 Ways of Achieving Mitigation Measures?

Following ways will be adopted to reduce the impacts of the fertilizer manufacturing:

6.3.6 Changing in Planning Design

There is no endangered and threatened species present in the project area. Moreover, there is not any human settlement or infra-structure that will be dislocated or dismantled due to the proposed project development. Hence, there is no need to change the design of project.

6.3.7 Improved Management and Monitoring Practices

The anticipated impacts had been reduced significantly by adopting better management activities, as it will be carried out for betterment of the society. While environmental monitoring will be conducted on the regular basis to keep the sources of the air pollution, wastewater generation, noise and public nuisances in-check. Following practices that need to be adopted to reduce the impact significantly:

a. Compensation in Money Terms

Due to the installation of the fertilizer plant, the vegetation present on-site will be removed and the geography/landscape of the area will be changed on the permanent basis, however, there is no protected or environmentally sensitive area present within 10.0 km vicinity of the project that could be impacted. Hence, no compensation in the monetary terms will be required. However, for the removal of the one tree from the project area 3-5 trees will be planted as the compensation.

b. Replacement/Relocation/Rehabilitation

The proposed project is located in open land where there is no sensitive area, human population or preserved natural resource is present which could be impacted due to the commencement of the proposed project. No replacement, relocation and rehabilitation will be required for the commencement of the aforesaid project.

6.4 Impacts Associated with Project Location

The proponent has selected the site owing to the following reasons:

- ⇒ There is no community or human settlement present on-site or in the project proximity that could be impacted due to the commencement of the proposed project
- ⇒ There is no fauna or flora belonging to an endangered species present on-site
- ⇒ The site has accessible through road network i.e., connected to the main road via access roads
- ⇒ There is no ecologically sensitive or declared protected area like; Reserved Forest, Fish Hatcheries, Wildlife or Game Reserves. Moreover, there is no socio-cultural

significant structure (historical or archaeological site or religious structures; Masjid, temples, etc.) located within 5 km of the selected site that could be impacted

It can be concluded in view of these reasons that the selected site is best suited for the project and will not pose any adverse impact or threat on any component of the environment.

6.5 Impact Assessment Methodology

The impact assessment methodology for the installation of the fertilizer manufacturing is given below:

6.5.1 Screening of Potential Impacts

Based on site visit, observation, brain storming, provided information and social interviews, significant impacts were anticipated and evaluated. Then qualitative and quantitative (where possible) assessment of these anticipated impacts is to be carried out.

6.5.2 Identification of Mitigation Measures

After anticipation and screening of significant impacts, certain mitigation measures are to be provided in order to enhance benefits of project and reducing impacts. These measures can be classified as:

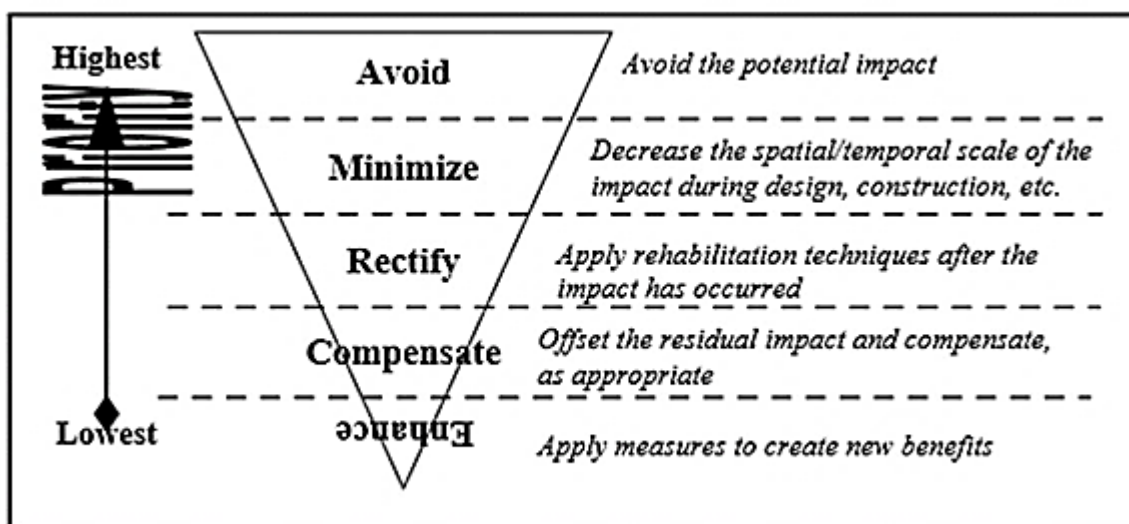


Figure 17: Hierarchy of Mitigations

6.5.3 Evaluation of the Residual Impacts

Incorporation of suggested mitigation measures may reduce the magnitude of the environmental impacts of the project but sometimes, it may fail in bringing them within the acceptable limits. This step refers to the identification of the anticipated remaining impacts after mitigation measures have been applied.

6.5.4 Identification of Monitoring Requirements

The last step in the assessment process is the identification of minimum monitoring requirements. The scope and frequency of monitoring depends on the residual impacts. The purpose of the monitoring is to confirm that the impact is within the prescribed limits and to provide timely information if acceptable limits are being breached.

7 SCREENING OF IMPACTS AND THEIR MITIGATION

MEASURE

This Chapter identifies the potential impacts (positive and adverse) on the physical, biological and socio-economic environment of project area due to the establishment of fertilizer manufacturing units. It also identifies measures that will help to mitigate the adverse environmental impacts and will enhance positive impacts of the project. Impacts are assessed by analyzing their magnitude and sensitivity, which is a legal requirement.

7.1 Impact Evaluation

Impact screening checklist and project impact evaluation matrix have been developed to evaluate the potential impacts of the establishment of fertilizer manufacturing plant on the basis of set procedures as given in the environmental guidelines by Punjab EPA.

7.1.1 Methodology for Impact Evaluation

These tools have been used to identify the significance and magnitude of the impact as well as the nature, reversibility and extent:

1. An Impact Screening Checklist
2. Project Impact Evaluation Matrix

Following is given a brief description of assessment tools:

a) Impact Screening Checklist

The impact screening checklist is developed to screen out the potentially insignificant environmental and social impacts from the potentially significant adverse environmental and social impacts during planning & designing, construction and operational phases of the project. The objective of the impact screening process is to assess the significance of the issues related to the air, water, noise, soil, transportation, communication, the hazards and external constraints. The positive and adverse impacts of the project during planning & designing, construction and operational phases are identified based on their duration,

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location, frequency, extent, significance and reversibility. Each activity impacts on various environmental parameters are given below:

Table 11: Impact Screening Checklist

| Sr# | Environmental Component | Impact Characteristics | | | | | | | | | | | | |
|--------------------|------------------------------|-------------------------------------|-------|-------------------------------------|-------------------------------------|-------------------------------------|--------------|--------|-------------------------------------|--------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| | | Duration | | Location | | Frequency | | Extent | | Significance | | | Reversibility | |
| | | Long | Short | Direct | Indirect | Continuous | Intermittent | Wide | Local | Large | Moderate | Minor | Rev. | Irrev. |
| Beneficial Impacts | | | | | | | | | | | | | | |
| 1 | Employment Opportunity | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| 2 | Availability of Raw-Material | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> | |
| 3 | Appreciation in Land Value | <input checked="" type="checkbox"/> | | | <input checked="" type="checkbox"/> | <input checked="" type="checkbox"/> | | | <input checked="" type="checkbox"/> | | | <input checked="" type="checkbox"/> | | <input checked="" type="checkbox"/> |

ENVIRONMENTAL IMPACT ASSESSMENT

**AGRICON SERVICES PAKISTAN
MANDI BAHAUDDIN**



| | | | | | | | | | | | | | |
|------------------------|-----------------------------|---|---|---|---|---|---|---|---|---|---|---|---|
| 4 | Energy Availability | ☐ | | ☐ | | ☐ | | ☐ | | ☐ | | ☐ | |
| Adverse Impacts | | | | | | | | | | | | | |
| 1 | Air Pollution | | • | • | | • | | • | | | • | • | |
| 2 | Wastewater | | • | • | | • | | • | | | • | | • |
| 3 | Solid Waste and By-Products | • | | • | | • | | • | | • | | | • |
| 4 | Health and Safety | | • | | • | | • | | • | | • | • | |
| 5 | Chemical Hazards | | • | • | | • | | • | | • | | • | |
| 6 | Physical Hazards | | • | • | | • | | • | | | • | | • |
| 7 | Security Risks | | • | | • | | • | | • | | • | | • |

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b) Project Impact Evaluation Matrix

The Project Impact Evaluation Matrix was developed by placing different environmental parameters that are likely to be affected by the proposed project actions, grouped into categories i.e., physical, ecological and socio-economic environment. For the impact assessment risk assessment methodology was used. Moreover, the risk assessment was done on the basis of project phases (planning & designing, construction and operation). A Project Impact Evaluation Matrix is attached as Table below:

Table 12: Impact Evaluation Matrix

| Environmental Parameters | Impact Assessment during operational Phase |
|---------------------------------|---|
| A: Physical | |
| Land Resources | |
| Soil Erosion and Contamination | 0 |
| Transportation | -1t |
| Solid Waste and By-Products | -2p |
| Land Use | NA |
| Air Resources | |
| Noise Pollution | -1t |
| Air Pollution | -2t |
| Dust Emissions | -1t |

| | |
|------------------------------------|-----|
| Water Resources | |
| Ground Water | -1p |
| Surface Water | NA |
| Wastewater | -2p |
| B : Ecological | |
| Flora | |
| Tree Cutting | +1p |
| Fauna | |
| Terrestrial Fauna | +1p |
| C: Socio-Economic | |
| Employment Opportunities | +3p |
| Land Value Appreciation | +2t |
| Availability of Local Raw-Material | +2p |
| Economic Uplift | +3p |
| D: Hazards | |
| Physical Hazards | -1p |
| Chemical Hazards | -1p |
| Health and Safety | -1p |

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Legends: 1= Low; 2= Medium; 3= High; 4= Extremely High; NA= Not Applicable; t= Temporary; p= Permanent; app= Applicable; 0= Negligible

7.2 Impact and Mitigation Management

Purpose of mitigation is to evade, reduce or balance the expected antagonistic effects in suitable way and to integrate these for devising environmental management strategy or plan. At every stage of the project, mitigation plan for all the adverse impacts should be predicted to find out the best alternative. The objectives of mitigation are to:

- ★ Invention of best substitution, better alternatives and ways to reduce the adverse environmental and social impacts on the surroundings
- ★ To improve the environmental and societal payback of the project
- ★ To prevaricate, remedy or reduce, pro-vocative impacts
- ★ To certify that remaining negative influences are kept within permissible limits

In this part of the EIA Report, several complications including cleanliness, environmental health and safety, societal and environmental managing and inspection, industrial vulnerability, tools and apparatuses and during operational activities, influx of workers and procurement of land have been deeply elaborated.

7.2.1 Approaches for Mitigation Measures

Following approaches may be used to mitigate the impacts of the project:

Table 13: Approaches for Mitigation Measures

| |
|---|
| Avoid: Change of route or site details, to avoid damage important ecological or archaeological features |
| Replace: Regenerate similar habitat of equivalent ecological value in different location |
| Reduce: Filters, precipitators, noise barriers, dust, enclosures, visual screening, wildlife corridors and changed time of activities to reduce the impact |
| Restore: Site restoration at the end of the operational activities |
| Compensate: Relocation of displaced communities, facilities for the affected communities, financial compensation for the affected individuals, etc. |

7.3 Expected Positive Impacts

Following are the expected outcome of the establishment of the fertilizer manufacturing unit:

7.3.1 Increase in Employment Opportunities

Due to the establishment of fertilizer manufacturing unit in Mandi Bahauddin the employment opportunity will be enhanced. During construction phase 10-20 workers will work and during operational phase the manpower number may be up to 10. It will include technical and non-technical staff. Locals will also have the opportunity to diversify their income by being employed. Hence, there will be an increased employment opportunity for the local people which will have a positive impact on the socio-economic status of the area.

7.3.2 Economic Uplift of the Area

In addition to all these benefits, the project will result in the general economic and social uplift in the areas of the Punjab Province as it will provide raw material for other allied industries such as feed in the region.

7.3.3 Raw-Material Availability

Currently, the demand of the fertilizers has increased many folds in the country due to the various agricultural innovations. Agricultural sector is the basic department in all the developmental activities of country. Due to the installation of the proposed project fertilizer products will be added in the existing market which is considered insufficient to fulfill the ever-increasing demand.

7.3.4 Enhance Competitiveness of Domestic fertilizers

The installation of the proposed project will have following benefits:

- ➔ Improve global competitiveness of Pakistan by providing high-quality fertilizer material to cope with increase in demand of the crop stimulants.
- ➔ Address the aggravated chronic shortage of organic fertilizers used in the agricultural sector
- ➔ Enhance competitiveness by helping industries located in Lahore, Mandi Bahauddin and Sheikhpura to save logistics costs

7.4 Adverse Impacts and Mitigation Measures

This section identifies the potentially significant and insignificant adverse environmental and social impacts anticipated during the planning & designing, construction and operation phases for the establishment of fertilizer manufacturing unit. Appropriate mitigation and management measures, where applicable, have also been suggested to reduce the severity of the anticipated impact up to the extent possible.

7.4.1 Impacts and Mitigations during Design Phase

During planning and designing phase most of the associated impacts will be associated with the selection of the appropriate location and design that would have minimal impact on the environment and society. It will include:

i. Location

The project is proposed to be installed in open area. No residential community is located within 1.0 km vicinity from the project area that would be impacted from the commencement of aforesaid project. There is no human settlement, heritage building, social structure, grassland or preserved area in the project vicinity that could be damaged, dislocated or dismantled due to the project activity in the proposed area. Hence, the impact of location is considered to be in-significant as the project site is away from the surface water body, residential area (Bundowani 1,256 Meters), Shrine (not reported in the study area) and no protected area is reported in 10km vicinity. The project is being constructed in the agricultural open area.

Nature of Impact

The nature of the proposed impact will be direct, low, short-term and hence in-significant.

Mitigation Measures

Following mitigation measures will be adopted to reduce the impact of the proposed project location on the sensitive receptors:

- The wastewater will consist of mainly of the domestic waste (municipal waste), the wastewater generated during processing will be reused in the manufacturing process. It will be disposed off by using standard practices of the area
- It is envisaged that no mitigation measures will be required as the proposed project will not have any adverse impacts on its surroundings due to significant distances from sensitive receptors

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ii. Designing

The design of the Granulation and filtration units will be energy efficient and will cause moderate adverse environmental impacts as compared to the other technologies available in Pakistan. The Proponent intends to reduce the environmental and social up to practically possible safe limit. The Client had adopted SOPs for Emergency Responses Plan, Fire Fighting Plan and Disaster Management Plan which are explained in sub-sections below.

Nature of Impact

The nature of the proposed impact will be direct, low, short-term and hence in-significant.

Mitigation

Following mitigation measures will be adopted;

- ⇒ The project will be designed by keeping in mind the principles of energy conservation and sustainable development
- ⇒ The storage areas will be covered in order to prevent leaching of chemicals
- ⇒ Municipal wastewater will be managed effectively through settling tanks
- ⇒ The factory will be installed in an area designated as green space where crops and various native trees will be planted.

iii. Land Use

The project area is being constructed in an open land. There is no settlement, surface water body, grassland or preserved area in the proximity of the project area that could be damaged or dismantled due to the establishment of fertilizer unit. Due to the establishment of this unit the open land will be converted to the built-up land.

Nature of Impact

The nature of the impact will be in-direct, medium, short-term and hence significant.

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Mitigation

Following mitigations measures will be adopted to reduce the land use impact:

- ★ Unnecessary up-rooting and disturbance to the native vegetation should be avoided up to the extent possible
- ★ The designated green area will be vegetated and native vegetation present on-site will be preserved
- ★ It is suggested that a green area should be defined and thick trees plantation should be carried out along the boundaries of the project area to decrease the rate of soil erosion
- ★ Preferably trees and other vegetation should be planted extensively so that a buffer zone around project area can be created
- ★ Vegetation will not only enhance the aesthetic outlook of the area but it will also absorb pollution from the atmosphere

iv. Tree Cutting

It is envisaged that few kikar, Safeda and Neem tree along with the wild grass will be uprooted at main project site during the site clearness which impact the ecology of the area.

Nature of Impact

The nature of the impact will be direct, low, short-term and hence significant.

Mitigation

Following mitigation measures will be adopted:

- Avoid un-necessary disturbance and removal of the tree
- The designated green area will be vegetated and native vegetation present on-site will be preserved

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- Biodiversity at the site will be maintained by transplanting or culturing endangered or threatened plants found in District Mandi Bahauddin.
- Green belts should be planned in the surroundings
- Native tree plantation should be promoted extensively

7.4.2 Impacts and Mitigations during Construction Phase

Following impacts are anticipated to occur and affect the nearby communities due to the establishment of fertilizer unit:

i. Impacts of Dust and Exhaust Emissions

Air quality is expected to deteriorate locally due to mainly fugitive dust emission and exhaust emission from vehicles, which will have short-term but moderate impacts on local environment. Soil erosion may occur in small areas and they may be prone to open space for wind to pick up dust particles. Air pollutants such as; NO_x, SO_x and CO emissions may be generated from the working of the construction machinery on-site which includes; Hauling vehicles, loaders, trucks, mixers, etc. This machinery will generate dust, smoke and other potential pollutants in the air. This impact is considered to be negative of minor magnitude. The effect due to construction is however, of temporary nature and will have no permanent impact on environment.

Nature of Impact

The nature of the proposed impact will be direct, medium, short-term and hence significant.

Mitigation

Dust control measures are important in the project area; as the area is semi-arid having dry soil conditions and its vulnerable to spread by high winds. Following mitigation measures will be adopted to mitigate the anticipated impact:

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- Ensure that the trucks carrying the raw material should be covered by tarpaulin to reduce fugitive dust emissions
- Water spraying/sprinkling should be done on the regular basis
- Ensure that all equipment and vehicles, used during the construction phase, are properly tuned and maintained in good working condition, in order to minimize the exhaust emissions and it will be regulated by the concerned authority
- Ensure that high quality fuel having low sulphur contents will be used
- Ensure that dust emission generated due to vehicular movement is minimized by restricted speed limit and vehicular movement impacts which will be minimized through good traffic management at site
- Ensure that dust emission during the construction phase will be minimized by implementing best management practices
- In order to reduce the fugitive dust emissions, avoid excavation activities during the windy days

ii. Soil Erosion and Contamination

During the constructional activities the chances of soil erosion and contamination may be increased. Soil erosion from the construction activities will deteriorate the soil quality. There are low chances of land contamination due to release/spill of lubricants, oil, and other materials during the construction period. Erosion may also result from movement of heavy vehicle such bulldozers, excavators, trucks and pick-ups. The impact will be short term, localized and can be controlled through immediate appropriate management and mitigation measures. This impact is considered negative of minor magnitude. Hence, the impact is in-significant.

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Nature of Impact

The nature of the proposed impact will be direct, medium, short-term and hence significant.

Mitigations

Following mitigation measures will be adopted to protect the soil from erosion and contamination:

- Removal of shrubs and bushes should be avoided to the extent possible
- In case of un-avoidable circumstances, the exposed soil will be re-vegetated quickly and compensatory plantation (five trees for each one removed) will be carried out as soon as possible
- Spill prevention and response plan for storage, usage and transfer of fuel should be prepared (if used on site) and implemented
- Workers should be trained on spill prevention and response plan
- Maintenance and washing of vehicles and equipment should be carried out at designated areas
- Any hard surface or tarpaulin should be spread on area to prevent soil contamination
- Regular inspections should be carried out to detect leakages in construction vehicles and equipment
- Machinery involved should be maintained properly to avoid leakages

iii. Socioeconomic Impacts

In project area, no significant changes are envisaged in the traditional lifestyle and occupation of the local people in residing in the nearby communities. The local people are rather benefited due to the provision of job opportunities. No impact is envisaged due to the influx of the workers as the local will be preferred and hired for working. Social

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issues may arise which will cause minor negative impact on the social lifestyle of the people. Moreover, health and safety related issues may arise during the construction activities. These impacts are in-significant can be further reduced significantly by adopting best management practices.

Nature of Impact

The nature of the proposed impact will be direct, low, short-term and hence in-significant.

Mitigation Measures

Following mitigation measures will be adopted to reduce the socio-economic impact on the community:

- Good relations with the local communities will be promoted by encouraging Contractor to provide opportunities for skilled and unskilled employment to the locals as well as on-job training
- In the case of not hiring the locals, Contractor will restrict his permanent staff to mix with the locals to avoid any social problems
- The contractor should prefer hiring local labor from adjacent nearby villages
- The contractor will keep the copy of National Identity Card (CNIC) of his employees and will warn the workers not to involve in any anti-social activities otherwise they may face dire consequences
- At the time of hiring the Contractor has to ensure that the workers should be of good reputation
- First aid kits having all the necessary first aid stuff will be available at the site
- Routine medical check-ups of all the field staff including unskilled labor needs to be conducted by qualified physician and surgeon

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- Training of workers should be carried out for operating various constructional machinery, safety procedures should be adopted, environmental awareness should be carried out, equip all workers with safety boots, helmets, gloves, protective masks and monitoring of their proper and sustained usage will be carried out. In case of accidents, contractor will provide free medical treatment to the community.
- The Contractor will be responsible for the sensitivity towards the local customs and traditions

7.4.3 Impacts and Mitigations during Operational Phase

Following impacts are envisaged due to the establishment of fertilizer manufacturing unit:

i. Solid Waste and Process Waste Products

In the aforesaid project of the fertilizer manufacturing unit, no significant hazardous solid waste will be generated from the processing activities, the only waste generated would be from municipal source. The improper disposal may impose health impacts on the workers and the nearby community because the disease vectors will be produced.

Nature of Impact

The nature of the proposed impact will be direct, medium, long-term and hence significant.

Mitigations

General waste management practices will be adopted which will include:

- Waste bins will be placed in the facility at the strategic position for the collection of solid waste
- The installed bins will be covered in order to reduce the chances of the disease vector production

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- The generated solid waste will be disposed off by using the process of composting and compost will be later on used for the on-site horticultural activities
- Record of all waste generated during the project activity should be maintained on the regular basis. Quantity of the waste disposed, recycled or reuse will be logged on a waste tracking register
- Regular training will be given to the workers dealing with the waste management it will include identification, segregation and management of waste
- Equipment and material containing asbestos, PCBs and ozone depleting substances will not be used

ii. Water Consumption and Wastewater Production

In the aforesaid project, the water will be reused in the processing of raw materials. Processed water is used for the processing of raw material. It is estimated that 500 liters (0.5m³) of water will be consumed for sanitation purposes for 20 workers.

Nature of Impact

The nature of the proposed impact will be direct, low, short-term and hence in-significant.

Mitigations

Following mitigation measures will be adopted:

- Freshwater conservation techniques should be adopted to ensure sustainable development
- Monitoring of effluents shall be carried out as per requirement of Self-Monitoring and Reporting Tools (SMART) to ensure compliance with the NEQS
- It will be ensured that no solid waste will be entered in the wastewater
- There is no surface water body present in the project proximity that could be impacted

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- The evaporation loss may be minimized by adopting closed system.

v. Occupational Health and Safety

The health and safety impacts include:

- Slips, Trips and Falls on the Same Level
- Falls from Height
- Unguarded Machinery
- Falling Objects
- Working in Confined Spaces
- Moving Machinery, On-Site Transport, Forklifts and Cranes
- Contact With Hot Metal
- Fire And Explosion
- Extreme Temperatures
- Noise And Vibration
- Electrical Burns And Electric Shock

Nature of Impact

The nature of the proposed impact will be direct, low, long-term and hence significant.

Mitigation

The following mitigation measures are suggested that could be applied to reduce the risk of health and safety:

- ⊙ Floor surfaces shall be maintained regularly, and kept clean and free of oil spills, other slippery fluids or materials and obstructions.
- ⊙ Workers who may be exposed to noise levels exceeding occupational standards shall receive regular audiometric testing.
- ⊙ The effective use of hearing-protection devices shall be ensured.

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- ⊙ Proper training will be provided to workers entering and working in the confined space of the hazards, protective measures and emergency rescue procedures;
- ⊙ Proper radiation shielding may be provided.
- ⊙ Edged parts of rolls shall be securely guarded to prevent severe injuries.
- ⊙ Transport routes shall be planned and constructed to minimize the risk of collision and with sufficient safe clearance to allow for aisles and turns, or other types of control area. Where appropriate, maps showing the proposed route should be provided.
- ⊙ Transport routes shall be clear of obstructions and, where possible, without irregular surfaces.
- ⊙ Loads should be lowered slowly and smoothly.

vi. Chemical Hazards

Exposure to chemicals (gases and vapors) may occur during the handling of chemicals related to cleaning and disinfecting process areas. Avoid the chemical exposure to the workers who are working in the process area or related to the process.

Nature of Impact

The nature of the proposed impact will be direct, low, long-term and hence significant.

Mitigations

Following mitigation measures will be adopted:

- ✓ Personal Protective Equipment (PPEs) should be given to workers including protection and impermeable clothing for use during disinfection
- ✓ Wearing of the PPEs should be regulated strictly by the concerned authority
- ✓ Chemical spillage will be avoided by developing proper SOPs for the handling of the chemicals

- ✓ Chemicals and detergents will be stored properly, and all precautionary measures will be adopted

vii. Security Risks

A large number of workers will be hired including; engineers and laborers. The increase in the number of the residing in the area, may lead to an increase in crime and violence in surrounding areas. The nature of the impact is considered to be low as the locals will be preferred for hiring.

Nature of Impact

The nature of the proposed impact will be direct, low, long-term and hence significant.

Mitigation measures

- Proper security will be provided to the workers
- Security guards will be appointed
- Before hiring any worker and his criminal record may be checked
- CNIC of all the workers will be kept by the Proponent
- Strict law will be enforced to control the crime at site

Viii. Emergency Response

Emergency response preparedness committee will be formulated consisted of five members. Project Manager will be the head of the team who will chair incident control headquarters. In the case of emergency, it will include; blankets, hot water bottles, stretchers, benches, sterilized dressing, snake bite kit, cotton and iodine (2% alcohol).

Incidents and accidents may take place unexpectedly during project operations no matter how effective, strong and efficient the mitigation measures for all adverse impacts; especially the safety issues may be adopted. These may include; accident and natural disasters.

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Nature of Impact

The nature of the proposed impact will be direct, low, long-term and hence significant.

Mitigation

- Workers should be given adequate training of handling machinery
- Emergency call service must be made available.
- First aid box shall be available within the facility

ix. Socio-Economic Impact

It is envisaged that the local community will be disturbed due to increase in the traffic load i.e., vehicles carrying hens, raw material, final product and by-product. The intensity of the aforesaid project will be quite low. The installation of the aforesaid project will have a beneficial impact such as; increase in employment opportunity, increase of the wages in local area, increase in revenue generation, provision of social welfare funds of the employees and appreciation of land value.

Nature of Impact

The aforesaid impact is considered to be positive and will have a direct, medium, long-term and significant impact.

Mitigation Measure

No mitigation measures will be required.

7.5 Potential Environmental Enhancement Measures

Intensive tree plantation will be done by proponent. Approximately 1000 trees will be planted to enhance the environment.

8 ENVIRONMENTAL MANAGEMENT AND MONITORING

PLANS

This chapter summarizes the various mitigation measures as outlined previously in this EIA Report that will be implemented during the construction, operational and decommissioning stages of project. It does not discuss further the mitigation measures which have been adopted within the design and planning of the project, as these are comprehensively covered in previous section of this EIA Report.

Outline and key features of the EMMP for operations phase is presented. As per the environmental legislation in Pakistan, the EMMP for the operations phase, along with other documents, is to be submitted to the environmental protection agency to obtain confirmation for compliance and Environmental Approval for project operation. Even after implementation of the suggested mitigation measures, the impact may remain significant, and require monitoring.

8.1 Objectives

An Environmental Monitoring Plan was outlined alongside Environmental Management Plan to ensure all the corrective actions to counter adverse impacts which gives a detailed EMMP. The EMMP will serve as a principal execution module of the project that would not only mitigate adverse environmental impacts during the construction and the operational phase of the project but also ensures that environmental standards and good in-housekeeping are being practiced. Continuous environmental monitoring is exercised to ensure that preventive measures are in place and effective to sustain environmental integrity. The key objectives of EMMP are:

- To outline functions and responsibilities of persons
- To state and implement standards and guidelines which are required under environmental legislations particular in context to the Project

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- To facilitate the implementation of the mitigation measures by providing the technical details of each Project's impact and proposing implementation schedule of the proposed mitigation measures
- Define a monitoring mechanism and identify monitoring parameters to ensure that all proposed mitigation measures are completely and effectively implemented
- Identify the resources required to implement the EMMP and outline corresponding financing arrangements

8.2 Management Approach

The organizational roles and responsibilities of the key players are summarized below:

8.2.1 Proponent

The project proponent will undertake overall responsibility for compliance with the EMMP. The concerned departments will carry out verification checks to ensure that the contractors are effectively implementing their environmental and social requirements.

8.2.2 Contractors

The contractors will implement the majority of environmental and social mitigation measures. The contractors will carry out field activities as part of the project. The contractors are subject to certain liabilities under the environmental laws of the country, and under its contract with proponent.

8.3 Components of EMMP

The EMMP consists of the following:

- Institutional arrangements
- Mitigation plan to reduce the severity of associated impacts
- Monitoring plan to monitor the impacts and their severity
- Environmental and social trainings to raise awareness

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8.3.1 Remedial and Mitigation Measures

The objective of remedial and mitigation measures in any project is to identify practices, technologies or activities that would prevent, minimize or mitigate all significant negativities that are likely to occur due to the proposed project.

8.4 Environmental Management and Monitoring Framework

The purpose of the environmental management and monitoring framework is to facilitate the implementation of environmental commitments, included in the environmental impact assessment. The proponent is committed for the protection of the environment and to the sustainable management of its related operations and activities.

Table 14: Environmental Management and Monitoring Plan

| Category | Impact | Project Activity | Monitoring Mechanism | Frequency | Monitoring Agency |
|---------------------------|-----------------------------|---|---|---------------------|-------------------|
| Operational Phases | | | | | |
| Land Resource | Solid Waste and By-Products | Implementation of SW* Management System | Record keeping and timely transfer of SW from bins to the disposal site for ultimate management | Weekly and Annually | Proponent |

| | | | | | |
|----------------------------|--------------------|---|---|---|-----------------|
| | | | t and disposal | | |
| | Soil Contamination | Implementation of Management Plans | Visual monitoring and regular site inspection | Daily and Annually | Project Manager |
| Air Resource | Air Emission | Air quality will deteriorate due to transportation related activities | Monitor the emissions as per PEQ standards | Once before start of operation and after that as when required during operational phase | EA** |
| Ecological Resource | Flora | Uprooting of trees during Construction phase and maintenance of | Re-vegetation during operation phase | During Baseline Survey, once in a year and after the completion | Project Manager |

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| | | | | | |
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| | | photographic record | | of the Project | |
| Wastewater | | Wastewater will be generated mainly from domestic use and cooling tower | Regular testing of the effluents that are being discharged | On the monthly basis | Project Manager |
| *SW= Solid Waste, **EA= Executive Agency | | | | | |

8.4.1 Institutional Arrangements and Responsibilities

The proposed institutional arrangement for the implementation of EMMP is based on the discussions held with the Forest Department, Environmental Protection Department, Local Union Council Office and Proponent. The discussion concluded that three types of institutional arrangements are essential for the effective implementation of EMMP, these are follows:

- Establishment of Environment/Social Management Group
- External Monitoring by EPA certified laboratory
- EMC established by Proponent after consultation with consultant

a. Roles and Responsibilities

Following are the designated roles and responsibilities of the employees involved in the monitoring and management of the adverse impacts:

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Table 15: Roles and Responsibilities

| Roles and Responsibilities | | |
|-----------------------------------|--------------------------|--|
| Sr# | Concerned Persons | Duties |
| 1 | The Project Manager | <p>Following will be the responsibilities of the Project Manager</p> <ul style="list-style-type: none"> • Ensure that the contractor is aware of all specifications, legal constraints, standards and procedures pertaining to the project specifically with regards to environment. • Ensure that all stipulations within the EMMP are communicated and adhered to by contractor(s) • Monitor the implementation of the EMMP throughout the project by means of site inspections and meetings. This will be documented as part of the minutes of the site meeting documents • Ensuring project execution within defined budget and timelines • Conducting regular check of the project status and meetings with project team • Provide support and guidance to project team as and when needed • Project Manager is expected to continually monitor and improve the overall performance of their operation |
| 4 | HSE Manager | In addition to the health and safety responsibilities held by staff, managers and supervisors must do whatever is reasonably |

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| | | |
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| | | <p>practical to ensure that both the workplace and the work itself are safe. This includes:</p> <ul style="list-style-type: none"> • Ensuring that staff are appropriately trained and supervised • Identifying, assessing and managing health and safety risks • Consulting with workers (including staff, affiliates and contractors): <ul style="list-style-type: none"> i. Health and safety risk assessments ii. Decisions are made about the measures to be taken to eliminate or control these risks iii. Health and safety risk assessments • Implementing health and safety risk management programs relevant to their operations, teaching, research and consulting functions and work environment • Reporting (to the Human Resources Unit), investigating and responding to all hazards, accidents, incidents and taking action to control the risk • Assisting with the development, implementation and maintenance of a return to work program for injured staff. • Be fully conversant with the EIA and conditions of its approval • Be fully conversant with the EMMP • Be fully conversant with all relevant environmental legislation, policies and procedures, and ensure compliance |
|--|--|--|

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| | | |
|--|--|---|
| | | <ul style="list-style-type: none"> • Convey the contents of this document to the contractor site staff and discuss the contents in detail with the Project Manager and Contractor • Undertake regular and comprehensive inspection of the site and surrounding areas in order to monitor compliance with the EMMP • Take appropriate action if the specifications contained in the EMMP are not followed • Monitor and verify that environmental impacts are kept to a minimum, as far as possible • Review and approve construction methods, with input from the Site Manager, where necessary • Ensure that activities on site comply with all relevant environmental legislation • Compile progress reports on regular basis, with input from the Site Manager, for submission to the Project Manager, including a final post excavation audit • Liaise with the Site Manager regarding the monitoring of the site • Report any non-compliance or remedial measures that need to be applied • All environmental problems arising on the construction area will be reported to the Site Manager by the Environmental Manager. Reports on such problems will be submitted to the Project Manager by the Site Manager |
|--|--|---|

8.4.2 Impacts Management and Monitoring Plans

The following environmental issues are considered to warrant specific management actions for the implementation of project. These issues have specific regulatory requirements (contained in the development consent or Environmental Approval) and/or are considered to have the potential to result in a non-compliance with a legislative requirement or generate community complaints. To manage the adverse environmental impacts on the physical parameters of the environment following management and monitoring plans will be adopted:

Table 16: Air Quality Management and Monitoring Plan

| Air Quality Management and Monitoring Plan | |
|---|--|
| <i>Potential Impacts</i> | Operational Phase |
| | Dust emissions and particulate matter during the transport of material |
| <i>Mitigation</i> | Installation of dust collection and control equipment to minimize the emissions |
| <i>Plan</i> | <ul style="list-style-type: none"> Regular sprinkling of water will be done to control the suspended dust particles during the construction phase The transporting vehicles will be maintained on the regular basis Enforce strict speed limits to reduce airborne fugitive dust emission from vehicular movement Minimize the land disturbance as much as possible by re-vegetating disturbed areas as soon as possible Regular water sprinkling to suppress the fugitive dust emissions during the construction work Cover dump trucks before travelling on public roads |

| | <ul style="list-style-type: none"> • Train workers to handle loose materials and debris to reduce fugitive emissions • Water sprinkling will be done on the regular basis during the construction phase • Good quality (low sulphur) fuel will be used in the vehicle to ensure less emissions • Visual inspections to detect air pollution generated during the construction phase will be carried out on the regular basis • Indigenous trees around the facility will be planted to control the odour and air pollution • Rehabilitation of areas outside of the site security fence will be undertaken by the successful implementation of the landscaping plan • Tree species like <i>Dalbergia sissoo</i>, <i>Cassia seamea</i>, <i>Acacia mangium</i> and <i>Peltaphorum</i> can be planted in areas as they have high growing rate as well they will help in noise, dust and pollution reductions. | | |
|------------|---|----------------------------|---------------------|
| Monitoring | Responsibility | Responsible | Monitoring Duration |
| | <ul style="list-style-type: none"> • Preparation of required or requested information for submission to the Project Manager including air quality monitoring data • Liaising with the Project Manager | Project Manager/Contractor | As & when required |

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| | | | |
|--|---|--|--|
| | with respect to all significant air quality matters | | |
|--|---|--|--|

Table 17: Solid Waste and By-Products Management and Monitoring Plan

| Mine Waste Management and Monitoring Plan | |
|--|---|
| <i>Potential Impacts</i> | Operation Phase |
| | No hazardous waste will be generated in the process activity except the municipal waste. In addition, domestic solid waste will be generated . |
| <i>Mitigation</i> | Waste Management Plan |
| <i>Management Plan</i> | <p>⇒ Hazardous and non-hazardous waste will be separated prior to the transportation of the waste. As the aforesaid project generates no hazardous waste, no segregation is required.</p> <p>⇒ Record of all waste generated during the project activity should be maintained on the regular basis. Quantity of the waste disposed, recycled or reuse will be logged on a waste tracking register</p> <p>⇒ Regular training will be given to the workers dealing with the waste management it will include identification, segregation and management of waste.</p> <p>General Waste</p> |

- ⇒ General waste cannot be recycled or used, it will be stored in appropriate receptacles and picked up as required by a worker and will be disposed of at the designated sites/bins
- ⇒ The generated waste will be collected by the contractor on the regular basis and will be disposed off by using standard practices
- ⇒ No on-site burning of wastes will be allowed at any time
- ⇒ Tree species like *Dalbergia sissoo*, *Cassia seamea*, *Acacia mangium* and *Peltaphorum* are ideal for bio-reclamation of overburden dumps.

Green Waste

- ⇒ It will be ensured that minimum green waste will be generated on-site
- ⇒ It will be generated from landscape maintenance activities. It will be reused on-site where possible or disposed off uncontaminated by using the standard practices at the designated sites.
- ⇒ Green waste can be used as the fuel wood by the nearby residents.
- ⇒ No on-site burning of green wastes will be allowed at any time on-site

Solid Waste

- ⇒ For the collection of the solid waste at site bins will be installed at various positions in the proposed facility
- ⇒ The installed bins will be covered in order to reduce the chances of the disease vector production and ensure the health of the workers

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| | ⇒ The amount of the solid waste generation will be disposed off by using the standard practices in the area | | |
|------------|---|-----------------|------------------------------------|
| Monitoring | Responsibility | Responsible | Monitoring Duration |
| | <ul style="list-style-type: none"> Coordinate the training needs for all employees in environmental awareness training as a legal responsibility Waste collection and disposal will be monitored on a regular basis Solid Waste documentation will be completed and available for inspection on request A complaints register will be held, complaints will be investigated and, if appropriate, acted upon | Project Manager | Visual Monitoring on Regular basis |

Table 18: Wastewater Management and Monitoring Plan

| Wastewater Management and Monitoring Plan | |
|---|-----------------|
| | Operation Phase |

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| | | | |
|------------------------|--|--------------------|----------------------------|
| Potential Impacts | During the operational phase chances of the groundwater contamination will be quite high if un-treated wastewater will be discharged in the waterways. It is estimated that 0.4m ³ per day of municipal wastewater will be produced. The water will be used for the cooling of the plant and as a result 50% of the water will be loss as a result of evaporation No process wastewater water will be produced that need treatment. | | |
| <i>Mitigation</i> | Sanitary wastewater treatment system such as septic tank will be constructed on-site for the disposal of wastewater. | | |
| <i>Management Plan</i> | <ul style="list-style-type: none"> Monitoring of effluents shall be carried out as per requirement of Self-Monitoring and Reporting Tools (SMART) to ensure compliance with the PEQS There is no surface water body present in the project proximity that could be impacted due to the discharge of the wastewater The closed system should be installed for the cooling of the plant to ensure the minimal water loss Good in-house keeping practices should be adopted to ensure water conservation Closed the taps when water isn't in use The domestic wastewater will be discharged into the septic tank prior to final disposal in the sewerage line. The design specifications of the septic tank are: The wastewater after primary treatment will be used for on-site horticultural activities and the excess wastewater will be disposed off in the nearby wastewater drain after necessary approval | | |
| <i>Monitoring</i> | Responsibility | Responsible | Monitoring Duration |

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| | | | |
|--|--|-----------------|---------|
| | Monitoring of the safe disposal of the generated wastewater as per Environmental Monitoring of this EMMP | Project Manager | Monthly |
| | A complaints register will be held, Complaints will be investigated and, if appropriate, acted upon | | |

Table 19: Transport Code of Conduct

| Transport Code of Conduct | |
|----------------------------------|---|
| | Operation Phase |
| <i>Potential Impacts</i> | During operational phase, vehicles carrying the raw material may impact the nearby community by the frequent movement. It may generate fugitive dust emissions, noise and may cause social issues. |
| <i>Mitigation</i> | Traffic Management Plan |
| <i>Management Plan</i> | <p>The traffic management plan is given below:</p> <ul style="list-style-type: none"> • Heavy vehicles shall only be to enter and leave the site between during day hours. • The need to ensure that noise levels are kept to a minimum especially through the site and into the relevant zone • Loads entering or leaving site will be suitably covered to ensure loads are secure • Proper maintenance and tuning of the vehicles should be carried out to ensure the minimum emissions |

| | | | |
|-------------------|---|--------------------|----------------------------|
| | <ul style="list-style-type: none"> • High quality (low sulphur) fuel will be used to keep the emissions in check • Strict speed limits will be enforced to reduce the chances of accidents • A complaints register will be kept, complaints will be investigated and, if appropriate, will be acted upon | | |
| <i>Monitoring</i> | Responsibility | Responsible | Monitoring Duration |
| | Informal Observations Report on Compliance | Project Manager | Weekly basis |

Table 20: Health and Safety Management and Monitoring Plan

| Health and Safety Plan Management and Monitoring Plan | |
|--|--|
| <i>Physical Hazards</i> | <p>The health and safety risks to workers include but are not limited to:</p> <ul style="list-style-type: none"> • Floor surfaces shall be maintained regularly and kept clean and free of oil spills, other slippery fluids and obstructions • Workers who may be exposed to noise levels exceeding occupational standards shall receive regular audiometric testing • The effective use of hearing protection devices shall be ensured • Proper training will be provided to workers entering and working in the confined space of the hazards, protective measures and emergency rescue procedures • Only authorized persons shall be allowed near grinding unit |

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| | |
|-------------------------|---|
| | <ul style="list-style-type: none"> • People working in and around the processing areas shall be provided with suitable PPEs to protect them against molten metal burns, noise and physical hazards • Proper radiation shielding may be provided • Edged parts of rolls shall be securely guarded to prevent severe injuries • Transport routes shall be planned and constructed to minimize the risk of collision and with sufficient safe clearance to allow for aisles and turns, or other types of control area. Where appropriate, maps showing the proposed route should be provided. • Transport routes shall be clear of obstructions and, where possible, without irregular surfaces. • Loads should be lowered slowly and smoothly to avoid physical hazards |
| <i>Chemical Hazards</i> | <p>Following mitigation measures will be adopted:</p> <ul style="list-style-type: none"> • Personal Protective Equipment (PPEs) should be given to workers including protection and impermeable clothing for use during disinfection • Wearing of the PPEs should be regulated strictly by the concerned authority • Chemical spillage will be avoided by developing proper SOPs for the handling of the chemicals • Chemicals and detergents will be stored properly, and all precautionary measures will be adopted |
| <i>Security Risks</i> | <p>To eliminate the security issues following mitigation measures will be adopted:</p> |

- Proper Security will be provided to the workers
- Security guards will be appointed
- Before hiring any worker and his criminal record may be checked
- CNIC of all the workers will be kept by the Proponent
- Strict law will be enforced to control the crime at site

8.4.3 Biodiversity Management and Monitoring Plans

As far as the management plans are concerned, they will protect the environment and mitigate the adverse impacts but, in order to keep in check the whole biodiversity of the project and study area a bio-diversity plan is required. During construction and operational phase there would be a removal of flora from the designated areas. The biodiversity plan is designed to mitigate the immediate as well as aftereffects. The detailed bio-diversity management plan includes the following sub-plans:

Table 21: Biodiversity and Invasive Plants Management and Monitoring Plan

| Procedure for Prevention/ Mitigation of Impact from Invasive Plants | |
|---|---|
| <i>Potential Impacts</i> | If suitable controls are not adopted invasive species could colonize the site, reducing biodiversity and threatening the ecology of the area. It would largely impact flora and fauna of the area. Although Sheikhpura District is not rich in biodiversity. The remnants of the native vegetation will be at the verge of disturbance and removal. |
| <i>Management Plan</i> | <p>Following management practices will be adopted:</p> <ul style="list-style-type: none"> • Sowing/planting will be undertaken as soon as possible following the closure of the exhausted pit, to reduce the likelihood of the |

| | |
|---------------------------|--|
| | <p>exposed areas being colonized by invasive and non-native species which are of lower ecological values</p> <ul style="list-style-type: none"> • Reasonable precautions will be taken during operational phase to avoid the spreading of soil borne pests and diseases, animal and crop diseases and invasive species. • The ecological; verification walkover of the whole site will check the status of known stands of alien/invasive plants and record any new stands |
| <i>Monitoring</i> | Monitoring will be undertaken by HSE Manager throughout project life. |
| <i>Emergency Measures</i> | <ul style="list-style-type: none"> • Environmental Coordinator to be informed immediately if any new stands of alien or invasive weeds are found. • Where invasive species are found, an environmental exclusion zone will be created. This will entail a physical fence and proper signage. • A liaison with local landfills to check the specific arrangements they require for the disposal of constructional waste arising, which may be treated as hazardous waste |

8.4.4 Decommissioning Plans

Following management plans will be adopted to manage habitat during operational as well as at the end of the operational phase to reduce the envisaged impacts. At the end of the operational phase following practices will be adopted to reclaim and restore the site:

Table 22: Habitat Management Plan

| Habitat Management Plan | |
|--------------------------------|--|
| <i>Potential Impacts</i> | If suitable mitigation was not implemented chance of loss or damage of valuable local habitats could arise. This would reduce local biodiversity and the rate of soil erosion will increase many times. |
| <i>Management Plan</i> | <ul style="list-style-type: none"> • If required by the HSE Manager will be constrained to a prescribed working corridor thereby reducing damage to habitats, potential direct mortality and disturbance to species • Existing trees and vegetation will be retained wherever practicable and incorporated with new planting proposals • Vegetation buffer strips will be maintained where practically possible. • Vegetation clearance will involve the removal of the shrubs and grasses be agreed with the HSE Manager and Contractor, if required • An environmentalist will perform a pre-clearance site visit to advise the contractors on which trees can be retained as they are which can be retained with some remedial works and which need to be removed • Where the removal of dead standing is necessary, the material will be relocated into areas of existing and newly created green zone within the limits of the site where practicable. • Sowing/planting will be undertaken as soon as possible to reduce the likelihood of the areas being colonized by invasive species which are of lower ecological value. |

- During the operational phase, management and maintenance of roadside verges is to be undertaken to maintain and enhance floral diversity
- Appropriate management will be undertaken of existing bound habitats such as hedges for the conservation concern for; tree sparrow (*Passer montanus*), House Sparrows (*Passer domesticus*), House Crow (*Corvus splendens*), Domestic Pigeon (*Columba livia domestica*), Parrot (*Psittaciformes*), Quail (*Coturnix coturnix*), teetar (*Francolinus pondicerianus*), Dove and Humming Bird.
- Planting will be undertaken to enhance biodiversity and conserve the integrity of existing habitats.

Topsoil Management

- Appropriate sediment controls will be installed at the base of stockpiles to prevent soil loss
- Weed growth will be monitored and subsequently controlled, if necessary.
- Prior to re-spreading, weed growth will be scalped from the top of the stockpiles to minimize the transport of weeds into rehabilitated areas

Management of Remnant Vegetation

- The remnant vegetation present within the consent area will be managed during the life of the project to maintain its ecological values and promote biodiversity
- Strategies include management of grazing impacts, weeds, feral animal control, erosion, sediment control and encouragement of natural regeneration

- One of the aims of remnant vegetation management is to improve connectivity of remnant vegetation patches within the consent area to provide improved habitat corridor function
- Annual inspections of remnant areas will be undertaken by qualified persons to identify any weed or feral animal issues, identify any areas affected by erosion and to assess the extent of natural regeneration occurring. Actions will be taken to address any issues identified

Landscape Management

- The site is to be maintained in a weed free condition and any newly planted trees or shrubs which die, or are destroyed, within 24 months of mine closure shall be replaced in the appropriate season with plants of the same species
- Existing mature trees are to be inspected once annually by a suitably qualified contractor and any arboricultural works are to be carried out accordingly
- Shrub bed areas shall be maintained as bare earth and kept free from weed growth, litter and rubbish at all times. Any shrubs overhanging pedestrian routes or adjacent grassed areas are to be pruned back.
- Pruning of ornamental shrubs should be done to encourage healthy and bushy growth and promote desirable ornamental features, e.g. flowers, fruit, autumn color, stem color.
- Smooth flowing curves of edges with adjacent shrub areas to be left neat and well defined.

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|---------------------------|--|
| <i>Monitoring</i> | Monitoring will be undertaken by the HSE Manager throughout the project life. Monitoring of planting and seeding will be undertaken for 5 years after completion of project. |
| <i>Emergency Measures</i> | Environmental Coordinator to be informed immediately if any adverse impact to habitat occurs in the project proximity which is set aside for operation of the project |

8.5 Training and Capacity Building

Training and capacity building trainings are conducted on the regular basis to enhance the capacity of the workers hired for the working. Following is the detailed plan along with the schedules of the training:

Table 23: Training and Capacity Building Plan

| Training and Capacity Building Plan | |
|-------------------------------------|---|
| Potential Impacts | Operation Phase |
| | <p>➤</p> <p>During operational phase, nearby society will face problems like:</p> <ul style="list-style-type: none"> Noise Pollution due to processing and movement of vehicles Disease vector production due to improper management of solid waste Contamination of ground water if the wastewater is not disposed off properly HSE issues may arise |
| Mitigation | Training and Capacity Building Plan |

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| | | | |
|------------------------|---|-------------------------------|----------------------------|
| Management Plan | Training and Capacity Building Plan Project will ensure in-house training for the project staff and the supervisory staff of the Proponent/EA through the provision of one day basic training and one day advanced training, covering environmental and social aspects of the projects in general, and implementation requirements will emphasis on the development projects in general, and implementation requirements with emphasis on the roles and responsibilities of the staff and the labour while executing the environmental monitoring plan in particular. The training protocols will include the following aspects: <ul style="list-style-type: none"> Procedures for monitoring water quality parameters and measures to | | |
| | <ul style="list-style-type: none"> be adopted for avoiding or minimizing water pollution, particularly from the wastewater effluent generated from municipal uses and in the process activity Safe solid and process waste disposal practices Safety measures against hazards for workforce and the local communities arising from the construction activities Use of safety gadgets by the workforce Training for the use of PPEs | | |
| Monitoring | Responsibility | Responsible | Monitoring Duration |
| | Training of staff, vehicle operators and labour | Project Manager / HSE Manager | 1-day training once a year |

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8.6 Impacts and their Mitigation Summary

Environmental and social impacts have been identified for the process of fertilizer processing; their impacts had been mitigation by adopting required measures as recommended in EMMP of this EIA Report within the Project Area of Influence. The major impacts on physical, biological and social environment are described as under:

Table 24: Impacts Summary of fertilizer Processing

| Environmental Parameters | Impact Assessment during operational Phase |
|--------------------------------|--|
| | Operational |
| A: Physical | |
| Land Resources | |
| Soil Erosion and Contamination | 0 |
| Transportation | -1t |
| Solid Waste and By-Products | -2p |
| Land Use | NA |
| Air Resources | |
| Noise Pollution | -1t |
| Air Pollution | -1t |
| Dust Emissions | -1t |
| Water Resources | |

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| | |
|------------------------------------|-----|
| Ground Water | -1p |
| Surface Water | NA |
| Wastewater | -2p |
| B : Ecological | |
| Flora | |
| Tree Cutting | +1p |
| Fauna | |
| Terrestrial Fauna | +1p |
| C: Socio-Economic | |
| Employment Opportunities | +3p |
| Land Value Appreciation | +2t |
| Availability of Local Raw-Material | +2p |
| Economic Uplift | +3p |
| D: Hazards | |
| Physical Hazards | -1p |
| Chemical Hazards | -1p |
| Health and Safety | -1p |

Legends: 1= Low; 2= Medium; 3= High; 4= Extremely High; NA= Not Applicable; t= Temporary; p= Permanent; app= Applicable; 0= Negligible

8.7 Equipment Maintenance Details

The Client and Contractor will be responsible to maintain equipment with higher efficiency and in good working conditions. The equipment will be maintained twice a year as well as monthly inspection will be done on the regular basis to keep the process going without any interruption.

8.8 Environmental Budget

The environmental budget for the project is PKR 5 lacs which will be used for the control of the air pollution by the installation of dust collection system, tree plantation at various designated sites, EMMP for the operational phase and monitoring of environmental parameters (such as ambient air, noise and wastewater). The total cost of the project is PKR 50 Million. EMMP and the monitoring will be carried out on the regular basis. So, more than 1% of the total project cost will be allocated for the environmental protection.

9 CONCLUSION AND RECOMMENDATIONS

The findings of EIA Report showed that although the fertilizer processing is expected to have significant negative impacts on the environment during the construction and operational phases, but the severity of these adverse impacts can be reduced significantly by adopting the suggested mitigation measures in EMMP with true spirit. Moreover, their severity can be further reduced by adopting relative mitigation measures as proposed in the Chapter 7 of this EIA Report. The impacts were assessed by frequent site visits, studying related projects and by reviewing relevant documents. Generally, the project is planned to follow efficient environmental management systems. Specific environmental and social benefits have been mentioned below which depend on the proper application of mitigation measures suggested in EMMP and best engineering practices.

9.1 Merits and Demerits

The major positive impacts include;

- ⊙ Increased job opportunities,
- ⊙ Business opportunities,
- ⊙ Availability of the local fertilizer
- ⊙ Environmental enhancement through tree planation.

The project will raise the income of the persons directly associated with project as well as it will also improve the socio-economic status of the area. The project is expected to stimulate the local economies of the community as the majority of the people living in the nearby areas are associated with the labor related activities.

In general, potential adverse environmental effects resulting from the proposed activities will be temporary in nature, short-term and of low magnitude. Through application of standards, recommended mitigation measures, adherence to applicable permit conditions and regulations, adverse impacts can be effectively minimized. The project is not likely

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to have significant adverse environmental impacts which cannot be mitigated. Negligible negative impacts that are likely occur during fertilizers processing includes; air pollution due to movements of vehicles, removal of bushes and shrubs, potential impact to the local water resources and social impacts may affect the locals residing in the nearby community can be foreseen. Mitigation measures will be implemented to minimize environmental impacts though they are still negligible. There are certain mitigations suggested to cater for the aforesaid issues.

9.2 Recommendations

The intensity and severity of impacts occurred due to the Fertilizer processing varies with change in the nature and magnitude of the project as well as depends upon the baseline environmental conditions of the area. The mitigation measures will require constant information flow and consultation with the stakeholders to ensure the least adverse social-economic impact to outweigh the “no project development” scenario.

- ⇒ The adverse environmental impacts can be reduced significantly by adopting best management and monitoring practices as well as by implementation EMMP with true spirit
- ⇒ Proper PPEs including aprons, rubber gloves and shoes should be provided to workers
- ⇒ No compromise on public health and environment should be allowed
- ⇒ Waste minimization practices should be introduced to workers by conducting lectures on spot to aware the workers about the long-term benefits of the same in lieu of surrounding environment
- ⇒ A proper tree plantation plan should also be developed in order to make the process environment friendly
- ⇒ Small domestic waste storage bins should be placed at different locations for proper collection and disposal of the solid waste
- ⇒ It is recommended that the Proponent should obtain an Environmental Approval (NOC) from the Punjab-EPA before proceeding further

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File Tracking No.**CHECKLIST (EIA)****PAK EPA GUIDELINES FOR PREPARATION AND REVIEW OF ENVIRONMENTAL
REPORTS, 1997**

| Required Content | EIA Report | | |
|---|-------------|---------------------|---------|
| | PAGE NO. | REMARKS (If Any) | LACKING |
| Executive summary: | | | |
| 1. Title and location of project | 01 | | |
| 2. Name of the proponent | 02 | | |
| 3. Name of the organization preparing the report | 02 | | |
| 4. A brief outline of the proposal (type, process, technology and land requirement) | 01 | | |
| 5. The major impacts | 02 | | |
| 6. Recommendations for mitigation measures | 04 | | |
| 7. Proposed monitoring | 03 | | |
| Introduction: | | | |
| 1. Purpose of report | 26 | | |
| 2. Identification of project and proponent | 23 | | |
| 3. Details of consultant | 24 | | |
| 4. Brief description of nature, size, and location of project | 19 | | |
| Screening: | | | |
| Whether the Project requires IEE or EIA as | 27 | | |

CENTRAL ENVIRONMENTAL SERVICES (PVT) LIMITEDOFFICE NO.11, SF, CENTRE POINT PLAZA, MAIN BOULEVARD, GULBERG, LAHORE
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| | | | |
|--|----|--|--|
| per Regulations | | | |
| Scoping | | | |
| 1. Spatial and Temporal Boundaries of Environmental Assessment | 27 | | |
| 2. Important issues and concerns raised during consultation | 28 | | |
| 3. Significant impacts and factors to be determined | 29 | | |
| Consideration of Alternatives | | | |
| 1. Site alternatives, their selection and rejection criteria | 29 | | |
| 2. Design/Technology alternatives, their selection and rejection criteria | 30 | | |
| 3. Environmental Alternatives, their selection and rejection criteria | 30 | | |
| 4. Economic Alternatives, their selection and rejection criteria | 31 | | |
| Description of the project: | | | |
| 1. Objectives of Project | 31 | | |
| 2. Location and Site Layout of the project (May be annexed at the end of report) | 31 | | |
| 3. Land use on the site | 32 | | |
| 4. Road access | 32 | | |
| 5. Vegetation features of the site | 33 | | |
| 6. Cost and Magnitude of operation | 42 | | |
| 7. Schedule of implementation | 43 | | |

| | | | |
|---|----|---|--|
| 8. Description of the project (Process flow chart/steps, Technology, Raw material and products, by-products) | 34 | | |
| 9. Restoration and rehabilitation plans | 43 | | |
| Description of Environment: Clear-cut picture of existing environmental resources: | | | |
| 1. Baseline Physical Environment | 47 | | |
| 2. Baseline Ecological Environment | 54 | | |
| 3. Baseline Socioeconomic Environment | 55 | | |
| 4. Lab reports of environmental analyses (along with soil tests, geo- investigation in case of building projects and industries) | -- | Attached as Annexure with already submitted report | |
| 5. Suitability of the site (not prohibited, environmentally sensitive, incompatible to surroundings and unsuitable) | 59 | | |
| Impact Assessment | | | |
| 1. Methodologies for impact identifications (One/more) | | | |
| ✓ Checklists | 75 | | |
| ✓ Matrices | 79 | | |
| ✓ Networks | | | |
| ✓ Overlays | | | |

ENVIRONMENTAL IMPACT ASSESSMENT

**AGRICON SERVICES PAKISTAN
MANDI BAHAUDDIN**

| | | | |
|---|-----|--|--|
| ✓ GIS and Computer expert systems | 23 | Project Site Analysis has been through Google Earth. | |
| 2. Characteristics of impacts (nature, magnitude, extent and location, timing, duration, reversibility, risk) | 70 | | |
| Screening of potential Environmental Impacts and mitigation measures on/during: | | | |
| 1. Project location | 84 | | |
| 2. Design | 84 | | |
| 3. Construction phase | 87 | | |
| 4. Operational phase | 91 | | |
| 5. Potential Environmental Enhancement Measures | 96 | | |
| Environmental management and monitoring program | | | |
| i. Description of proposed mitigation actions along with: | 99 | | |
| ii. Schedule for implementation and Environmental budget | 123 | | |
| iii. Environmental Management Team along with their Roles and responsibilities (by name or position) | 101 | | |
| iv. Proposed monitoring program to assess performance or output of EMP | 119 | | |

CENTRAL ENVIRONMENTAL SERVICES (PVT) LIMITED

OFFICE NO.11, SF, CENTRE POINT PLAZA, MAIN BOULEVARD, GULBERG, LAHORE

CONTACT 0303-4342303

| v. Proposed EMP reporting and reviewing procedures | 101 | | |
|---|------------|---|---------|
| vi. Any training needs required to ensure implementation of EMP and Monitoring plans | 119 | | |
| Required Content | EIA Report | | |
| | PAGE NO. | REMARKS (If Any) | LACKING |
| | | | |
| Stakeholders Consultation: Communicate the possible impacts and concerns to the following to assist further analysis and decision making: | | | |
| i. Proponent's Environment Management Team | 102 | Will be appointed when operation of project will start | |
| ii. The responsible authority | | EPA | |
| iii. Other departments and agencies | | Livestock Departments, Forest Departments, Agricultural Departments, etc. | |
| iv. Environmental practitioners and experts | | Educational Institutes, Lawyers and NGOs. | |
| v. Affected and wider community | | General Public of the Area | |
| Appendices | | | |
| 1. Glossary | 13 | | |
| 2. List of abbreviations | 14 | | |

| | | | |
|---|----|---|--|
| 3. Lists of individuals and organizations consulted along with their written feedback | 67 | | |
| 4. Sources of data and a full list of all reference material used | | Social Surveys, proponent | |
| 5. Terms of references of environmental reports and those given to individual specialists | | Attached as annexure | |
| 6. List of names, qualifications and roles of team members carrying out the IEE/EIA study | 25 | | |
| 7. Approvals from other concerned departments | | Will be provided after obtaining NOC from EPA | |