

F-168(5A)-23

**ENVIRONMENTAL IMPACT
ASSESSMENT REPORT (EIAR)**

**M/S MARYAM FATIMA ENTERPRISES
[FAT MELTING & PROTEIN RECOVERY UNIT]**



**Muhammad Qasim
Proponent**

M/S MARYAM FATIMA ENTERPRISES

Chak 285/TDA, Chowk Azam
Tehsil and District Layyah

Final Report
(June 2023)

Prepared by

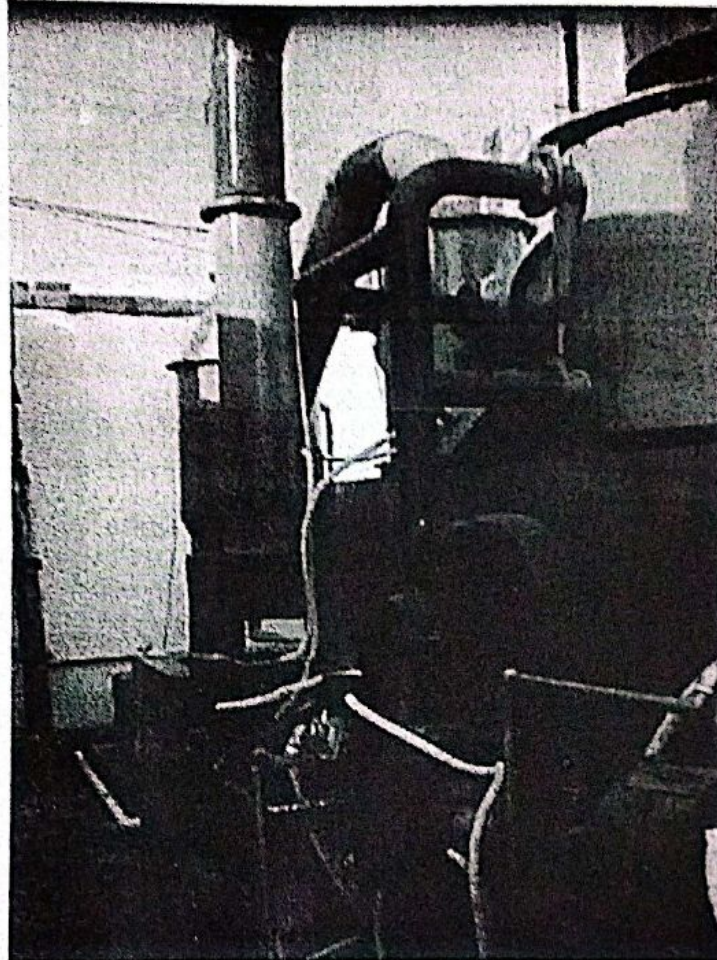


GREEN REVOLUTION

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ACKNOWLEDGMENT & DISCLAIMER

Acknowledgement

The Team of Professionals and Associates, who carried out this Environmental Impact Assessment (EIA) are thankful to the sponsor, planner, designer, architect and contractor of the plant as well as all those persons, who helped directly and indirectly in conducting this EIA in the best professional manner. The report presents a comprehensive examination of the likely environmental and social impacts of construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]". The plant will be setup on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah. The Team of Environmental Experts and Allied Professionals expresses its special gratitude for Mr. Muhammad Qasim, Owner/Proprietor and Mr. Muhammad Boota, Director, Maryam Fatima Enterprises Layyah for the assistance provided by them in connection with visits of the site during the course of the EIA. The Team is indebted deeply to Mr. Muhammad Arshad, Assistant Director (Env) Layyah and his office staff for their assistance, guidance, advice and invaluable contributions, which helped in accomplishing EIA, the way it ought to have been.

Disclaimer

This document is an Environmental Impact Assessment Report (EIAR) of the project, construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]". The report presents a detailed examination of the most likely environmental and social impacts of setting-up of the plant's building on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah. The report presents a review of the most likely environmental impacts of setting up of the project, as may occur to the existing environmental and social profile of the site/area. For the purpose of environmental impact evaluation, a concentric area of the radius upto 100 metres from the centre of the site was assumed to be the likely zone of environmental influence of the site/activities. The prevailing baseline environmental and social profile of the site/area was used as the benchmark for assessing the changes therein, if any, and the environmental and social impacts of setting-up of the plant.

This EIA report is project specific and of limited applicability and liability only to the extent of the activities and the operations relating to setting up of the instant plant and its operation subsequent thereto and none else. The report has been prepared in compliance to directions of the EPA-Pb.

All rights of this report are reserved with the proponent and the environmental consultant. No part of this report may be reproduced, copied, published, transcribed or cited in any manner in a context different from the purpose for which it has been prepared, except with prior permission of the proponent and the authoring consultant.

Team of Environmental Experts

The team of experts, who carried out the instant EIA, comprised the following Members:

- Engr. Mukhtar A Khan (Civil Engineer & Design Specialist)
- Engr. Jamshed Yaqub (Chemical Engineer)
- Gulbaz Ali Khan (Environmental Ecologist)
- Muhammad Azeem (Environmental & Resettlement Specialist)
- Khurram Jameel (Environmental Geologist)
- Miss Saira Irum (Environmental Sociologist)
- Mr. Kashif Ikram (Environmental Lawyer)

**ABBREVIATIONS**

Acronym	Full Text
BHU	Basic Health Unit
BOD	Biochemical Oxygen Demand
COD	Chemical Oxygen Demand
dB	Decibel
DHQH	District Headquarters Hospital
ESRMP	Environmental, Social & Risk Management Plan
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
EMP	Environmental Management Plan
EPA-Pb	Environmental Protection Agency, Punjab
EPD	Environment Protection Department
ERS	Emergency Response System
ESH	Environmental Safety and Health
ESHU	Environmental Safety and Health Unit
GoPb	Government of the Punjab
GoPk	Government of Pakistan
IEE	Initial Environmental Examination
IEER	Initial Environmental Examination Report
IWT	Indus Water Treaty
JICA	Japan International Cooperation Agency
MCH	Mother and Child Healthcare Centre
NEQS	National Environmental Quality Standards
NOC	No Objection Certificate
Pak EPA	Pakistan Environmental Protection Agency
PEPA	Punjab Environmental Protection Act
PM	Particulate Matter
PSDP	Public Sector Development Programme
RHC	Rural Health Centre
SHC	Sub Health Centre
SPM	Suspended Particulate Matter
SW	Solid Waste(s)
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UBC	Uniform Building Code
WAPDA	Water and Power Development Authority
WHO	World Health Organization

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EPA'S GUIDELINE PROFORMA CHECKLIST



EPA'S GUIDELINE PROFORMA & CHECKLIST FOR IEE/EIA REPORTS

GUIDELINES FOR PREPARATION AND REVIEW OF ENVIRONMENTAL REPORTS CHECKLIST

Clause No.	Requirements for Preparation and Review of Environmental Reports	IEE/EIA Report		
		Present	Lacking	Page No. (if Present)
2	Commencing Environmental Assessment			
2.3	Format of Report: Report should contain:	Yes	No	Page a to i
2.3 (A)	Executive Summary, which should contain:	Yes	No	Page a
	1. Title and Location of Project	Yes	No	Page a
	2. Name of the Proponent	Yes	No	Page a
	3. Name of the Organization preparing the Report	Yes	No	Page a
	4. A brief Outline of the Proposal	Yes	No	Page a
	5. The Major Impacts	Yes	No	Page c
	6. Recommendations for Mitigation Measures	Yes	No	Page g
2.3(B)	7. Proposed Monitoring	Yes	No	Page h
	Introduction should include:	Yes	No	Page 1-4
	1. Purpose of Report	Yes	No	Page 1
	2. Identification of Project and Proponent	Yes	No	Page 1
	3. Details of Consultant	Yes	No	Page 1
2.3(C)	4. Brief Description of Nature, Size, and Location of Project	Yes	No	Page 2
	Description of the Project should include:	Yes	No	Page 5-31
	1. Type and Category of Project	Yes	No	Page 5
	2. Objectives of Project	Yes	No	Page 5
	3. Alternatives Considered Realistically (in detailed) and Reason for Their Rejection	Yes	No	Page 5
	4. Location and Site Layout of the Project (may be annexed at the end of Report)	Yes	No	Page 6
	5. Land Use of the Site	Yes	No	Page 11
	6. Road Access	Yes	No	Page 11
	7. Vegetation Features of the Site	Yes	No	Page 11
	8. Cost and Magnitude of Operation	Yes	No	Page 11
	9. Schedule of Implementation	Yes	No	Page 11
	10. Description of the Project (Process Flow Chart/Steps)	Yes	No	Page 12
	11. Restoration and Rehabilitation Plans	NR	No	Page 30
	12. Government Approvals	NR	No	Page 31
2.3(D)	Description of Environment should include:	Yes	No	Page 32-50
	1. Clear-cut Picture of Existing Environmental Resources:	Yes	No	Page 32-40
	▪ Physical			
	▪ Ecological			
2.3(E)	▪ Socioeconomic			
	2. Quality of Life Values	Yes	No	Page 32-40
	3. Lab Reports of Environmental Analyses	NR	No	Page 49
	Screening of Potential Environmental Impacts and Mitigation Measures should include Environmental Parameters regarding:	Yes	No	Page 51-7
	1. Project Location	Yes	No	Page 52
	2. Design	Yes	No	Page 52
2.3(F)	3. During Construction Phase	Yes	No	Page 53
	4. During Operational Phase	Yes	No	Page 58
	5. Potential Environmental Enhancement Measures	Yes	No	Page 67
	Environmental Management and Monitoring Programme	Yes	No	Page 73-8



	should include:			
	▪ Institutional Capacity	Yes	No	Page 73
	▪ Training Schedules	Yes	No	Page 74
	▪ Summary of Impacts and Their Mitigation Measures	Yes	No	Page 74
	▪ Equipment Maintenance Details	Yes	No	Page 75
	▪ Environmental Budget	Yes	No	Page 75
2.5	Involvement of Stakeholders/Public Consultation: Communicate the Possible Impacts and Concerns to Assist further Analysis and Decision Making	Yes	No	Page 83-86
	▪ Proponent	Yes	No	Page 83-86
	▪ The Responsible Authority	Yes	No	Page 83-86
	▪ Other Departments and Agencies	Yes	No	Page 83-86
	▪ Environmental Practitioners and Experts	Yes	No	Page 83-86
	▪ Affected and Wider Community	Yes	No	Page 83-86
2.7	Site Selection should Include: Suitability of the Site (will not be Prohibited, Environmentally Sensitive, Incompatible to Surroundings and Unsuitable)	Yes	No	Page 83-86
3	Assessing Impacts (For EIA only)			
3.2	Identification of all Impacts	Yes	No	Page 51-72
3.2	Methodologies for Impact Identifications (One/More)	Yes	No	Page 68-81
Table 2	▪ Checklists	Yes	No	Page 70-71
	▪ Matrices	Yes	No	Page 68-69
	▪ Networks	NR	No	Page 76-81
	▪ Overlays	NR	No	
	▪ GIS and Computer Expert Systems	NR	No	
3.3	Impact Analysis and Prediction (One/More)	Yes	No	Page 83-86
and 3.6	▪ Meetings	Yes	No	-do-
	▪ Workshops	Yes	No	-do-
	▪ Consultations / Case Studies	Yes	No	-do-
3.5	Characteristics of Impacts (Nature, Magnitude, Extent and Location, Timing, Duration, Reversibility, Risk)	Yes	No	Page 51-72
3.10	Impact Significance: Acceptable, Require Mitigation or are Unacceptable to the Community	Yes	No	-do-
	▪ Ecological Importance	Yes	No	-do-
	▪ Social Importance	Yes	No	-do-
	▪ Environmental Standards	Yes	No	-do-
4	Mitigation and Impact Assessment			
	Purpose of Mitigation Measures should include:	Yes	No	Page 51-72
4.1	1. What is the Problem	Yes	No	-do-
	2. When will Problem will occur and when it should be addressed	Yes	No	-do-
	3. Where Problem should be addressed	Yes	No	-do-
	4. How the Problem should be addressed	Yes	No	-do-
4.2	Ways of Achieving Mitigation Measures	Yes	No	-do-
	▪ Changing in Planning and Design	Yes	No	-do-
	▪ Improved Monitoring and Management Practices	Yes	No	-do-
	▪ Compensation in Money Terms	Yes	No	-do-
	▪ Replacement, Relocation and Rehabilitation	Yes	No	-do-
4.3	Prepare an Environmental Management Plan	Yes	No	Page 73-82
5	Reporting			
5.1	Clear Reporting Style supported by Maps or other Descriptive Details	Yes	No	Yes
5.2	Specific Term of References should be present in Report	Yes	No	Page 102
5.3	1. Appendices	Yes	No	Pg 89-102
	2. Glossary	Yes	No	Page xxii
	3. List of Abbreviations	Yes	No	Page xxii
	4. Lists of Individuals and Organizations Consulted alongwith their Written Feedback	Yes	No	Page 100



	5. Sources of data and a full list of all reference material used	Yes	No	Page 88
	6. Terms of References of Environmental Reports and those given to Individual Specialists	Yes	No	Page 102
	7. List of Names, Qualifications and Roles of Team Members carrying out the IEE/EIA	Yes	No	Page xxi

Clause No. 2: Commencing Environmental Assessment

The Punjab Environmental Protection Act 1997 prescribes two broader categories of evaluation of the environmental impacts of a project. These are:

- Initial Environmental Examination, abbreviated as IEE, and
- Environmental Impact Assessment, abbreviated as EIA

Both categories of environmental appraisals have been defined in the following words in the Punjab Environmental Protection Act:

"Initial Environmental Examination" means a preliminary environmental review of the reasonably foreseeable qualitative and quantitative impacts on the environment of a proposed project to determine whether it is likely to cause an adverse environmental effect for requiring preparation of an environmental impact assessment.

"Environmental Impact Assessment" means an environmental study comprising collection of data, prediction of qualitative and quantitative impacts, comparison of alternatives, evaluation of preventive, mitigatory and compensatory measures, formulation of environmental management and training plans and monitoring arrangements, and framing of recommendations and such other components as may be prescribed.

The first step towards evaluation and appraisal of the probable, potential or the likely environmental impacts of an activity or a project is to determine and find out as to what type of environmental appraisal is required for a particular project. That is to say whether the project warrants an initial environmental examination (IEE) or a comprehensive and in-depth environmental impact assessment (EIA) or none. In this regard, the Regulations named, "Pakistan Environmental Protection Agency (Review of IEE/EIA) Regulations 2022" provide a guideline as to whether the project would require IEE or EIA. Schedule-I of the said Regulations contains a list of the projects requiring IEE. Similarly, Schedule-II contains a list of the projects requiring EIA. There are number of projects that will not require either an IEE or an EIA at all. The provisions with regard to such like projects are contained in Regulation 5 of the IEE/EIA Regulations 2022. According to the said provision, the Environmental Protection Agency Punjab (EPA-Pb), on the written recommendations of the Environmental Assessment Advisory Committee, may ask for environmental appraisal (IEE/EIA) required for a particular project. However, this determination will be based on a scientific, objective and rational criterion and not on whims, wishes and discretion of the officers of the EPA-Pb.

It is noticeable that setting-up of a unit for fat melting [tallow making] and recovery of protein, owing to the nature of its process operations would resemble a unit for the processing of poultry wastes. Hence, by implication i.e., if protein recovery is taken as equivalent to rendering, then the project may fall under Sr. No.9 of Category-B of Schedule-II of the IEE/EIA Regulations 2022. Viewing from this angle, the project may qualify for an EIA. Therefore, in accordance with the said Regulations and on the insistence of the Environmental Protection Agency Punjab (EPA-Pb), the proponent has filed the instant EIAR, as required under the law, rules or regulations to seek prior approval of the EPA-Pb. It needs no reiteration that if the project is constructed and operated by following the sound engineering and management practices and is fitted with appropriate and efficient pollution control equipment and systems, then its construction as well as operation will be devoid of any challenging environmental impacts, provided the plant is fitted with appropriate pollution control equipment.

Clause 2.3

Format of the Report

Generally, the format of an IEE/EIA is either project specific or area specific or a combination of both. The instant project simply is construction of a Fat Melting & Protein Recovery Unit. The building will be constructed on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah. Keeping in view the nature, scope and extent of the activities relating to setting-up of the plant on a vacant land, the instant EIAR has been prepared according to the combination format. The baseline environmental conditions, which provide the comparative basis to review and ascertain the extent of the likely environmental impacts of an activity or a project, have been described according to this format approach. The Section on baseline environmental portfolio contains a detailed description of the baseline characteristics of the area and of the district of the project, wherever relevant.



Apart from other pertinent aspects, the EIAR provides an insight into the likely environmental and social impacts of setting-up of the plant by adjudging them against the standard environmental and social impact assessment guidelines, rules and regulations of the Government of the Punjab as well as other international organizations (like the World Bank, WHO etc.). Format of the report, to the extent possible, is in consonance with the prevailing international best practices in the field of environmental examination and assessment and also in line with the checklist guidelines of the EPA.

In preparing this EIA, reliance has been placed primarily on the data and information provided by the proponent and obtained from other agencies and depths of Government of the Punjab. However, wherever required and found relevant, additional data and information has been gathered through various reliable sources including visits of the site by the Team of Experts in order to evaluate the impacts with relation to geographical and social contexts of setting-up of the plant.

The format and mode of the environmental impact examination/assessment has been kept, as far as practicable, in conformity with the national and international practices in the field of IEE/EIA. The report contains a detailed examination of the essential baseline conditions, likely or foreseeable disturbances/impacts to those conditions, and the mitigation measures/recommendations regarding the environmental impacts, both during construction and during subsequent operation phase of the plant. This, of course, included evaluation, both of the potential and the actual positive or negative impacts, on the physical (tangible) & abstract (non-tangible) environments. The report covers all aspects of construction and operation of the plant including civil, mechanical, electrical-works and the array of other pertinent activities. Reliance has been placed on the following sources of data and information in preparing the instant EIA Report:

1. Environmental Guidelines for Selected Infrastructure Projects, Office of the Environment, World Development Bank, 1993
2. Environmental Impact Assessment Guidelines, Government of Pakistan, Ministry of Housing & Urban Affairs, (Environment & Urban Affairs Division 1986)
3. Guidance for Implementing the Environmental Impact Assessment (EIA) Process, Central Environmental Authority, Ministry of Forestry & Environment, Government of Sri Lanka
4. Introduction to Environmental Impact Assessment, Principles & Procedures, Process, Practice & Prospects, John Glasson

In accordance with the above-referred sources, the EIAR comprises the following sections/subsections:

- ✓ EPA's Guideline Proforma
- ✓ Acknowledgment & Disclaimer
- ✓ Abbreviations and Acronyms used in the EIAR
- ✓ Executive Summary
- ✓ Introduction to the Project
- ✓ Brief Description of the Project and its Salient Features
- ✓ Baseline Environmental Profile of the Site/Area/District
- ✓ Radius of influence of the Site/Activities
- ✓ Examination of the likely Disturbances to the Baseline Profile
- ✓ Description & Characterization of the likely Environmental Impacts of the Project
- ✓ Measures to Avoid, Control and Mitigate the Foreseeable Environmental Impacts of the Project
- ✓ Environmental and Social Environmental Management and Risk Avoidance Strategy and Plan
- ✓ Consultations with the Important Stakeholders alongwith Outcome
- ✓ Considerations of the various Alternative Options of the Project
- ✓ Strategy, Methodology and Modalities of carrying out the EIA
- ✓ A Brief Outline of the Environmental Legal Framework and its relevance to the Project
- ✓ References, Sources and Bibliography

On account of its format, based on the above given scheme of things, the instant EIAR is fully comprehensive and contains all essential details to help the EPA-Pb to review it critically for the grant of environmental approval of the project as envisaged under the PEP Act 1997.

Clause 2.3(A)

Executive Summary, which should contain:

1.	Title and Location of the Project	Construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]". The plant will be located at Chak 285/TDA Road, District Layyah.
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EIAR: Setting-up of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]", Chak 285/TDA, Distt. Layyah
Green Revolution, 2023



		and Distt. Layyah.																										
2.	Name of the Proponent	Muhammad Qasim S/o Ghulam Hussain Proponent, R/o Ward No. 4, Mohallah Sadqabad Chowk Azam, Tehsil & District Layyah, M/S Maryam Fatima Enterprises, Chak 285/TDA Road, Tehsil and Distt. Layyah.																										
3.	Name of the Organization Preparing the Report	"Green Revolution", who are the leading environmental management consultants have prepared the EIA report in accordance with the applicable rules, regulations, guidelines and provisions of other relevant laws in vogue. Green Revolution have their Head Office at Lahore and branch offices in the Federal Capital and Provincial Capitals at Karachi, Peshawar, Quetta.																										
4.	A Brief Outline of the Proposal	The project essentially is construction of a Fat Melting & Protein Recovery Unit under the name and style, 'Maryam Fatima Enterprises'. As the name indicates, the project primarily is transformation of the unstable animal fat into stable fat [called tallow] by melting it at appropriate temperature, removing the impurities and then letting it cured at ambient temperature. The second component i.e., protein recovery is also an alike thermal process in which the discarded parts of poultry and birds are cooked in a digester at an appropriate temperature for the requisite duration of time and after removal of the excess oil and fat, are crushed into a granular proteinaceous material, which is used in the manufacturing of poultry feed. The project will be an environmentally controlled unit situated in open countryside on a hitherto vacant plot of land, owned and possessed by the proponent at Chak 285/TDA, Tehsil and District Layyah. It will be spanned over an total area of approx. 27225 Sft (5 Kanals) and bearing khewat No.6, khatooni 32 to 61 amidst open lands around. It will be situated at a distance of at least 1.5 km from the village/settlement nearest to the site. The project will be constructed as a semi-automatic plant. However, owing to its smaller size, majority operations will be done manually. Both feeding of the poultry waste and removal of the prepared product from the pressure digesters/cookers will be manual. All equipment and machinery will be installed in the production hall to be constructed anew. A detail description of the processes will follow. Salient features of the plant are given in a table form, as hereunder: <table border="1"> <thead> <tr> <th>Particulars</th> <th>Description</th> </tr> </thead> <tbody> <tr> <td>Name of the project</td> <td>Construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]".</td> </tr> <tr> <td>Location</td> <td>The plant will be located at Chak 285/TDA Road, Tehsil and Distt. 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Operational capacity	The initial operational capacity will be 500 kg (0.5 tonne) per hour, which will be gradually increased to 10,000 kg (10 tonne) per hour over lifetime of the project in line with business expansion
Road access	The site is accessible from the Layyah Section of Indus Highway (NS5) via Chak 285/TDA road. NS5 is one of the largest national highways of the country that runs parallel along the west bank of river Indus and links all major cities situated along its trajectory including Layyah. It is the principal road route for the transportation of goods and passengers between some major destinations of the country located on it. The siting of the unit at the selected site proximal to the national highway will be highly advantageous for the intended operations of the plant.
Nature of wastes	All types of municipal, commercial, domestic, industrial and other wastes including the hazardous wastes, biomedical and healthcare waste, obnoxious waste except the radiological and explosive waste
Igniting fuel	Ordinary wood will be used as the primary fuel for the steam and will be replaced with natural gas, as and when the latter would become available
Water availability	Water is available at site. Water will be stored first in an underground tank from where it will be pump lifted to an overhead tank/reservoir
Emissions and effluent control	The excess steam coming from the cookers/digesters will be collected and will be cooled down and condensate to reform into water by passing it firstly through the water tank for removing the odorous substances and then through the cooling tower to bring down its temperature to the ambient atmospheric temperature. The stack emissions from the boiler chimney will not require any pretreatment, as only good quality fuel like wood or gas will be used in the boiler. Moreover, the height of the chimney will be of the recommended height (30-35 feet) to let the warm air pass out easily. In this way, only the PEQS compliant emissions will be released to the exterior. The steam condensate will be reused and recycled in the system and excess water, if any, will be used for watering the greenbelts and tree-plantation at and around the site/premises. There will not be the generation of any surplus used-up water, as might require disposal into any nearby wastewater channel. Release of the wastewater, if there be any, will be only after making it conformant to the applicable PEQS. On account of the very nature of the process operations, there will not be the generation of any solid wastes, as might require disposal. Whatsoever little solid wastes that will be produced at the plant will be disposed of through the waste management system of the local municipality.
Power source	The main power source for the project will be the



	WAPDA mains, which will be supplemented by a standby diesel generator in case of electricity outages.
Start of operation	The operation of the plant will commence only after complete setting-up of the machinery, equipment and the pollution control system and that too under environmental approval from the EPA-Pb

Process Description

As the name indicates, the project essentially is a combined facility for tallow making and recovery of protein from poultry waste in the same machines under one roof. Hence, description of both processes has been given separately for the facility of easy understanding of the reader.

The fat melting i.e., tallow making is a process of stabilization of the pre-treated fat (i.e., pre-cooked) of animal origin. The stabilized liquid fat is used in the manufacturing of various secondary products. The proponent will collect the pre-treated fat (tallow) from various dealers in the area. In order to make it suitable for soap manufacturing, the raw animal fat is subjected to a two-step stabilization process. In the first stage, the original raw fat, as obtained from slaughtered livestock, is heated to convert it into the primary treated fat. This is done by heating and cooking the raw fat. This step will not be done at the project. The proponent will buy the already cooked fat from their respective sellers. In the second stage, the primary treated fat is converted into secondary treated fat once again through the process of heating and cooking.

The instant facility will be a secondary treatment facility where the already treated [primary treated or pre-cooked] fat will be converted into final product for usage as a raw material for the manufacturing of soap and other alike products. It may be mentioned as a passing reference that the raw animal fat, which is the principal source of the primary pre-treated fat, is obtained from the slaughtered animals, livestock and the poultry at the time of slaughtering of these animals/birds. It is first converted into the primary treated fat and then again into the secondary treated fat.

The primary objective of the project is to prepare soap grade fat oil from the precooked animal origin fat obtained from the slaughtered livestock and the poultry. The secondary objective is to provide opportunities of employment and jobs for the needy.

The fat melting [tallow] process at the project facility will consist of the following essential steps:

- ✓ Receipt of pre-cooked hardened animal fat [tallow]
- ✓ Heating and melting of fat in the melting pans of appropriate size
- ✓ Removal of impurities from the melting fat
- ✓ Packing of the processed fat [tallow] in suitable contains, usually drums

The re-cooking of the already cooked fat will be carried out in large sized open pans of 1~2 tonne capacity each. Animal fat usually becomes stabilized at a temperature of 180°C. therefore, the primary treated fat will be heated continuously at a temperature of 180°C for around 4~6 hours at normal atmospheric pressure. This will convert the primary cooked fat into a stabilized end-product, the liquified tallow. It need no mention that the impurities and the lightweight foam that scums at the top surface of liquifying fat will be removed, as and when sufficient

amount, becomes accumulated atop.

To start with, the proponent intends to install 4-6 cooking pans, 1-2 cleaning and settling tanks and 2-4 finished product storage tanks. However, number of these may be increased or decreased depending on market response and other factors. All the tanks will be made of the ordinary steel sheets of appropriate thickness.

As mentioned above, the project will start initially with 4-6 pans of 1 tonne capacity each. Thus, the production capacity @ 1 tonne of fat oil per pan will be 4-6 tonne per batch of 8 hours. Therefore, the combined daily production capacity of all three batches will be 12-18 tonnes of fat oil. In this manner, the annual production, after deducting the idle time of maintenance, leaves and non-operation days, the annual production capacity will be 3,360 to 5040 tonnes against the industrial year of 280 days. However, this assumed production capacity may increase or decrease depending on the number of the operational fat cooking or melting pans.

In the protein recovery process, protein compounds will be recovered from discarded parts of the slaughtered poultry through the process of pressure digestion. Protein recovery will be through steam cooking digestion of the otherwise unusable poultry parts, collected from various retail poultry outlets. Cooking/digestion will be carried out in large size horizontal pressure digesters/cookers of 6-8 tonne capacity each. The process will be a batched production process of around 6 hours each with an interval of two hours, during which the poultry waste will be fed into the digesters. The process of digestion will take place at a temperature of 180°C and at a pressure of 150 lb/psi. Although, digestion will take place inside the pressure digesters, yet excess steam formed during digestion will find its way out through the safety release valve. This exhaust steam may contain some odorous compounds, hence some odour around the cooker/digester. The process will consist generally of the following steps:

- ✓ Receipt of poultry waste from their respective vendors
- ✓ Cooking of the waste in large sized cookers/digesters
- ✓ Removal of excess oil from the cooked fat by centrifuge press
- ✓ Granulation of the dry cooked cake
- ✓ Packing and storing for supplying to market

As per the information provided by the proponent, he will collect the unusable poultry waste of the slaughtered poultry from various poultry meat selling outlets of the area in closed containers. The collection containers will be brought to the project site in appropriate carriage vehicles. The incoming poultry waste will be first unloaded in the receiving hall, from where it will be fed into the cookers/digesters from time to time as per requirement. Initially, feeding of the waste to digesters will be manual, which will be soon changed into conveyor belt feeding system. The recovered protein will be taken out from the cookers/digesters manually with the help of rakes. Since, the material will be still hot, it will be transferred first to the curing room, where it will be allowed to cool down to the room temperature. This process is called curing and the product that results are the fine protein granules. This will be filled into polypropylene bags of the size 50kg and 100kg and will be supplied to the market in these bags. The steam that will be used for cooking/digesting the waste material will be recirculated after cooling it down in the cooling tower. The water loss resulting from natural evaporation during steam condensation and recirculation will be replenished by adding additional freshwater into the system.



In order to control the odour during cooking/digestion, the steam coming out of the cookers/digesters will be let to pass through water. For this purpose, a water tank will be constructed for letting the steam pass through it. The water will act as the odour absorbent material. Furthermore, the digesters will be installed deep inside the production hall so that any steam coming out from them does not find way to outer environment except to pass through the water seal and then to be discharged to the exterior through the chimney.

The only natural resource to be used during construction and operation of the project will be the freshwater, which will be used mainly for absorbing odorous steam as well as for washing the floors. Both fat melting and the protein recovery processes will neither require nor consume any other natural resources. Freshwater will be obtained through a groundwater pump, which will be installed anew before starting the construction work. Apart from some other minor uses, freshwater will be used primarily for four major activities at the facility. These uses will include: (i) as the drinking water for the labour and employees, (ii) as the primary agent for controlling odour by absorbing odorous compounds contained in the steam coming out from the pressure digesters/cookers, (iii) for making steam for the cookers/digesters, and (iv) for various other miscellaneous activities and human needs at worksite toilets and for irrigating the green areas. In order to ensure conservation in usage of water, the freshwater to be consumed in the cooling system and odour control system, will be re-circulated.

The production hall be fitted with heavy duty exhaust fans for keeping the inside temperature at a desirable level. The floors, particularly the incoming raw material receiving platform will be washed daily with water and detergent for removing dirt and grease. The washout will be drained to the septic tanks for treatment and only the treated wastewater will be discharged out.

Design and Layout of the Cooker/Digester

The proponent has not yet selected the final source for procurement of the cookers/digesters to be installed at the premises. However, the proponent intends to instal the locally fabricated machinery and equipment. Currently, the proponent is searching for the best manufacturer in order to be sure that the cookers/digesters fabricated by him are of standard specs and conform to the applicable PEQS.

Design and Layout of the Plant

The salient features of the design and layout of the plant will be as under:

- Incoming and outgoing gate with a guardroom fitted with an inventory recording system
- Parking area for the incoming carriage and personal vehicles
- Vehicle weighbridge (optional)
- Incoming raw material receiving and storage enclosure
- Cookers/digesters fitted with all essential equipment and control systems
- Cooker temperature monitoring and control system
- Steam circulation, capturing, cooling and recirculation system and equipment
- Cooked material removal and curing system
- Excess oil extraction equipment and system
- Packing, storing and dispatching system
- Onsite laboratory
- Other support equipment and facilities (e.g., generator)
- Fire safety and emergency control systems and facilities



		▪ Admn building / office rooms ▪ Green areas, grassy lawns and tree plantations The operation of the plant shall commence only after complete setting-up of the machinery, equipment and the odour control system under environmental approval from the EPA-Pb.
5.	The Major Impacts	There will not be any likely environmental impacts of setting-up (i.e., on ground construction of building and concomitant installation of machinery) of the plant. The plant building will be constructed on a vacant land on a long-term lease with the proponent. The site situated at Chak 285/TDA Road, Tehsil and Distt. Layyah. However, the operational activities of the plant could be associated with some environmental impacts, if suitable pollution control equipment is not installed or its operation is faulty. The implementation of the EMP will further ensure environmental compliance and compatibility if the plant. As regards the benefits and positive impacts, construction and operation of the plant will ensure environment friendly disposal of the solid and hazardous wastes as well as opportunities of job and employment for a fair number of persons including residents of the surrounding areas. A complete detail of the likely environmental impacts and their mitigation is given in a separate section of this EIAR.
6.	Recommendations for Mitigation Measures	The construction of the building, installation of machinery and equipment and other support components on a vacant land, owned and possessed by the proponent will be devoid of any major environmental impacts. However, the operational activities of the plant could be associated with some environmental impacts, if suitable pollution control equipment is not installed or its operation is faulty. The implementation of the EMP will further ensure environmental compliance and compatibility if the plant. As regards the benefits and positive impacts, construction and operation of the plant will ensure environment friendly disposal of the solid and hazardous wastes as well as opportunities of job and employment for a fair number of persons including residents of the surrounding areas. A complete detail of the likely environmental impacts and their mitigation is given in a separate section of this EIAR. All operations at the plant, right from receipt of the waste materials to the formation of the finished products will be devoid of any impacts on the environment provided appropriate pollution control measures are taken and the EMP is followed and the right kind of pollution control equipment is installed. Owing to installation of the requisite pollution control equipment, the operational activities at the plant will be devoid of any serious environmental impacts. However, in order to improve performance of the plant further, some good housekeeping practices including safety and cleanliness of the plant premises have been recommended. Implementation of these recommendations will enhance outlook and aesthetics of the premises.
7.	Proposed Monitoring	In order to ensure conformance to applicable environmental quality standards, a robust monitoring regime has been proposed for the entire operational life of the plant. In order to ensure infallibility and optimal quality of monitoring; formulation of a smart and efficient Environmental Safety & Monitoring Unit (ESMU) has been proposed. The ESMU will be headed by a qualified person having due knowledge of the subject and worksite environmental safety. In addition to regular and round the clock internal monitoring by the ESMU, an agreement will be made with "Green Revolution" for a long term and regular annual as well as periodic external environmental audits, inspections and monitoring regime. The monitoring reports, both of the internal as well as of the external audits, will be submitted to the concerned quarters, if, so and when desired.

Clause 2.3(B)

**Introduction should include:**

1.	Purpose of the Report	To make a preliminary environmental review and assessment of the reasonably foreseeable qualitative and quantitative impacts on the environment, if any, regarding setting-up of the plant on a vacant land, owned and possessed by the proponent. Further to determine whether setting-up of the plant will cause or is likely to cause any adverse environmental effects, if any.																										
2.	Identification of the Project and Proponent	Project: Construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]" Proponent: Muhammad Qasim S/o Ghulam Hussain Proponent, R/o Ward No. 4, Mohallah Sadiqabad Chowk Azam, Tehsil & District Layyah, M/S Maryam Fatima Enterprises. The plant will be located at Chak 285/TDA Road, Tehsil and Distt. Layyah".																										
3.	Details of the Consultant	M/s Green Revolution, who are the leading environmental management consultants have performed as the accredited environmental consultants of the project. Green Revolution have their Head Office at Lahore and branch offices in the Federal Capital and all Provincial Capitals of Karachi, Peshawar and Quetta																										
4.	Brief Description of Nature, Size and Location of Project	The project essentially is construction of a Fat Melting & Protein Recovery Unit under the name and style, 'Maryam Fatima Enterprises". As the name indicates, the project primarily is transformation of the unstable animal fat into stable fat [called tallow] by melting it at appropriate temperature, removing the impurities and then letting it solidify at ambient temperature. The second component i.e., protein recovery is also an alike thermal process in which the discarded parts of poultry and birds are cooked in a digester at an appropriate temperature for the requisite duration of time and after removal of the excess oil and fat, are crushed into a granular proteinaceous material, which is used in the manufacturing of poultry feed. The project will be an environmentally controlled unit situated in open countryside on a hitherto vacant plot of land, owned and possessed by the proponent at Chak 285/TDA, Tehsil and District Layyah. It will be spanned over an area of approx. 27225 Sft bearing khewat No.6, khatooni 32 to 61 amidst open lands around. It will be situated at a distance of at least 1.5 km from the village/settlement nearest to the site. The project will be constructed as a semi-automatic plant. However, owing to its smaller size, majority operations will be done manually. Both feeding of the poultry waste and removal of the prepared product from the pressure digesters/cookers will be manual. All equipment and machinery will be installed in the production hall to be constructed anew. A detail description of the processes will follow. Salient features of the plant are given in a table form, as hereunder:																										
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	necessary equipment and gadgets
Specifications	Mild steel cookers/digesters for cooking of poultry waste and MS pans for melting of animal fat, as per manufacturer/fabricator's specifications
Temperature control	Temperature probes with screen display, monitoring and control
Installed capacity	Upto 6,000-8,000 kg (6-8 tonne) each cooker for the poultry waste and 1 tonne each pan for fat melting/tallow making
Operational capacity	The initial operational capacity will be 500 kg (0.5 tonne) per hour, which will be gradually increased to 10,000 kg (10 tonne) per hour over lifetime of the project in line with business expansion
Road access	The site is accessible from the Layyah Section of Indus Highway [N55] via Chak 285/TDA road. N55 is one of the largest national highways of the country that runs parallel along the west bank of river Indus and links all major cities situated along its trajectory including Layyah. It is the principal road route for the transportation of goods and passengers between some major destinations of the country located on it. The siting of the unit at the selected site proximal to the national highway will be highly advantageous for the intended operations of the plant.
Nature of wastes	All types of municipal, commercial, domestic, industrial and other wastes including the hazardous wastes, biomedical and healthcare waste, obnoxious waste except the radiological and explosive waste
Igniting fuel	Ordinary wood will be used as the primary fuel for the steam and will be replaced with natural gas, as and when the latter would become available
Water availability	Water is available at site. Water will be stored first in an underground tank from where it will be pump lifted to an overhead tank/reservoir
Emissions and effluent control	The excess steam coming from the cookers/digesters will be collected and will be cooled down and condensate to reform into water by passing it firstly through the water tank for removing the odorous substances and then through the cooling tower to bring down its temperature to the ambient atmospheric temperature. The stack emissions from the boiler chimney will not require any pretreatment, as only good quality fuel like wood or gas will be used in the boiler. Moreover, the height of the chimney will be of the recommended height [30-35 feet] to let the warm air pass out easily. In this way, only the PEQS compliant emissions will be released to the exterior. The steam condensate will be reused and recycled in the system and excess water, if any, will be used for watering the greenbelts and tree-plantation at and around the site/premises. There will not be the generation of any surplus used-up water, as might require disposal into any nearby wastewater channel.



	Release of the wastewater, if there be any, will be only after making it conformant to the applicable PEQS. On account of the very nature of the process operations, there will not be the generation of any solid wastes, as might require disposal. Whatsoever little solid wastes that will be produced at the plant will be disposed of through the waste management system of the local municipality.
Power source	The main power source for the project will be the WAPDA mains, which will be supplemented by a standby diesel generator in case of electricity outages.
Start of operation	The operation of the plant will commence only after complete setting-up of the machinery, equipment and the pollution control system and that too under environmental approval from the EPA-Pb
Process Description As the name indicates, the project essentially is a combined facility for tallow making and recovery of protein from poultry waste in the same machines under one roof. Hence, description of both processes has been given separately for the facility of easy understanding of the reader. The fat melting i.e., tallow making is a process of stabilization of the pre-treated fat (i.e., pre-cooked) of animal origin. The stabilized liquid fat is used in the manufacturing of various secondary products. The proponent will collect the pre-treated fat (tallow) from various dealers in the area. In order to make it suitable for soap manufacturing, the raw animal fat is subjected to a two-step stabilization process. In the first stage, the original raw fat, as obtained from slaughtered livestock, is heated to convert it into the primary treated fat. This is done by heating and cooking the raw fat. This step will not be done at the project. The proponent will buy the already cooked fat from their respective sellers. In the second stage, the primary treated fat is converted into secondary treated fat once again through the process of heating and cooking. The instant facility will be a secondary treatment facility where the already treated [primary treated or pre-cooked] fat will be converted into final product for usage as a raw material for the manufacturing of soap and other alike products. It may be mentioned as a passing reference that the raw animal fat, which is the principal source of the primary pre-treated fat, is obtained from the slaughtered animals, livestock and the poultry at the time of slaughtering of these animals/birds. It is first converted into the primary treated fat and then again into the secondary treated fat. The primary objective of the project is to prepare soap grade fat oil from the precooked animal origin fat obtained from the slaughtered livestock and the poultry. The secondary objective is to provide opportunities of employment and jobs for the needy. The fat melting [tallow] process at the project facility will consist of the following essential steps: ✓ Receipt of pre-cooked hardened animal fat [tallow] ✓ Heating and melting of fat in melting pans of appropriate size ✓ Removal of impurities from the melting fat ✓ Packing of the processed fat [tallow] in suitable contains, usually	



drums

The re-cooking of the already cooked fat will be carried out in large size open pans of 1~2 tonne capacity each. Animal fat usually become stabilized at a temperature of 180°C. therefore, the primary treated fat will be heated continuously at a temperature of 180°C for around 4~6 hours at normal atmospheric pressure. This will convert the primary cooked fat into a stabilized end-product, the liquified tallow. It need n mention that the impurities and the lightweight foam that scums at th top surface of liquifying fat will be removed, as and when sufficien amount, becomes accumulated atop.

To start with, the proponent intends to install 4-6 cooking pans, 1 cleaning and settling tanks and 2-4 finished product storage tanks. However, number of theses may be increased or decreased depending o market response and other factors. All the tanks will be made of th ordinary steel sheets of appropriate thickness.

As mentioned above, the project will start initially with 4~6 pans of : tonne capacity each. Thus, the production capacity @ 1 tonne of fat o per pan will be 4-6 tonne per batch of 8 hours. Therefore, the combin daily production capacity of all three batches will be 12~18 tonnes of fa oil. In this manner, the annual production, after deducting the idle time o maintenance, leaves and non-operation days, the annual production capacity will be 3,360 to 5040 tonnes against the industrial year of 280 days. However, this assumed production capacity may increase o decrease depending on the number of the operational fat cooking o melting pans.

In the protein recovery process, protein compounds will be recovered from discarded parts of the slaughtered poultry through the process o pressure digestion. Protein recovery will be through steam cooking digestion of the otherwise unusable poultry parts, collected from various retail poultry outlets. Cooking/digestion will be carried out in large size horizontal pressure digesters/cookers of 6~8 tonne capacity each. The process will be a batched production process of around 6 hours each with an interval of two hours, during which the poultry waste will be fed into the digesters. The process of digestion will take place at a temperature o 180°C and at a pressure of 150 lb/psi. Although, digestion will take place inside the pressure digesters, yet excess steam formed during digestion will find its way out through the safety release valve. This exhaust steam may contain some odorous compounds, hence some odour around the cooker/digester. The process will consist generally of the following steps:

- ✓ Receipt of poultry waste from their respective vendors
- ✓ Cooking of the waste in large sized cookers/digesters
- ✓ Removal of excess oil from the cooked fat by centrifuge press
- ✓ Granulation of the dry cooked cake
- ✓ Packing and storing for supplying to market

As per the information provided by the proponent, he will collect th unusable poultry waste of the slaughtered poultry from various poult meat selling outlets of the area in closed containers. The collectio containers will be brought to the project site in appropriate carriage vehicles. The incoming poultry waste will be first unloaded in th receiving hall, from where it will be fed into the cookers/digesters fro time to time as per requirement. Initially, feeding of the waste t digesters will be manual, which will be soon changed into conveyor b feeding system. The recovered protein will be taken out from th cookers/digesters manually with the help of rakes. Since, the material w



be still hot, it will be transferred first to the curing room, where it will be allowed to cool down to the room temperature. This process is called curing and the product that results are the fine protein granules. This will be filled into polypropylene bags of the size 50kg and 100kg and will be supplied to the market in these bags. The steam that will be used for cooking/digesting the waste material will be recirculated after cooling it down in the cooling tower. The water loss resulting from natural evaporation during steam condensation and recirculation will be replenished by adding additional freshwater into the system.

In order to control the odour during cooking/digestion, the steam coming out of the cookers/digesters will be let to pass through water. For this purpose, a water tank will be constructed for letting the steam pass through it. The water will act as the odour absorbent material. Furthermore, the digesters will be installed deep inside the production hall so that any steam coming out from them does not find way to outer environment except to pass through the water seal and then to be discharged to the exterior through the chimney.

The only natural resource to be used during construction and operation of the project will be the freshwater, which will be used mainly for absorbing odorous steam as well as for washing the floors. Both fat melting and the protein recovery processes will neither require nor consume any other natural resources. Freshwater will be obtained through a groundwater pump, which will be installed anew before starting the construction work. Apart from some other minor uses, freshwater will be used primarily for four major activities at the facility. These uses will include: (i) as the drinking water for the labour and employees, (ii) as the primary agent for controlling odour by absorbing odorous compounds contained in the steam coming out from the pressure digesters/cookers, (iii) for making steam for the cookers/digesters, and (iv) for various other miscellaneous activities and human needs at worksite toilets and for irrigating the green areas. In order to ensure conservation in usage of water, the freshwater to be consumed in the cooling system and odour control system, will be re-circulated.

The production hall be fitted with heavy duty exhaust fans for keeping the inside temperature at a desirable level. The floors, particularly the incoming raw material receiving platform will be washed daily with water and detergent for removing dirt and grease. The washout will be drained to the septic tanks for treatment and only the treated wastewater will be discharged out.

Design and Layout of the Cooker/Digester

The proponent has not yet selected the final source for procurement of the cookers/digesters to be installed at the premises. However, the proponent intends to instal the locally fabricated machinery and equipment. Currently, the proponent is searching for the best manufacturer in order to be sure that the cookers/digesters fabricated by him are of standard specs and conform to the applicable PEQS.

Design and Layout of the Plant

The salient features of the design and layout of the plant will be as under:

- Incoming and outgoing gate with a guardroom fitted with an inventory recording system
- Parking area for the incoming carriage and personal vehicles
- Vehicle weighbridge (optional)
- Incoming raw material receiving and storage enclosure
- Cookers/digesters fitted with all essential equipment and control



	- systems • Cooker temperature monitoring and control system • Steam circulation, capturing, cooling and recirculation system and equipment • Cooked material removal and curing system • Excess oil extraction equipment and system • Packing, storing and dispatching system • Onsite laboratory • Other support equipment and facilities (e.g., generator) • Fire safety and emergency control systems and facilities • Admn building / office rooms • Green areas, grassy lawns and tree plantations The operation of the plant shall commence only after complete setting-up of the machinery, equipment and the odour control system under environmental approval from the EPA-Pb. Nature: A plant for fat melting and protein recovery from pre-cooked animal fat and the discarded poultry waste. Size: 27225 Sft (5 Kanals) Location: The plant will be located at Chak 285/TDA Road, Tehsil and Distt. Layyah.
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Clause 2.3(C)**Description of the Project should include:**

1.	Type and Category of Project	A plant for fat melting and protein recovery from pre-cooked animal fat and the discarded poultry waste. The likely process operations indicate that the project resembles a poultry waste processing unit, as listed under Sr. No.9 of Category-B of Schedule-II of the EEE/EIA Regulation, 2022. The plant will be a non-invasive, non-intrusive and a benign unit, as it will be meant for safe, secure and efficient recovery of animal fat and recovery of poultry protein. The construction of the plant's building and installation of machinery and equipment inside the building and operation of the plant will not be associated with any serious environmental, social and health implications.
2.	Objectives of Project	The primary objective of construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]" is recovery of useful substances from the unwanted and useless animal and poultry waste, which if not managed will be hazardous for the environment, health and safety of the persons. Owing to the increasing awareness about the environmental concerns, the demand for the safe, secure and efficient disposal of all types of wastes, particularly those wastes that are likely to affect health and safety of the public, has escalated a lot and the concerned regulatory authorities are under tremendous pressure to ensure safe, secure and environment friendly disposal and management of the health-impacting wastes. Although, reliable statistics are not available in this regard, yet it can be safely inferred that generation of various types of animal and poultry wastes is on the increase and currently runs into thousands of tonnes per day. Whereas, only a fraction of it is being disposed of or treated scientifically, due to shortage or non-availability of the appropriate facilities for the purpose. It is, therefore, need of the time that construction, installation and setting up of the efficient waste recovery plants is ensured by the concerned authorities by encouraging the private sector and the entrepreneurs in this regard. Thus, looking from this perspective, the setting-up of the instant plant can be regarded as a positive step in this direction, as its construction will offer a commercially viable and environmental



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		compatible solution for the management and disposal of the ever-growing volume of the animal and the poultry wastes. Another linked objective of setting-up of the plant at this site is to help in uplifting of the socioeconomic profile of the area. The benefits that will come in the wake of setting-up of the plant will help in improving the socioeconomic conditions and lifestyle of the local populace. This can be counted as another direct benefit of setting-up of the plant here at the selected site. Similarly, impetus to commercial activities from trading in the commodities concerned with the project and creation of new opportunities of job and employment for the locals, which will come in the wake of setting-up of the plant, will be another inseparable benefit of setting-up and operation of the project. The setting-up of the plant will ensure timely and round the year availability of an efficient facility for the safe and secure disposal and recovery of the useful materials from the animal and poultry waste. The setting-up of the plant is in line with the "Environmental and Health Policy" of Government of the Punjab (GoPb), which emphasizes safe and secure disposal of wastes, particularly the health risk wastes. Viewing from this perspective, the primary objective of setting-up of the plant for the recovery of useful materials from the discarded and useless animal and poultry wastes, apart from providing the opportunities of new jobs and employment is to combat the environmental pollution through efficient management of these wastes.
3.	Alternatives Considered Realistically (in detailed) and Reason for Their Rejection	The possible alternatives to the instant project can be divided broadly into two categories, namely: - a). Technological alternatives - b). Site/location alternatives As far as technological alternatives are concerned, number of options are available. Since, the instant plant is intended for the safe disposal and recovery of useful materials from the discarded animal and poultry waste. Therefore, other alternative options no more remain relevant. Hence, consideration of other technological alternatives is neither valid nor relevant. As regards the site or location alternatives, only relevant factors need to be taken into consideration while selecting a site for the installation of such a plant. These, interalia, include availability of suitable land piece of requisite size, safe distance from the nearby population, availability of a drainage channel for disposal of wastewater (if any), and availability of utilities and amenities (like electricity, gas, water, road etc.). Looking from these aspects, the present site, owing to its location in a predominantly open countryside and away from any nearby population, is best-suited for construction of the plant. In view of this position of the matter, consideration of the site selection alternative also becomes invalid and irrelevant. It will be worthwhile to mention that the project simply is construction of a fat melting & protein recovery unit, which will be setup on a vacant land owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah. The alternatives of relocating the plant to some other site, or not to setup the plant at all at this site and or reducing / enhancing the size and magnitude of plant's operations are of no better advantage than the instant proposal. Hence, consideration of all other alternatives becomes irrelevant and of no benefit at all. Nevertheless, the following alternatives were considered concerning

		setting-up of the plant. ▪ Abandonment of construction / setting-up of the plant (No Project Alternative) ▪ Changing the magnitude and scope (Downsizing or Upsizing) ▪ Relocating the plant to some other site (Shifting to other Site) ▪ Process Modification Alternative (Technological Alternatives) All the alternatives, as listed above, even after careful consideration review and evaluation were found not a better choice than construction of the plant at the instant site on a vacant land, owned and possessed by the proponent. All the alternatives, other than setting-up of the plant at the present site, were found either costly, time-consuming, non-beneficial for the environment and or of no better advantage on any account compared to the present proposal. Hence, consideration of all the alternatives was dropped as being not warranted and not beneficial.
4.	Location and site layout of the project (may be annexed at the end of Report)	Location map, layout plan and aks shajra is appended as Annex-1
5.	Land Use of the Site	Currently, the site is a vacant land not under any useful purpose. However, if required, the proponent will ensure its land use change from the concerned regulatory authority prior to taking up construction of the plant. The proponent has marked the site for setting-up the plant here and has already informed the concerned revenue and other authorities of his intention to do so.
6.	Road Access	The site is accessible from the Layyah Section of Indus Highway [N55] via Chak 285/TDA road. N55 is one of the largest national highways of the country that runs parallel along the west bank of river Indus and links all major cities situated along its trajectory including Layyah. It is the principal road route for the transportation of goods and passengers between some major destinations of the country located on it. The siting of the unit at the selected site proximal to the national highway will be highly advantageous for the intended operations of the plant.
7.	Vegetation features of site	The site is a vacant land, owned and possessed by the proponent situated on Chak 285/TDA Road, Distt. Layyah. As such, the site is devoid of any unique vegetation features. However, the proponent would plant trees and exotic floral plants at and around the site as well as development of grassy lawns as the prime aesthetic and environment enhancement measure. The vegetation features of the site are insignificant. Being an ordinary vacant land, the site is devoid of any special or significant vegetative features. It is just an ordinary chunk of the floodplains of the Indus basin. Tree plantation will add to the scenic beauty of the site/premises.
8.	Cost and Magnitude of Operation	The tentative cost of setting-up of the plant, including the cost of land, plant, machinery, equipment and others will be less than Rs. 25.5 million. The annual operational cost is expected to be around Rs. 1.8 million. As regards the magnitude of operation, the installed capacity of the plant will be from 24 to 30 metric tonnes per day, which can be increased further by installing additional cookers/digesters, if needed. However, actual daily operational capacity will depend on the aggregate amount of waste received from various sources. If the total amount of the waste received daily will be less than the installed operational capacity, all the waste will be processed. On the other hand, if the amount of the received waste will be more than the installed operational capacity, the surplus waste will be kept in waiting and will be processed on the first opportunity.
9.	Schedule of Implementation	The machinery, equipment and the allied components of the plant will be installed and commissioned alongwith construction of civil structures and the building as a one-go activity on fast-track basis and within the



		shortest possible time. After procurement from their manufacturers, fabricators, traders, sellers and importers, all the machinery and equipment will be transported to the site on suitable carriage vehicles. After unloading, the plant machinery will be setup under supervision of expert engineers and professionals.
10.	Description of the Project (Process Flow Chart/Steps)	The process flow chart is appended as Annex-4.
11.	Restoration and Rehabilitation Plans	Not any restoration or rehabilitation plans required, mainly because of the following reasons: ▪ The machinery will be installed alongwith construction of the plant building ▪ The proponent will obtain necessary NOC regarding land use change to permissible usage ▪ The plant will be situated away from any human settlement, villages and towns ▪ There are not any vicinity houses, shops or other structures that might need to be demolished during setting-up of the plant ▪ Setting-up of the plant will not involve acquisition of any private land, as the land, held by the proponent is sufficient for setting-up of the plant ▪ There is no likelihood of displacement of any persons, as the plant will be constructed on a vacant land ▪ Setting-up of the plant will not involve displacement of any person or damage to any nearby property as none are existent within the zone of environmental influence of the site ▪ Construction of the plant will not involve cutting or removal of any trees or green plants ▪ The onsite setting-up of plant will not involve damage to any public or private infrastructure, as none are existent within the zone of environmental influence of the site ▪ Setting-up of the plant on a vacant land will not involve displacement of any persons or property. Hence, there will be neither any affected persons nor any issue of payment of compensation to them Aggressive tree plantation, development of greenbelts and grassy lawns at and around the site/premises has been recommended for improving environmental ambience and aesthetics of the premises.
12.	Government Approvals	In addition to the environmental approval, for which the instant EIAIR is being filed, not any other NOCs are relevant or required. Only the environmental approval from EPA-Pb is pending at the moment.

Clause 2.3(D)**Description of Environment should include:**

1.	Clear-cut Picture of Existing Environmental Resources	The description of the environmental resources and the socioeconomic profile of the site, area and district has been given at length in the Section on "Baseline Environmental Profile". To summarize, the physical, ecological and socioeconomic resources of the site/area are paltry, insignificant and of no relevance at all. The setting up of the plant at the selected site will not cause any imprint or disturbance to the existing environmental resources and or the baseline environmental profile.
2.	Physical	Insignificant, unimportant and paltry
3.	Ecological	Insignificant, unimportant and paltry
4.	Socioeconomic	Insignificant, unimportant and paltry
5.	Quality of life Values	The majority population near the site, area and the district are Muslims. However, reasonable number of residents of other religions and faiths also dwell in the area. These include Christians and Sikhs. Compared to other minority communities, Christians are far in number. Punjabi is the native language and is spoken widely in the area. However, Urdu is



		gaining popularity and is becoming the lingua franca, particularly among the educated youth. People generally respect chadar and chardewari, i.e. they do not mingle with women publicly and stay away from other houses and respectfully wait to be called in or the residents to come out from their houses. A reasonable proportion of womenfolk observe the purdah etiquette, i.e. they remain secluded from outsiders. However, womenfolk do participate in almost all sort of social, cultural, economic, educational, and service activities.
6.	Lab Reports of Environmental Analyses	The lab reports of all essential and applicable parameters i.e., Air, Water and Noise have been made a part of the instant EIAR, as Annex-3.

Clause 2.3(E)

Screening of Potential Environmental Impacts and Mitigation Measures should include Environmental Parameters regarding:

1.	Project Location	No adverse impacts relating to location. The site is a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah. Number of industrial concerns are already existing and operational in the vicinity. Therefore, the selected site is best-suited for setting up the instant plant.
2.	Design	No adverse impacts relating to design of the plant. The project simply involves construction of a fat melting & protein recovery unit on a vacant land owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah. As far as layout plan is concerned, it will be prepared in strict accordance with the applicable building bylaws of the concerned regulatory authority. As far as selection of the machinery and equipment is concerned, the proponent is searching for the efficient and the most economical machinery and equipment out of a host of manufacturers both inland and abroad.
3.	During Construction Phase	No impacts are expected during construction of the plant, as this phase will involve construction of the building and installation of the selected machinery, equipment and other support infrastructure. Therefore, no any disturbances to any of the environmental parameters or the bioindicators is expected from any of the construction activities. The small-scale civil works will not cause any disturbance to environment in any way at all.
4.	During Operational Phase	The operation of the plant as a facility for recovery of tallow and animal protein from waste materials will not be associated with environmental impacts except, if (a) appropriate pollution / emission control equipment is not fitted with the machinery and equipment, and (b) the pollution control equipment, somehow, becomes dysfunctional and operationally faulty. The rest of the environmental impacts of the operation phase, from lifting and transportation of the raw materials from their respective sources of origin to the plant will be all negligible and of no significance at all. Additionally, they all will be mitigable and will be attenuated by implementing the recommended mitigation measures as given in the EIAR and the EMP. The environmental impacts of operation of the plant will be all mitigated by fitting appropriate pollution control equipment and practising good housekeeping practices. The air emissions, wastewater and solid waste during operation of the plant will be taken care of through appropriate mitigation measures. Moreover, all operational activities will remain confined within the plant premises and will not be of relevance outside the plant premises.
5.	Potential Environmental Enhancement Measures	In addition to installation of the appropriate pollution / emission control equipment, massive tree plantation, development of greenbelts, grass lawns and floral plantation has been proposed as some other potential environmental enhancement measures. In order to ensure worker safety and personal health, provision of safety equipment, usage of the kind of apparel, appropriate tools for accomplishing a particular task



the workers, and installation of a robust firefighting system have also been proposed as other environmental enhancement measures.

Clause 2.3(F)**Environmental Management and Monitoring Program should include:**

1.	Institutional Capacity	A comprehensive environmental management and monitoring plan (EMP) has been made an integral part of the instant EIA. The EMP enlists the steps and activities regarding upgrading of the institutional capacity.
2.	Training Schedules	-do-
3.	Summary of Impacts and their Mitigation Measures	-do-
4.	Equipment Maintenance Details	-do-
5.	Environmental Budget	-do-

Clause 2.5**Involvement of Stakeholders/Public Consultation:**

1.	Communicate the possible impacts and concerns to assist further analysis and decision making:	In accordance with the laid down practice, preliminary consultation was made with the vicinity residents and the likely stakeholders regarding setting-up of the instant project, the details whereof have been incorporated as a separate chapter in this EIA. Nevertheless, a full length and comprehensive stakeholders' consultation will be arranged to solicit public concerns during open public hearing into the project, being an integral part of the EIA approval process in terms of Regulation 7(1)(a) of the IEE/EIA Regulations 2022.
2.	▪ Proponent	Muhammad Qasim S/o Ghulam Hussain Proponent, R/o Ward No. 4, Mohallah Sadiqabad Chowk Azam, Tehsil & District Layyah
3.	▪ The Responsible Authority	The proponent through the Admin Manager of the plant. The Shift Incharge will act as the designated ESM Manager of the plant.
4.	▪ Other Departments and Agencies	Nil
5.	▪ Environmental Practitioners and Experts	M/s Green Revolution, Environmental Management & Legal Consultants
6.	▪ Affected and Wider Community	Nil

Clause 2.7**Site Selection should include:**

1.	suitability of the site (will not be prohibited, environmentally sensitive, incompatible to surroundings and unsuitable)	The selected site is suitable for setting-up of the instant plant. The site is: ✓ Suitable for setting up the plant ✓ Situated away and at a safe distance from any nearby human population ✓ Not situated in an ecologically sensitive zone ✓ Not situated in an environmentally protected area ✓ Not situated in a protected wildlife sanctuary ✓ Not situated in a negative zone ✓ Situated near a drainage channel ✓ All civic amenities and utilities are available ✓ Accessible easily from the main Multan Road (N5) In view of the foregoing factors, the site is fully suitable and compatible with the intended plant.
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3. Assessing the Impacts (For EIA only)**Clause 3.2****Identification of all Impacts (Tab 2):**

1.	Methodologies for Impact	All relevant methodologies including checklists, integrated matrices and
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	Identification (one/more)	incisive questionnaire methodologies have been employed for assessing and evaluating the likely or foreseeable environmental impact on the instant project
2.	Checklists	-do- (Yes)
3.	Matrices	-do- (Yes)
4.	Networks	-do- (Yes)
5.	Overlays	-do- (Yes)
6.	GIS and computer expert systems	-do- (Yes)

Clause 3.3**Impact Analysis and Prediction (one/more):**

1.	Meetings	Number of meetings were held with the proponent, EPA officials and the relevant stakeholders during the EIA process. The results and outcome of which is recapitulated in the section on stakeholders' consultations
2.	Workshops	-do-
3.	Consultation/Case Study	-do-

Clause 3.5**Impact Analysis and Prediction (one/more):**

1.	Characteristics of Impacts (Nature, Magnitude, Risk Extent, Location, Timing, Duration, Reversibility)	A comprehensive and detailed examination, analysis, valuation assessment and likely impacts, alongwith appropriate mitigation measures is contained in the relevant section(s) of the EIA. It would suffice to state the instant EIAR is comprehensive and all-encompassing in all aspects relating to the subject including mitigation of the likely impacts.
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Clause 3.5

Impact Significance: Acceptable, require Mitigation, or are Unacceptable to the Community:

1.	Ecological Importance	A comprehensive and detailed examination, analysis, valuation assessment and likely impacts, alongwith appropriate mitigation measures is contained in the relevant section(s) of the EIA. It would suffice to state the instant EIAR is comprehensive and all-encompassing in all aspects relating to the subject including mitigation of the likely impacts.
2.	Social Importance	-do-
3.	Environmental Standards	-do-

4. Mitigation and Impact Assessment**Clause 4.1****Purpose of Mitigation Measures should include:**

1.	What is the Problem?	A comprehensive and detailed examination, analysis, valuation assessment and likely impacts, alongwith appropriate mitigation measures is contained in the relevant section(s) of the EIA. It would suffice to state the instant EIAR is comprehensive and all-encompassing in all aspects relating to the subject including mitigation of the likely impacts.
2.	When will the problem occur and when it should be addressed?	-do-
3.	Where problem should be addressed?	-do-
4.	How the problem should be addressed	-do-

Clause 4.2

EIAR: Setting-up of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]", Chak 285/TDA, Distt. Layyah
Green Revolution, 2023

**Ways of achieving Mitigation Measures:**

1.	Changes In Planning and Design	A comprehensive and detailed examination, analysis, valuation, assessment and likely impacts, alongwith appropriate mitigation measures is contained in the relevant section(s) of the EIA. It would suffice to state the instant EIAR is comprehensive and all-encompassing in all aspects relating to the subject including mitigation of the likely impacts.
2.	Improved Monitoring and Management Practices	-do-
3.	Compensation In Money Terms	-do-
4.	Replacement, Relocation and Rehabilitation	-do-

Clause 4.3

1.	Prepare an Environmental Management Plan	A comprehensive environmental management and monitoring plan (EMP) has been made an integral part / separate section of the instant EIAR
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5. Reporting**Clause 5.1**

1.	Clear Reporting Style Supported by Maps or other Descriptive Details	Yes. The EIAR contains complete detail about setting-up of the plant Including the relevant drawings, maps and other relevant info.
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Clause 5.2

1.	Specific Term of References should be Present in Report	The specific terms of reference, as agreed between the proponent and the consultant, have been reproduced as Annex-7 Of the EIAR.
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Clause 5.3

1.	Appendices	Appendices are present at the end of the EIAR
2.	Glossary	Requisite information has been given in the EIAR under the heading "Glossary"
3.	List of Abbreviations	Requisite information has been given in the EIAR under the heading "Abbreviations"
4.	Lists of Individuals and Organizations Consulted alongwith their Written Feedback	Requisite information has been given under the heading "Persons Consulted and Interviewed" as Annex-5 of the IEER
5.	Sources of Data and a Full List of all Reference Material used	Requisite information has been given in the EIAR under the heading "References"
6.	Terms of References of Environmental Reports and those given to Individual Specialists	Requisite information has been given in the EIAR under the heading "Consultant's Team of Professionals"
7.	List of Names, Qualifications and Roles of Team Members carrying out the IEE/EIA	Requisite information has been given in the EIAR under the heading "Consultant's Team of Professionals"



EXECUTIVE SUMMARY



EXECUTIVE SUMMARY

ES.1: Title & Location of the Project

Title:

Construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]".

Location:

Chak 285/TDA Road, Tehsil and Distt. Layyah. The geographical coordinates of the site are 30°59'51.7"N 71°03'54.8"E and an altitude of 143 m above sea.

ES.2 Name of Proponent

Name: Muhammad Qasim, Owner/Proponent

Maryam Fatima Enterprises is a sole proprietorship owned by Muhammad Qasim S/o Ghulam Hussain Proponent, R/o Ward No. 4, Mohallah Sadqabad Chowk Adam, Tehsil & District Layyah. Being a sole proprietorship, it does not require to be registered with the Securities and Exchange Commission of Pakistan. The primary business of the proponent is trade of used, discarded, spent and waste materials including their purchase, sale, storage, treatment, reuse, recycling and disposal. The sources of waste materials traded-in by the proponent include the industrial, commercial, institutional, domestic, municipal and healthcare establishments.

ES.3 Name of the Organization Preparing Report

"Green Revolution", Environmental Management and Legal Consultants, Lahore. Green Revolution are the leading environmental management consultants have performed as the accredited environmental consultants of the project. Green Revolution have their Head Office at Lahore and branch offices in the Federal Capital and all Provincial Capitals of Karachi, Peshawar and Quetta.

ES.4 Brief Outline of the Proposal

The project essentially is construction of a Fat Melting & Protein Recovery Unit under the name and style, "Maryam Fatima Enterprises". As the name indicates, the project primarily is transformation of the unstable animal fat into stable fat [called tallow] by melting it at appropriate temperature, removing the impurities and then letting it cured at ambient temperature. The second component i.e., protein recovery is also an alike thermal process in which the discarded parts of poultry and birds are cooked in a digester at an appropriate temperature for the requisite duration of time and after removal of the excess oil and fat, are crushed into a granular proteinaceous material, which is used in the manufacturing of poultry feed.

The project will be an environmentally controlled unit situated in open countryside on a hitherto vacant plot of land, owned and possessed by the proponent at Chak 285/TDA, Tehsil and District Layyah. It will be spanned over an area of approx. 27225 Sft amidst open lands around. It will be situated at a distance of at least 1.5 km from the village/settlement nearest to the site. The project will be constructed as a semi-automatic plant. However, owing to its smaller size, majority operations will be done manually. Both feeding of the poultry waste and removal of the prepared product from the pressure digesters/cookers will be manual. All equipment and machinery will be installed in the production hall to be constructed anew. A detail description of the processes will follow. Salient features of the plant are given in a table form, as hereunder:

Particulars	Description
Name of the project	Construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]".
Location	The plant will be located at Chak 285/TDA Road, Tehsil and Distt. Layyah
Area	Total area 27225 Sft (5 Kanal) khewat No.6, khatooni 32 to 61. However, additional land will be made available by the proponent if so needed for future expansion.
Make, model and manufacturer	Locally fabricated double body cookers/ digesters fitted with steam jacket and all necessary equipment and gadgets
Specifications	Mild steel cookers/digesters for cooking of poultry waste and MS pans for melting of animal fat, as per manufacturer/fabricator's specifications
Temperature control	Temperature probes with screen display, monitoring and control
Installed capacity	Upto 6,000-8,000 kg (6-8 tonne) each cooker for the poultry waste and 1 tonne each pan for fat melting/tallow making



Operational capacity	The initial operational capacity will be 500 kg (0.5 tonne) per hour, which will gradually increased to 10,000 kg (10 tonne) per hour over lifetime of the project line with business expansion
Road access	The site is accessible from the Layyah Section of Indus Highway (N55) via Ch 285/TDA road. N55 is one of the largest national highways of the country that run parallel along the west bank of river Indus and links all major cities situated along its trajectory including Layyah. It is the principal road route for the transportation of goods and passengers between some major destinations of the country located on it. The siting of the unit at the selected site proximal to the national highway will be highly advantageous for the intended operations of the plant.
Nature of wastes	All types of municipal, commercial, domestic, industrial and other wastes including the hazardous wastes, biomedical and healthcare waste, obnoxious waste except the radiological and explosive waste
Igniting fuel	Ordinary wood will be used as the primary fuel for the steam and will be replaced with natural gas, as and when the latter would become available
Water availability	Water is available at site. Water will be stored first in an underground tank from where it will be pump lifted to an overhead tank/reservoir
Emissions and effluent control	The excess steam coming from the cookers/digesters will be collected and will be cooled down and condensate to reform into water by passing it firstly through a water tank for removing the odorous substances and then through the cooling tower to bring down its temperature to the ambient atmospheric temperature. The stack emissions from the boiler chimney will not require any pretreatment, as on good quality fuel like wood or gas will be used in the boiler. Moreover, the height of the chimney will be of the recommended height [30-35 feet] to let the warm steam pass out easily. In this way, only the PEQS compliant emissions will be released to the exterior. The steam condensate will be reused and recycled in the system and excess water, if any, will be used for watering the greenbelts and tree-plantation around the site/premises. There will not be the generation of any surplus used up water, as might require disposal into any nearby wastewater channel. Release of the wastewater, if there be any, will be only after making it conformant to the applicable PEQS. On account of the very nature of the process operations, there will not be the generation of any solid wastes, as might require disposal. Whatsoever little solid wastes that will be produced at the plant will be disposed through the waste management system of the local municipality.
Power source	The main power source for the project will be the WAPDA mains, which will be supplemented by a standby diesel generator in case of electricity outages.
Start of operation	The operation of the plant will commence only after complete setting-up of the machinery, equipment and the pollution control system and that too upon environmental approval from the EPA-Pb

Process Description

As the name indicates, the project essentially is a combined facility for tallow making and recovery of protein from poultry waste in the same machines under one roof. Hence, description of both processes has been given separately for the facility of easy understanding of the reader.

The fat melting i.e., tallow making is a process of stabilization of the pre-treated fat (i.e., pre-cooked) of animal origin. The stabilized liquid fat is used in the manufacturing of various secondary products. The proponent will collect the pre-treated fat (tallow) from various dealers in the area. In order to make it suitable for secondary manufacturing, the raw animal fat is subjected to a two-step stabilization process. In the first stage, the original raw fat, as obtained from slaughtered livestock, is heated to convert it into the primary treated fat. This is done by heating and cooking the raw fat. This step will not be done at the project. The proponent will buy the already cooked fat from their respective sellers. In the second stage, the primary treated fat will be converted into secondary treated fat once again through the process of heating and cooking.

The instant facility will be a secondary treatment facility where the already treated [primary treated or cooked] fat will be converted into final product for usage as a raw material for the manufacturing of soap and other alike products. It may be mentioned as a passing reference that the raw animal fat, which is the primary source of the primary pre-treated fat, is obtained from the slaughtered animals, livestock and the poultry at the time of slaughtering of these animals/birds. It is first converted into the primary treated fat and then again into the secondary treated fat.



The primary objective of the project is to prepare soap grade fat oil from the precooked animal origin fat obtained from the slaughtered livestock and the poultry. The secondary objective is to provide opportunities of employment and jobs for the needy.

The fat melting [tallow] process at the project facility will consist of the following essential steps:

- ✓ Receipt of pre-cooked hardened animal fat [tallow]
- ✓ Heating and melting of fat in melting pans of appropriate size
- ✓ Removal of impurities from the melting fat
- ✓ Packing of the processed fat [tallow] in suitable contains, usually drums

The re-cooking of the already cooked fat will be carried out in large sized open pans of 1~2 tonne capacity each. Animal fat usually becomes stabilized at a temperature of 180°C. therefore, the primary treated fat will be heated continuously at a temperature of 180°C for around 4~6 hours at normal atmospheric pressure. This will convert the primary cooked fat into a stabilized end-product, the liquified tallow. It need no mention that the impurities and the lightweight foam that scums at the top surface of liquifying fat will be removed, as and when sufficient amount, becomes accumulated atop.

To start with, the proponent intends to install 4-6 cooking pans, 1-2 cleaning and settling tanks and 2-4 finished product storage tanks. However, number of these may be increased or decreased depending on market response and other factors. All the tanks will be made of the ordinary steel sheets of appropriate thickness.

As mentioned above, the project will start initially with 4~6 pans of 1 tonne capacity each. Thus, the production capacity @ 1 tonne of fat oil per pan will be 4-6 tonne per batch of 8 hours. Therefore, the combined daily production capacity of all three batches will be 12~18 tonnes of fat oil. In this manner, the annual production, after deducting the idle time of maintenance, leaves and non-operation days, the annual production capacity will be 3,360 to 5040 tonnes against the industrial year of 280 days. However, this assumed production capacity may increase or decrease depending on the number of the operational fat cooking or melting pans.

In the protein recovery process, protein compounds will be recovered from discarded parts of the slaughtered poultry through the process of pressure digestion. Protein recovery will be through steam cooking/ digestion of the otherwise unusable poultry parts, collected from various retail poultry outlets. Cooking/digestion will be carried out in large size horizontal pressure digesters/cookers of 6~8 tonne capacity each. The process will be a batched production process of around 6 hours each with an interval of two hours, during which the poultry waste will be fed into the digesters. The process of digestion will take place at a temperature of 180°C and at a pressure of 150 lb/psi. Although, digestion will take place inside the pressure digesters, yet excess steam formed during digestion will find its way out through the safety release valve. This exhaust steam may contain some odorous compounds, hence some odour around the cooker/digester. The process will consist generally of the following steps:

- ✓ Receipt of poultry waste from their respective vendors
- ✓ Cooking of the waste in large sized cookers/digesters
- ✓ Removal of excess oil from the cooked fat by centrifuge press
- ✓ Granulation of the dry cooked cake
- ✓ Packing and storing for supplying to market

As per the information provided by the proponent, he will collect the unusable poultry waste of the slaughtered poultry from various poultry meat selling outlets of the area in closed containers. The collection containers will be brought to the project site in appropriate carriage vehicles. The incoming poultry waste will be first unloaded in the receiving hall, from where it will be fed into the cookers/digesters from time to time as per requirement. Initially, feeding of the waste to digesters will be manual, which will be soon changed into conveyor belt feeding system. The recovered protein will be taken out from the cookers/digesters manually with the help of rakes. Since, the material will be still hot, it will be transferred first to the curing room, where it will be allowed to cool down to the room temperature. This process is called curing and the product that results are the fine protein granules. This will be filled into polypropylene bags of the size 50kg and 100kg and will be supplied to the market in these bags. The steam that will be used for cooking/digesting the waste material will be recirculated after cooling it down in the cooling tower. The water loss resulting from natural



evaporation during steam condensation and recirculation will be replenished by adding additional freshwater into the system.

In order to control the odour during cooking/digestion, the steam coming out of the cookers/digesters will be let to pass through water. For this purpose, a water tank will be constructed for letting the steam pass through it. The water will act as the odour absorbent material. Furthermore, the digesters will be installed deep inside the production hall so that any steam coming out from them does not find way to outer environment except to pass through the water seal and then to be discharged to the exterior through the chimney.

The only natural resource to be used during construction and operation of the project will be the freshwater which will be used mainly for absorbing odorous steam as well as for washing the floors. Both fat melting and the protein recovery processes will neither require nor consume any other natural resources. Freshwater will be obtained through a groundwater pump, which will be installed anew before starting the construction work. Apart from some other minor uses, freshwater will be used primarily for four major activities at the facility. These uses will include: (i) as the drinking water for the labour and employees, (ii) as the primary agent for controlling odour by absorbing odorous compounds contained in the steam coming out from the pressure cookers/digesters/cookers, (iii) for making steam for the cookers/digesters, and (iv) for various other miscellaneous activities and human needs at worksite toilets and for irrigating the green areas. In order to ensure conservation in usage of water, the freshwater to be consumed in the cooling system and odour control system, will be re-circulated.

The production hall will be fitted with heavy duty exhaust fans for keeping the inside temperature at a desirable level. The floors, particularly the incoming raw material receiving platform will be washed daily with water and detergent for removing dirt and grease. The washout will be drained to the septic tanks for treatment and on the treated wastewater will be discharged out.

Design and Layout of the Cooker/Digester

The proponent has not yet selected the final source for procurement of the cookers/digesters to be installed at the premises. However, the proponent intends to install the locally fabricated machinery and equipment. Currently, the proponent is searching for the best manufacturer in order to be sure that the cookers/digesters fabricated by him are of standard specs and conform to the applicable PEQS.

Design and Layout of the Plant

The salient features of the design and layout of the plant will be as under:

- Incoming and outgoing gate with a guardroom fitted with an inventory recording system
- Parking area for the incoming carriage and personal vehicles
- Vehicle weighbridge (optional)
- Incoming raw material receiving and storage enclosure
- Cookers/digesters fitted with all essential equipment and control systems
- Cooker temperature monitoring and control system
- Steam circulation, capturing, cooling and recirculation system and equipment
- Cooked material removal and curing system
- Excess oil extraction equipment and system
- Packing, storing and dispatching system
- Onsite laboratory
- Other support equipment and facilities (e.g., generator)
- Fire safety and emergency control systems and facilities
- Admin building / office rooms
- Green areas, grassy lawns and tree plantations

The operation of the plant shall commence only after complete setting-up of the machinery, equipment and the odour control system under environmental approval from the EPA-Pb.

ES.5 Major Impacts

As regards its construction and setup, construction of the plant (i.e., civil work construction of the building and installation of machinery) will not be associated with any likely environmental impacts. The plant building will be constructed on a vacant land owned and possessed by the proponent. The site is situated at Chak 285/1 Road, Tehsil and District Layyah. Both construction and operation of the plant will not be associated with any environmental impacts, if suitable pollution control equipment is installed. The implementation of the E



will further ensure environmental compliance and compatibility of the plant with the PEQS. As regards the balance between the negative and the positive impacts, construction and operation of the plant will ensure environment friendly disposal of the solid and hazardous wastes as well as opportunities of job and employment for a fair number of persons including residents of the surrounding areas. A complete detail of the likely environmental impacts and their mitigation is given in a separate section of this EIAR.

The construction of the building and installation of the prefabricated machinery and equipment will be a simple physical activity that will not generate any environmental pollutants in any manner, whatsoever. Hence, no impacts relating to the initial construction phase. Installation of appropriate pollution control system with the plant machinery will be an inseparable component of the project. In addition to installation of the pollution control equipment, implementation of the EMP will further ensure environmental compliance, conformance and compatibility of the plant.

As regards the positive impacts, construction and operation of the plant will ensure environment friendly disposal and management of the ordinary poultry waste and recovery of protein from the same. Plant's construction will also provide opportunities of job and employment for a fair number of persons including the residents of the surrounding areas. A complete detail of the likely environmental impacts and the measures for their mitigation is given in a separate section of this EIAR.

In order to enhance environmental ambience and aesthetics of the premises, development of greenbelts will be taken up as a separate and independent activity alongside construction of the main plant. The proponent has allocated separately a sum of Rs. 0.85 million as the tentative cost of environmental enrichment, aesthetics enhancement and improving landscape of the site. This cost estimate is based on the prevailing market rates of the various input materials, as are prevailing in the market currently. It has been found that setting-up of the plant will not be associated with any undesirable environmental, social and health impacts, and is devoid of any untoward effects on the ambient environment. Nevertheless, certain routine mitigation measures have been suggested to further enhance environmental acceptability of the plant. Of the remote environmental and social impacts, as can be expected during construction of the plant, a few are enumerated, as hereunder. The likely impacts of operation of the plant have been discussed at appropriate places, separately:

- **Impacts relating to land use change:** No serious or significant impacts relating to land use change, as the proponent will obtain necessary NOC from the concerned authority for the permissible land use of the land, which is currently vacant and not under any productive usage. The proponent will setup the plant on a vacant land, owned and possessed by him at Chak 285/TDA Road, Tehsil and Distt. Layyah. The setting-up of the plant on a land measuring 27225 Sft will not result in negative land use change (*The aspect under consideration has no environmental and social impacts at all*)
- **Loss of livelihood and structural damage:** No impacts relating to loss of livelihood and structural damage, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not cause any loss of livelihood and or structural damage to the nearby properties/civil structures, as none exist there (*The aspect under consideration has no environmental and social impacts at all*)
- **Acquisition of houses and allied structures:** No impacts relating to acquisition of houses and allied structures, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not require acquisition of any houses or any allied structures (*The aspect under consideration has no environmental and social impacts at all*)
- **Cutting and removal of trees and crops:** No impacts relating to cutting and removal of trees or crops, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not involve or require cutting and removal of a tree or crop (*The aspect under consideration has no environmental and social impacts at all*)
- **Impeachment of easement rights of the local community:** No impacts relating to impeachment of any easement rights of the local community, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not cause impeachment of



easement rights of the local community (*The aspect under consideration has no environmental and social impacts at all*)

- **Impacts on groundwater:** No impacts on groundwater, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will require only normal amounts of groundwater for construction. As regards water usage impacts of the operation phase, the same have been discussed under the appropriate section of this EIAR (*The aspect under consideration has no environmental and social impacts at all*)
- **Impacts on surface water:** No impacts on local surface water resources, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not utilize surface water for any activity. There is not any natural or manmade surface water channel/body near or in the zone of influence the site. As regards disposal of the excess or used water, the proponent has already obtained the requisite NOC from the concerned authorities for its discharge into the nearby wastewater drain (*The aspect under consideration has no environmental and social impacts at all*)
- **Impacts of inadequate treatment and disposal of wastewaters:** No impacts of inadequate treatment and disposal of wastewaters, as the used water produced at the plant will be appropriately treated and then discharged into the nearby drain, under permission from the Irrigation Department. The water discharged into the drain will conform to the applicable PEQS of the EPA-Pb (*The aspect under consideration has no environmental and social impacts at all*)
- **Impacts of inadequate disposal of MSW:** No impacts of inadequate disposal of the municipal solid waste (MSW), as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not produce any solid wastes during setting up of the plant. As regards collection, management and disposal of the ordinary municipal solid waste during operation of the plant, the same has been discussed under the relevant section of the EIAR (*The aspect under consideration has no environmental and social impacts at all*)
- **Impacts of generation of ambient or neighbourhood noise:** No impacts relating to generation of ambient or neighbourhood noise, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not produce any ambient or neighbourhood noise during setting up of the plant. As regards the operation phase, the noise associated with operating the machinery will not be detectable outside the premises, as the machinery will be fitted inside an enclosure. As regard the plant workers, they all will be provided PPEs including noise masking devices, as indicated and required (*The aspect under consideration has no environmental and social impacts at all*)
- **Impacts on local air quality:** No impacts on local air quality, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not cause any local air quality impacts from any of the civil work activities during setting up of the plant. As regards impacts on air quality during operation phase of the plant, the same have been discussed separately under the relevant section of the EIAR (*The aspect under consideration has no environmental and social impacts at all*)
- **Blowing-off of the drag dust:** No impacts relating to blowing off the drag dust, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not produce any drag dust during setting up of the plant. There will not be any excessive movement of heavy vehicles to the site (*The aspect under consideration has no environmental and social impacts at all*)
- **Impairment of air quality from exhausts of fossil fuel burning:** No impacts of impairment of air quality from fossil fuel burning, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not require usage of fossil fuels during setting up of the plant. The simple civil work activities relating to construction of building and installation of



machinery will not consume any fossil fuels. Likewise, there will not be the exhausts from burning of fossil fuels that might affect the local air quality. ***(The aspect under consideration has no environmental and social impacts at all)***

- **Impacts on ambient air quality:** No impacts on ambient air quality, as setting up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not affect the ambient air quality during setting up of the plant. ***(The aspect under consideration has no environmental and social impacts at all)***
- **Likelihood of accidents and risks of personal injuries:** The likelihood of accidents and risks of personal injuries, during construction/setting up of the plant building and machinery on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah cannot be ruled out altogether. Non-observance of the standard safety precautions, operating procedures, steps for carrying out a particular activity in a safe manner and non-compliance of the recommended precautionary measures may render the workers prone to higher chances of worksite and industrial accidents. It is imperative that all workers, particularly those working near the operational machinery put on the requisite safety equipment and the right kind of dress while on work. Similarly, smoking at the worksite, wearing loose clothes while operating the machinery and the tendency of avoidance to put on safety equipment and apparel while on work, should be strictly discouraged. ***(The aspect under consideration is without any impacts and if there be any, are all mitigable)***
- **Likelihood of land instability and land sliding:** No impacts of likelihood of land instability and land sliding, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not cause any land instability or land sliding from any of the civil work construction activities. The site is situated in the flat floodplains of the central Punjab and not in a hilly terrain. Hence, no impacts relating to this aspect. ***(The aspect under consideration has no environmental and social impacts at all)***
- **Impacts on local ecology, biodiversity and the habitat:** No impacts on local ecology, biodiversity and the habitat, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not affect the local ecology, biodiversity and habitat. The setting-up of the plant on a vacant land, owned and possessed by the proponent will not involve cutting of any trees or plants. Nevertheless, if any tree is cut, although there are no chances, compensatory tree plantation @ two trees for every tree cut has been recommended as the prime mitigation measure to keep the local ecology intact. ***(The aspect under consideration is without any impacts and if there be any, are all mitigable)***
- **Displacement & resettlement issues:** No impacts relating to displacement and resettlement issue, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not cause displacement and resettlement of any population or the property. There is not any human settlement even within the assumed zone of environmental influence of the site. ***(The aspect under consideration has no environmental and social impacts at all)***
- **Social and cultural issues:** No impacts relating to social or cultural aspects, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah will not interfere with the social, cultural and religious beliefs and practices of the local communities in any manner, whatsoever. ***(The aspect under consideration has no environmental and social impacts at all)***
- **Impacts of likelihood of poor designing:** No impacts of likelihood of poor structural design, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah in perfect conformity with design and architectural features. ***(The aspect under consideration has no environmental and social impacts at all)***
- **Likelihood of risks of personal injury:** No impacts of likelihood of risks of personal injuries, as setting-up of the plant on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and

Distt. Layyah will not pose risks of personal injuries during setting up of the plant. Nevertheless, the likelihood of personal injuries will be there only if the workers expose themselves deliberately to the avoidable risks and site hazards unnecessarily. The most likely causes of which will be non-observance of the standard operating procedures and non-observance of the safety precautions for carrying out a certain activity. Adventurism on the part of the workers can be another cause of personal injuries. Nevertheless, likelihood of the personal injuries from other causes cannot be ruled out altogether. However, efforts should be made to minimize occurrence of the risks of personal injuries by instituting a dependable hazard assessment and risk avoidance strategies (*The aspect under consideration has no environmental and social impacts at all*)

A detailed account of the genesis of the above-referred adverse impacts, their potentiality to affect the ambient environment and the measures for mitigations has been presented in the chapter titled, "Environmental Impacts and Their Mitigations" as contained in this EIA Report. However, it would be sufficed here to state that if construction and operation of the plant is carried out in a sustainable manner and in accordance with the ESRMP and the mitigation measures, as given in this EIAR, then the majority of these adverse impacts would become insignificant and of no relevance at all.

ES.6 Recommendations for Mitigation Measures

Besides presenting an in-depth analysis of the environmental and social impacts of setting-up of the plant on a vacant land, owned and possessed by the proponent, the EIA report details a set of comprehensive mitigation measures and strategies for avoiding and countering any adverse environmental and social impacts, as are likely to be encountered at any stage, even in the future as well. Apart from the measures relating to construction, additional measures relating to operation of the plant have also been incorporated in the EIAR.

The majority of the mitigation measures, as suggested in the instant EIA report, are activity based. For example, the risks of personal injuries to the workers during setting-up of the plant and its other components at site, if any, can be avoided by observing the suggested mitigation measures. The open lands and the bare surfaces at the premises may be water sprinkled regularly and routinely to reduce blowing of fugitive dust therefrom. Similarly, emission of air pollutants to the ambient air can be avoided by planting trees at all possible points at the premises. The risks of personal injuries during the operation phase can be curtailed by promoting usage of the safety equipment and instituting a dependable and effective monitoring mechanism for checking delinquencies in this regard. The workers doing the risky jobs e.g., welding, moulding and steel fixing etc. should take all necessary precautions and use recommended safety equipment and gadgets to avoid any untoward happening.

As regards the operation phase, usage of some reasonable volumes of water is expected, both for human consumption, maintaining cookers/digesters' temperature and cooling down the steam. It is expected that the water usage during operation of the plant will be somewhat around @ 100 litres per hour. The water used for the operational and other needs will, however, be recirculated indefinitely. Therefore, the water present in the system will continue to be recirculated and reused barring the water that will be lost through evaporation, leakages and atmospheric phenomenon. The water loss will be replenished through fresh water injection from the groundwater turbine to be installed at the plant. The water replenishment is expected to be @ 1/10th of the system water i.e., approx. 10 litres per hour. The process and cooling water will not require installation of any treatment system, except the settling pond for removal of the particulates. The system water will hardly be discharged to the exterior. It will remain within the closed conduit system. As regard some other water usages for various miscellaneous needs, the usage of water at the worksite toilets will be just normal for such like plants i.e., @ 50-70 litres per person per day. However, spendthrift usage of freshwater at the washrooms may be minimized by fitting auto-shutoff taps. As regards treatment of the sanitation origin wastewater from the worksite toilets, the proponent will construct septic tanks of appropriate capacities for its treatment prior to disposal. As far as the ambience and outlook of the premises is concerned, it will be enhanced by generous planting of green plants, trees, fresh and seasonal exotic flora. The green areas at the premises will be irrigated regularly to keep them fresh and green.

The most significant positive impact of setting-up of the plant will be the environmentally compatible management of the poultry waste for recovery of protein resources. As stated earlier, recovery of fat and protein from the discarded poultry waste is the preferred choice in the current scenario. Therefore, setting up of the plant is need of the time. The recovery of materials in a scientific way will not only ensure protection and preservation of the environment, but also food security for the health and safety of the populace.



The above-mentioned socioeconomic and environmental benefits of setting-up of the plant will far outweigh its potentially negative or adverse impacts, if any. Fortunately, the likely impacts concerning plant's operation are all mitigable. Given the present state of affairs and the increasing awareness about safe disposal of animal origin wastes in the country, setting-up of the plant will be of great benefit for the people, area, and the environment for all times to come. It will ensure appropriate, effective and efficient disposal of waste through the process of fat melting and protein digestion at the plant, which will be beneficial for the area, region and the country.

The project simply is construction of a fat melting & protein recovery unit. There will not be any undesirable impacts from its construction at the proposed site. As regards the impacts of plant's operation, these will be mitigable provided the requisite mitigation measures are implemented in letter and spirit. Contrarily, there will be healthy impacts on the local environment from improved landscape, aesthetics and abatement of pollution from construction of a modern and well-designed building. In addition to the above-listed benefits, some other significant socioeconomic benefits and positive impacts of setting-up of the plant will be the opportunities for employment, training and skill development, both for the skilled and the semi-skilled/ unskilled persons who would be employed or whose services would be hired in connection with setting-up and subsequent running of the plant. Another social benefit of setting-up of the plant will be the income prospects for large number of persons (traders, suppliers, vendors, shopkeepers, service providers, mechanics, artisans etc.) who would be providing goods and services during both construction and operation of the plant. Similarly, setting-up of the plant will be beneficial also for the wholesalers and retailers of the goods and services to be provided for the plant. In nutshell, setting-up of the plant will be beneficial equally for the industry, economy and the environment.

ES.7 Proposed Monitoring

The environmental, social and risk management plan (ESRMP), as given in this document, is meant to provide a reliable mechanism for addressing the likely adverse environmental and social impacts of construction and operation of the plant, if any. It presents a robust system for mitigation and prevention of the adverse impacts in the form of environmental guidelines, measures for risk/hazard avoidance and an institutional setup for implementing the ESRMP. The hierarchy of choices for implementation of the ESRMP are firstly to avoid, and if it is not possible, to attenuate the adverse impacts to an acceptable level by adopting suitable administrative and or technical options. The key components of the ESRMP include environmental guidelines for the project sponsors, planners, design-engineers, contractors, vendors of the various raw materials and finished products and various others concerned.

Besides offering a framework of mitigations in the form of environmental and social management guidelines the ESRMP offers an institutional setup for implementing the environmental guidelines by identifying and designating the focal persons for various activities and other mitigation measures. These focal persons will ensure upward and downward coordination and linkages, removal of bottlenecks in the way of smooth implementation of the ESRMP, establishing a two-way flow of information between the project authorities and the EPA as well as other regulatory authorities and maintaining all the project related monitoring records for meaningful follow-up.

Apart from the relevant focal persons for the various sub-components, there will be an environmental safety, health and social management unit (ESHU) headed by an environmental manager to cater for environmental and safety issues of the plant right from planning stage to its lifelong operations. The job of the ESHU will be to ensure compliance of the environmental guidelines and implementation of the prescribed mitigation, safety, health and hygiene measures at the site. The Environmental Manager will have an independent office and appropriate number of staff to assist him in smooth accomplishment of his duties.

The ESRMP also delineates mechanisms for internal and external compliance monitoring of the plant's environmental performance to ensure regimental observance of the guidelines and other recommendations and mitigation measures at various tiers of responsibilities. Members of the environmental safety, health and social management unit (ESHU) will institute a regular system of the sites' inspections to take note of the environmental non-conformances by the construction contractors, vendors and others concerned. They will use the checklist proforma that has been especially developed by the environmental consultant for this purpose. They will submit daily as well as periodical monthly environmental compliance status reports to the environmental unit and will seek guidance from the Environmental Manager during construction as well as on a need basis as and when required.



In order to ensure long-term environmental and social sustainability of the plant, the report presents a system of external monitoring in the form of regular annual environmental audits. To ensure objectivity and impartiality, the environmental audit and external monitoring will be outsourced to an environmental consultancy of standing and repute. The consultancy should be given the mandate to review implementation of the ESRMP, identify on-the-ground environmental issues and offer recommendations for making the plant's activities compatible with its actual on-ground requirements.

In order to enhance capacity of the concerned personnel in managing the environmental and social issues, the ESRMP presents a system of environmental trainings and capacity building of the project authorities, particularly of the key stakeholders (officers, staff, community and others). Specialized trainings will be offered to functionaries of the environmental management unit.

The ESRMP suggests to hold a few training workshops of shorter durations (one-day) relating to environmental awareness every year all during operational life of the plant. These workshops will be used to apprise the stakeholders (officers, personnel and community) about importance of the environmental issues and enhancing implementation capacities of the project functionaries and authorities. These training sessions will aim at raising participants' understanding about the environmental and social issues of the plant. They will also emphasize on importance of involvement of the stakeholders towards tackling and addressing various environmental and social concerns of the project.

These workshops will be interactive in essence rather than being one-way flow of information. Some sessions will be reserved solely for the officers and staff of the ESHU and will focus more on policy issues and troubleshooting strategies rather than other routine aspects. Development of the training manuals, selection of the suitable environmental consultancy and selection of the appropriate resource persons will precede actual holding of these workshops.



1

INTRODUCTION



1. INTRODUCTION

1.1 Purpose of Report

The purpose of the instant report is to present a comprehensive assessment of the likely environmental impacts of construction and operation of a fat melting & protein recovery unit. The plant will be setup on a vacant land, owned and possessed by the proponent. The plant will primarily be a facility for efficient and controlled melting of fat and recovery of protein grains from the raw materials comprising animal fat and poultry waste. The objective of the instant EIA is to present a preliminary environmental examination and assessment of construction and operation of the plant at the site.

The report presents a detailed review of the various likely environmental impacts relating to setting up of the plant on a vacant land, owned and possessed by the proponent. In addition thereto, the report presents an incisive and in-depth overview of the foreseeable and the likely impacts of the construction and operation phase. The report presents a review of the nature, magnitude and implications of the environmental and social impacts of construction and operation of the plant against the standard environmental parameters, as prescribed under the Punjab Environmental Quality Standards (PEQS). The environmental and social impacts of the various operational activities, all during operational life of the plant, are the two key focussed-areas of the EIA. Besides evaluating the environmental profile of the site, the plant and the operational processes, the report outlines a comprehensive mechanism for addressing the various likely environmental and social concerns, particularly those relating to receiving, handling, storage, and disposal of leftovers at the premises. The report suggests a long-term framework for monitoring the all and various impacts of the plant's operational activities to ensure early detection, remediation, rectification and mitigation of the environmental issues that may crop-up during operation of the plant. Additionally, the report outlines a robust and dependable mechanism to ensure optimal environmental performance of the plant by ensuring an across-the-board implementation of the environmental enhancement programme, comprising the mitigation measures and management guidelines, as contained in the instant EIA.

1.2 Identification of the Project & Proponent

Project:

Construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]" at a vacant plot, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah.

Proponent:

Mr. Muhammad Qasim S/o Ghulam Hussain Proponent, R/o Ward No. 4, Mohallah Sadiqabad Chowk Azam, Tehsil & District Layyah of the project under the banner of his sole proprietorship, Maryam Fatima Enterprises, Layyah. As the company is a sole proprietorship, there is no legal requirement of registration of the business with the Securities and Exchange Commission of Pakistan. The primary business of the company is trade of used, discarded, spent and waste materials including their purchase, sale, storage, treatment, reuse, recycling and disposal. The sources of waste materials traded-in by the proponent include the industrial, commercial, institutional, domestic, municipal and healthcare establishments. The proponent will look after all the aspects concerning environmental approval from the EPA-Pb and will carry out all necessary steps and measures for setting-up of the plant at the site. He will be responsible for removal of the bottlenecks and troubleshooting of the impediments in the way of construction and operation of the unit.

1.3 Environmental Consultant

M/s Green Revolution are the accredited consultants for conducting a detailed and in-depth EIA of setting-up of the plant in accordance with the rules, regulations, guidelines and provisions of relevant laws in vogue. Green Revolution are the leading environmental management and legal consultants. They have performed as the accredited environmental consultants for number of projects in the public and the private sector. Green Revolution have their Head Office at Lahore and branch offices in the Federal Capital and all Provincial Capitals of Karachi, Peshawar and Quetta. The below named persons will act as the Focal Persons for and on behalf of the Proponent and Consultant.

Table 1.3: Contact Details of the Focal Persons of the Proponent and the Environmental Consultant

Proponent	Environmental Consultant
Muhammad Qasim S/o Ghulam Hussain Proponent, R/o Ward No. 4, Mohallah Sadiqabad Chowk Azam, Tehsil & District Layyah , M/S Maryam Fatima	Mr. Kashif Ikram. Green Revolution Office No. 5, Ground Floor



Enterprises
Chak 285/TDA, Chowk Azam
Tehsil and District Layyah

Al-Majeed Centre, Link Faridkot Road, Lahore
Mobi: 03334222332
email: green_sul@gmail.com

2. Brief Description of Project

1.4 Brief Description of the Project

The project essentially is construction of a Fat Melting & Protein Recovery Unit under the name and style "Maryam Fatima Enterprises". As the name indicates, the project primarily is transformation of the unstable animal fat into stable fat [called tallow] by melting it at appropriate temperature, removing the impurities and then letting it cured at ambient temperature. The second component i.e., protein recovery is also an allied thermal process in which the discarded parts of poultry and birds are cooked in a digester at an appropriate temperature for the requisite duration of time and after removal of the excess oil and fat, are crushed into granular proteinaceous material, which is used in the manufacturing of poultry feed.

The project will be an environmentally controlled unit situated in open countryside on a hitherto vacant plot of land, owned and possessed by the proponent at Chak 285/TDA, Tehsil and District Layyah. It will be spanning over an area of approx. 27225 Sft amidst open lands around. It will be situated at a distance of at least 1.5 km from the village/settlement nearest to the site. The project will be constructed as a semi-automatic plant. However, owing to its smaller size, majority operations will be done manually. Both feeding of the poultry waste and removal of the prepared product from the pressure digesters/cookers will be manual. All equipment and machinery will be installed in the production hall to be constructed anew. A detail description of the processes will follow. Salient features of the plant are given in a table form, as hereunder:

Table 1.4.1: Summary of Essential Info

Particulars	Description										
Name of the project	Construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]".										
Location	The plant will be located at Chak 285/TDA Road, Tehsil and Distt. Layyah bearing khewat No.6, khatooni 32 to 61										
Area of projects.	Total Area 27225 Sft. (5 Kanals) However, additional land will be made available to the proponent if so needed for future expansion. Area Details as under: <table border="1"> <tr> <td>Total Area</td><td>27225 Sft</td></tr> <tr> <td>Net Area Plot</td><td>19443 Sft</td></tr> <tr> <td>Covered Area</td><td>G.F 17787.05 Sft</td></tr> <tr> <td>Open Area</td><td>G.F 1656 Sft</td></tr> <tr> <td>Covered Area</td><td>G.F 17787.05 Sft</td></tr> </table>	Total Area	27225 Sft	Net Area Plot	19443 Sft	Covered Area	G.F 17787.05 Sft	Open Area	G.F 1656 Sft	Covered Area	G.F 17787.05 Sft
Total Area	27225 Sft										
Net Area Plot	19443 Sft										
Covered Area	G.F 17787.05 Sft										
Open Area	G.F 1656 Sft										
Covered Area	G.F 17787.05 Sft										
Make, model and manufacturer	Locally fabricated double body cookers/ digesters fitted with stem jacket and necessary equipment and gadgets										
Specifications	Mild steel cookers/digesters for cooking of poultry waste and MS pans for melting of animal fat, as per manufacturer/fabricator's specifications										
Temperature control	Temperature probes with screen display, monitoring and control										
Installed capacity	Upto 6,000-8,000 kg (6-8 tonne) each cooker for the poultry waste and 1 tonne each pan for fat melting/tallow making										
Operational capacity	The initial operational capacity will be 500 kg (0.5 tonne) per hour, which will be gradually increased to 10,000 kg (10 tonne) per hour over lifetime of the project in line with business expansion										
Road access	The site is accessible from the Layyah Section of Indus Highway [N55] via Chak 285/TDA road. N55 is one of the largest national highways of the country that runs parallel along the west bank of river Indus and links all major cities situated along its trajectory including Layyah. It is the principal road route for the transportation of goods and passengers between some major destinations of the country located on it. The siting of the unit at the selected site proximal to the national highway will be highly advantageous for the intended operations of the plant.										
Nature of wastes	All types of municipal, commercial, domestic, industrial and other wastes including the hazardous wastes, biomedical and healthcare waste, obnoxious waste except the radiological and explosive waste										
Igniting fuel	Ordinary wood will be used as the primary fuel for the steam and will be replaced with natural gas, as and when the latter would become available										
Water availability	Water is available at site. Water will be stored first in an underground tank from where it will be pump lifted to an overhead tank/reservoir										



Emissions and effluent control	The excess steam coming from the cookers/digesters will be collected and will be cooled down and condensate to reform into water by passing it firstly through the water tank for removing the odorous substances and then through the cooling tower to bring down its temperature to the ambient atmospheric temperature. The stack emissions from the boiler chimney will not require any pretreatment, as only good quality fuel like wood or gas will be used in the boiler. Moreover, the height of the chimney will be of the recommended height [30-35 feet] to let the warm air pass out easily. In this way, only the PEQS compliant emissions will be released to the exterior. The steam condensate will be reused and recycled in the system and excess water, if any, will be used for watering the greenbelts and tree-plantation at and around the site/premises. There will not be the generation of any surplus used-up water, as might require disposal into any nearby wastewater channel. Release of the wastewater, if there be any, will be only after making it conformant to the applicable PEQS. On account of the very nature of the process operations, there will not be the generation of any solid wastes, as might require disposal. Whatsoever little solid wastes that will be produced at the plant will be disposed of through the waste management system of the local municipality.
Power source	The main power source for the project will be the WAPDA mains, which will be supplemented by a standby diesel generator in case of electricity outages.
Start of operation	The operation of the plant will commence only after complete setting-up of the machinery, equipment and the pollution control system and that too under environmental approval from the EPA-Pb

1.4.1 Process Description

As the name indicates, the project essentially is a combined facility for tallow making and recovery of protein from poultry waste in the same machines under one roof. Hence, description of both processes has been given separately for the facility of easy understanding of the reader.

The fat melting i.e., tallow making is a process of stabilization of the pre-treated fat (i.e., pre-cooked) of animal origin. The stabilized liquid fat is used in the manufacturing of various secondary products. The proponent will collect the pre-treated fat (tallow) from various dealers in the area. In order to make it suitable for soap manufacturing, the raw animal fat is subjected to a two-step stabilization process. In the first stage, the original raw fat, as obtained from slaughtered livestock, is heated to convert it into the primary treated fat. This is done by heating and cooking the raw fat. This step will not be done at the project. The proponent will buy the already cooked fat from their respective sellers. In the second stage, the primary treated fat is converted into secondary treated fat once again through the process of heating and cooking.

The instant facility will be a secondary treatment facility where the already treated [primary treated or pre-cooked] fat will be converted into final product for usage as a raw material for the manufacturing of soap and other alike products. It may be mentioned as a passing reference that the raw animal fat, which is the principal source of the primary pre-treated fat, is obtained from the slaughtered animals, livestock and the poultry at the time of slaughtering of these animals/birds. It is first converted into the primary treated fat and then again into the secondary treated fat.

The primary objective of the project is to prepare soap grade fat oil from the precooked animal origin fat obtained from the slaughtered livestock and the poultry. The secondary objective is to provide opportunities of employment and jobs for the needy.

The fat melting [tallow] process at the project facility will consist of the following essential steps:

- ✓ Receipt of pre-cooked hardened animal fat [tallow]
- ✓ Heating and melting of fat in melting pans of appropriate size
- ✓ Removal of impurities from the melting fat
- ✓ Packing of the processed fat [tallow] in suitable contains, usually drums

The re-cooking of the already cooked fat will be carried out in large sized open pans of 1~2 tonne capacity each. Animal fat usually becomes stabilized at a temperature of 180°C. therefore, the primary treated fat will be heated continuously at a temperature of 180°C for around 4~6 hours at normal atmospheric pressure. This will convert the primary cooked fat into a stabilized end-product, the liquified tallow. It need no mention that the impurities and the lightweight foam that scums at the top surface of liquifying fat will be removed, as and when sufficient amount, becomes accumulated atop.



To start with, the proponent intends to install 4-6 cooking pans, 1-2 cleaning and settling tanks and 2 finished product storage tanks. However, number of these may be increased or decreased depending on market response and other factors. All the tanks will be made of the ordinary steel sheets of appropriate thickness.

As mentioned above, the project will start initially with 4-6 pans of 1 tonne capacity each. Thus, the production capacity @ 1 tonne of fat oil per pan will be 4-6 tonne per batch of 8 hours. Therefore, the combined daily production capacity of all three batches will be 12-18 tonnes of fat oil. In this manner, the annual production, after deducting the idle time of maintenance, leaves and non-operation days, the annual production capacity will be 3,360 to 5040 tonnes against the industrial year of 280 days. However, the assumed production capacity may increase or decrease depending on the number of the operational cooking or melting pans.

In the protein recovery process, protein compounds will be recovered from discarded parts of the slaughtered poultry through the process of pressure digestion. Protein recovery will be through steam cooking/digestion of the otherwise unusable poultry parts, collected from various retail poultry outlets. Cooking/digestion will be carried out in large size horizontal pressure digesters/cookers of 6-8 tonne capacity each. The process will be batched production process of around 6 hours each with an interval of two hours, during which the poultry waste will be fed into the digesters. The process of digestion will take place at a temperature of 180°C and a pressure of 150 lb/psi. Although, digestion will take place inside the pressure digesters, yet excess steam formed during digestion will find its way out through the safety release valve. This exhaust steam may contain some odorous compounds, hence some odour around the cooker/digester. The process will consist generally of the following steps:

- ✓ Receipt of poultry waste from their respective vendors
- ✓ Cooking of the waste in large sized cookers/digesters
- ✓ Removal of excess oil from the cooked fat by centrifuge press
- ✓ Granulation of the dry cooked cake
- ✓ Packing and storing for supplying to market

As per the information provided by the proponent, he will collect the unusable poultry waste of the slaughtered poultry from various poultry meat selling outlets of the area in closed containers. The collected containers will be brought to the project site in appropriate carriage vehicles. The incoming poultry waste will be first unloaded in the receiving hall, from where it will be fed into the cookers/digesters from time to time as per requirement. Initially, feeding of the waste to digesters will be manual, which will be soon changed to a conveyor belt feeding system. The recovered protein will be taken out from the cookers/digesters manually with the help of rakes. Since, the material will be still hot, it will be transferred first to the curing room, where it will be allowed to cool down to the room temperature. This process is called curing and the product thus obtained is the fine protein granules. This will be filled into polypropylene bags of the size 50kg and 100kg and will be supplied to the market in these bags. The steam that will be used for cooking/digesting the waste material will be recirculated after cooling it down in the cooling tower. The water loss resulting from natural evaporation during steam condensation and recirculation will be replenished by adding additional freshwater into the system.

In order to control the odour during cooking/digestion, the steam coming out of the cookers/digesters will be made to pass through water. For this purpose, a water tank will be constructed for letting the steam pass through it. The water will act as the odour absorbent material. Furthermore, the digesters will be installed deep inside the production hall so that any steam coming out from them does not find way to outer environment except to pass through the water seal and then to be discharged to the exterior through the chimney.

The only natural resource to be used during construction and operation of the project will be the freshwater which will be used mainly for absorbing odorous steam as well as for washing the floors. Both fat melting and the protein recovery processes will neither require nor consume any other natural resources. Freshwater will be obtained through a groundwater pump, which will be installed anew before starting the construction work. Apart from some other minor uses, freshwater will be used primarily for four major activities at the facility. These uses will include: (i) as the drinking water for the labour and employees, (ii) as the primary agent for controlling odour by absorbing odorous compounds contained in the steam coming out from the pressure digesters/cookers, (iii) for making steam for the cookers/digesters, and (iv) for various other miscellaneous activities and human needs at worksite toilets and for irrigating the green areas. In order to ensure



conservation in usage of water, the freshwater to be consumed in the cooling system and odour control system, will be re-circulated.

The production hall be fitted with heavy duty exhaust fans for keeping the inside temperature at a desirable level. The floors, particularly the incoming raw material receiving platform will be washed daily with water and detergent for removing dirt and grease. The washout will be drained to the septic tanks for treatment and only the treated wastewater will be discharged out.

1.4.2 Design and Layout Features

The proponent has not yet selected the final source for procurement of the cookers/digesters to be installed at the premises. However, the proponent intends to instal the locally fabricated machinery and equipment. Currently, the proponent is searching for the best manufacturer in order to be sure that the cookers/digesters fabricated by him are of standard specs and conform to the applicable PEQS.

1.4.3 Plant's Design and Layout Plan

The salient features of the design and layout of the plant will be as under:

- Incoming and outgoing gate with a guardroom fitted with an inventory recording system
- Parking area for the incoming carriage and personal vehicles
- Vehicle weighbridge (optional)
- Incoming raw material receiving and storage enclosure
- Cookers/digesters fitted with all essential equipment and control systems
- Cooker temperature monitoring and control system
- Steam circulation, capturing, cooling and recirculation system and equipment
- Cooked material removal and curing system
- Excess oil extraction equipment and system
- Packing, storing and dispatching system
- Onsite laboratory
- Other support equipment and facilities (e.g., generator)
- Fire safety and emergency control systems and facilities
- Admn building / office rooms
- Green areas, grassy lawns and tree plantations

The operation of the plant shall commence only after complete setting-up of the machinery, equipment and the odour control system under environmental approval from the EPA-Pb.

Nature: A plant for fat melting and protein recovery from pre-cooked animal fat and the discarded poultry waste.

Size: 27225 Sft (5 Kanals)

Location: The plant will be located at Chak 285/TDA Road, Tehsil and Distt. Layyah.

Table 1.4.2: Technical Design Specifications and Features

Sr.	Specs	Description
1.	No. of Cookers/Digesters	6-8 (Batch Feeding)
2.	Capacity of each	6-8 tonnes
3.	No. of Fat Melting Pans	4-6
4.	Capacity of each	1 tonne
5.	Outer Body	Mild Steel (8-10mm Thick)
6.	Heating Source	Hot Steam from Boiler
7.	Inner Lining	High Temperature Refractory Steel Lining
8.	Insulation	Special Insulation Lining
9.	Raw Material Feeding Doors	2 feet wide circular lid covered door atop the cooker/digester for feeding- In the raw material
10.	Cooked Material Removal Gate	4 feet wide circular lid covered door on front side of the cooker/digester for removing out the cooked material
11.	Steam Jacket	An outer steam jacket around each cooker/digester for heating the contents
12.	Door Locking	Double Kame Door Locking System



13.	Steam Feeding	Continuous recirculating steam feeding
14.	Steam Condensation	Piped system of steam recirculation, capture and condensate
15.	Automation & Controls	Standard
16.	Operating Panel	Standard
17.	Error Indications	Standard
18.	Body Finishing	High Temp Enamel Paint Finish
19.	Stack / Chimney	MS Made 30-35 Feet Long Chimney with Sampling Port and attached (Dia = 300 mm)

Table 1.4.3: Summary of Technical Specifications

Sr.	Description/Parameter	Required Value
1.	Operation time	6-8 hours
2.	Capacity	6-8 tonne
3.	Operating method	Batch type loading
4.	Temperature	180°C
5.	Water Consumption [Steam Making]	50 l/hr



2

BRIEF DESCRIPTION OF THE PROJECT



2. BRIEF DESCRIPTION OF THE PROJECT

2.1 Type and Category of Project

Type:

A plant for fat melting and protein recovery from pre-cooked animal fat and the discarded poultry waste. The likely process operations indicate that the project resembles a poultry waste processing unit, as listed in Sr. No.9 of Category-B of Schedule-II of the IEE/EIA Regulations, 2022. The plant will be a non-invasive, intrusive and a benign unit, as it will be meant for safe, secure and efficient recovery of animal fat recovery of poultry protein. The construction of the plant's building and installation of machinery equipment inside the building and operation of the plant will not be associated with any environmental, social and health implications.

Category:

A plant for fat melting and protein recovery from pre-cooked animal fat and the discarded poultry waste. The likely process operations indicate that the project resembles a poultry waste processing unit, as listed in Sr. No.9 of Category-B of Schedule-II of the IEE/EIA Regulations, 2022. The plant will be a non-invasive, intrusive and a benign unit, as it will be meant for safe, secure and efficient recovery of animal fat recovery of poultry protein. The construction of the plant's building and installation of machinery equipment inside the building and operation of the plant will not be associated with any environmental, social and health implications.

2.2 Objectives of the Project

The primary objective of construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit] recovery of useful substances from the unwanted and useless animal and poultry waste, which if not managed will be hazardous for the environment, health and safety of the persons. Owing to the increasing awareness about the environmental concerns, the demand for the safe, secure and efficient disposal of all type wastes, particularly those wastes that are likely to affect health and safety of the public, has escalated and the concerned regulatory authorities are under tremendous pressure to ensure safe, secure, environment friendly disposal and management of the health-impacting wastes. Although, reliable statistics are not available in this regard, yet it can be safely inferred that generation of various types of animal and poultry wastes is on the increase and currently runs into thousands of tonnes per day. Whereas, only a fraction of it is being disposed of or treated scientifically, due to shortage or non-availability of the appropriate facility for the purpose.

It is, therefore, need of the time that construction, installation and setting up of the efficient waste recovery plants is ensured by the concerned authorities by encouraging the private sector and the entrepreneurs in this regard. Thus, looking from this perspective, the setting-up of the instant plant can be regarded as a positive step in this direction, as its construction will offer a commercially viable and environmentally compatible solution for the management and disposal of the ever-growing volume of the animal and the poultry waste.

Another linked objective of setting-up of the plant at this site is to help in uplifting of the socioeconomic conditions of the area. The benefits that will come in the wake of setting-up of the plant will help in improving socioeconomic conditions and lifestyle of the local populace. This can be counted as another direct benefit of setting-up of the plant here at the selected site. Similarly, Impetus to commercial activities from trading in commodities concerned with the project and creation of new opportunities of job and employment for locals, which will come in the wake of setting-up of the plant, will be another inseparable benefit of setting-up and operation of the project. The setting-up of the plant will ensure timely and round the year availability of an efficient facility for the safe and secure disposal and recovery of the useful materials from the animal and poultry waste.

The setting-up of the plant is in line with the "Environmental and Health Policy" of Government of the Punjab (GoPb), which emphasizes safe and secure disposal of wastes, particularly the health risk wastes. Viewing this perspective, the primary objective of setting-up of the plant for the recovery of useful materials from discarded and useless animal and poultry wastes, apart from providing the opportunities of new jobs and employment is to combat the environmental pollution through efficient management of these wastes.



2.3 Alternatives of the Project

The possible alternatives to the instant project can be divided broadly into two categories, namely:

- a). Technological alternatives
- b). Site/location alternatives

As far as technological alternatives are concerned, number of options are available. Since, the instant plant is intended for the safe disposal and recovery of useful materials from the discarded animal and poultry waste. Therefore, other alternative options no more remain relevant. Hence, consideration of other technological alternatives is neither valid nor relevant.

As regards the site or location alternatives, only relevant factors need to be taken into consideration while selecting a site for the installation of such a plant. These, inter alia, include availability of suitable land piece of requisite size, safe distance from the nearby population, availability of a drainage channel for disposal of wastewater (if any), and availability of utilities and amenities (like electricity, gas, water, road etc.). Looking from these aspects, the present site, owing to its location in a predominantly open countryside and away from any nearby population, is best-suited for construction of the plant. In view of this position of the matter, consideration of the site selection alternative also becomes invalid and irrelevant.

It will be worthwhile to mention that the project simply is construction of a fat melting & protein recovery unit, which will be setup on a vacant land owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah. The alternatives of relocating the plant to some other site, or not to setup the plant at all at this site and or reducing / enhancing the size and magnitude of plant's operations are of no better advantage than the instant proposal. Hence, consideration of all other alternatives becomes irrelevant and of no benefit at all.

Nevertheless, the following alternatives were considered concerning setting-up of the plant.

- Abandonment of construction / setting-up of the plant (No Project Alternative)
- Changing the magnitude and scope (Downsizing or Upsizing)
- Relocating the plant to some other site (Shifting to other Site)
- Process Modification Alternative (Technological Alternatives)

All the alternatives, as listed above, even after careful consideration, review and evaluation were found not a better choice than construction the plant at the instant site on a vacant land, owned and possessed by the proponent. All the alternatives, other than setting-up of the plant at the present site, were found either costly, time-consuming, non-beneficial for the environment and or of no better advantage on any account compared to the present proposal. Hence, consideration of all the alternatives was dropped as being not warranted and not beneficial.

2.4 Location and Layout of the Project

Location:

The site is situated at Chak 285/TDA Road, Tehsil and Distt. Layyah. The site is a vacant land, owned and possessed by the proponent. The geographical coordinates of the site are $30^{\circ}59'51.7''N$ $71^{\circ}09'54.8''E$ and an altitude of 143M above sea. Fig 2.4a to 2.4i are a few Google Earth images of the site. Pic 2.4a to 2.4b are a few real time photographs of the site, as it exists presently and prior to project's implementation.

Layout: Appended as Annex-1 with the instant EIAR

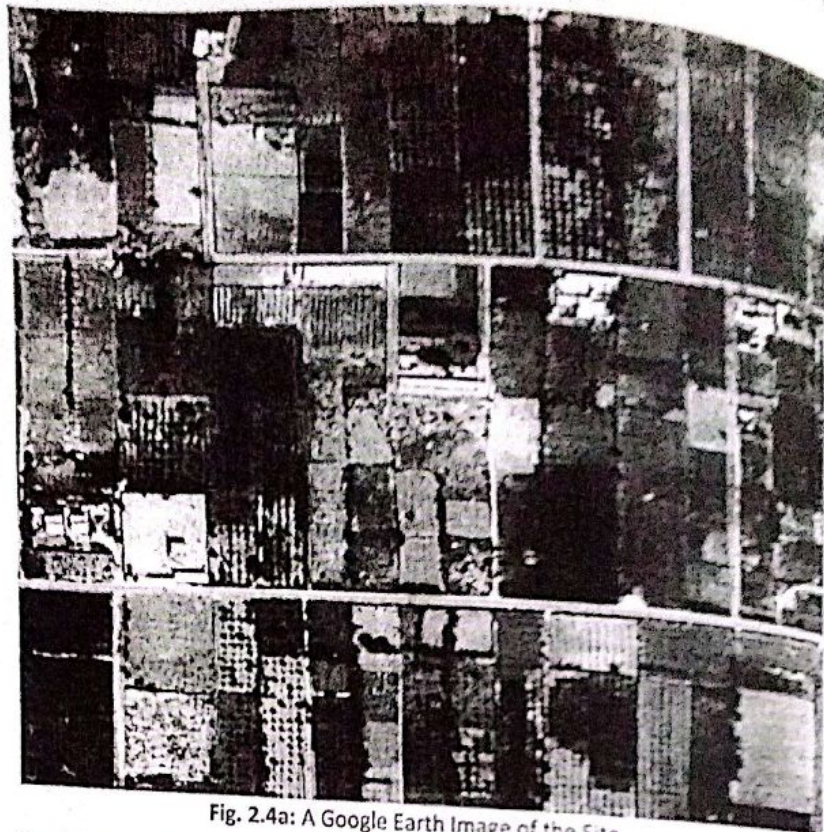


Fig. 2.4a: A Google Earth Image of the Site

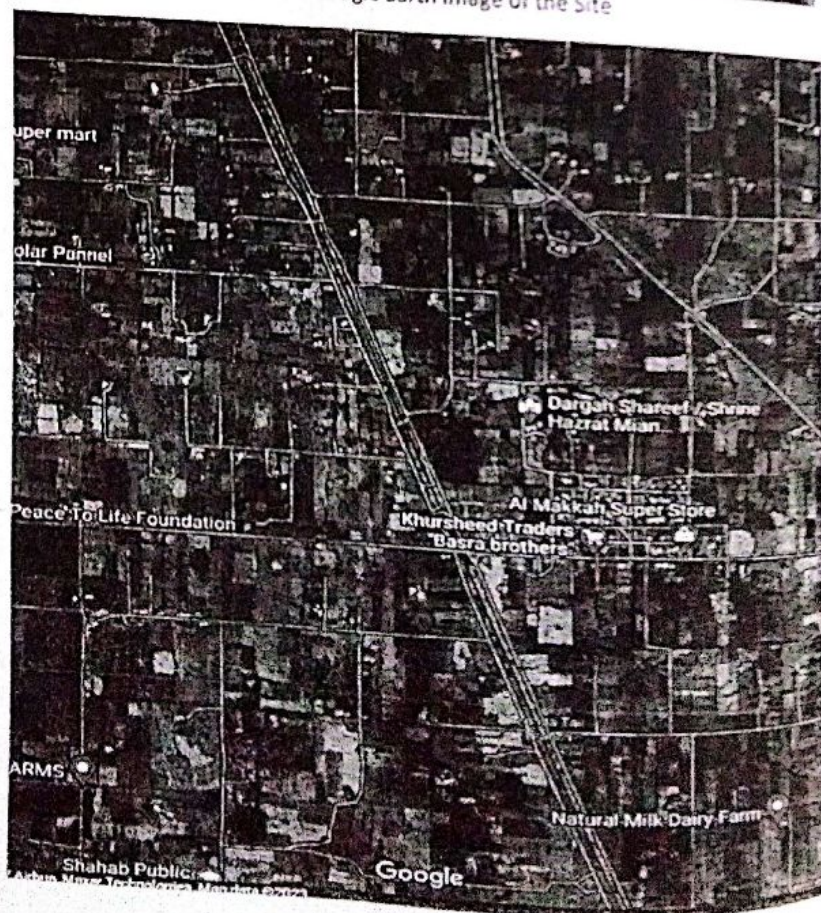


Fig. 2.4b: A Google Earth Image of the Site

EIAR: Setting-up of "Maryam Fatima Enterprises (Fat Melting & Protein Recovery Unit", Chak 285/TDA, Distt. Laryah
Green Revolution, 2023

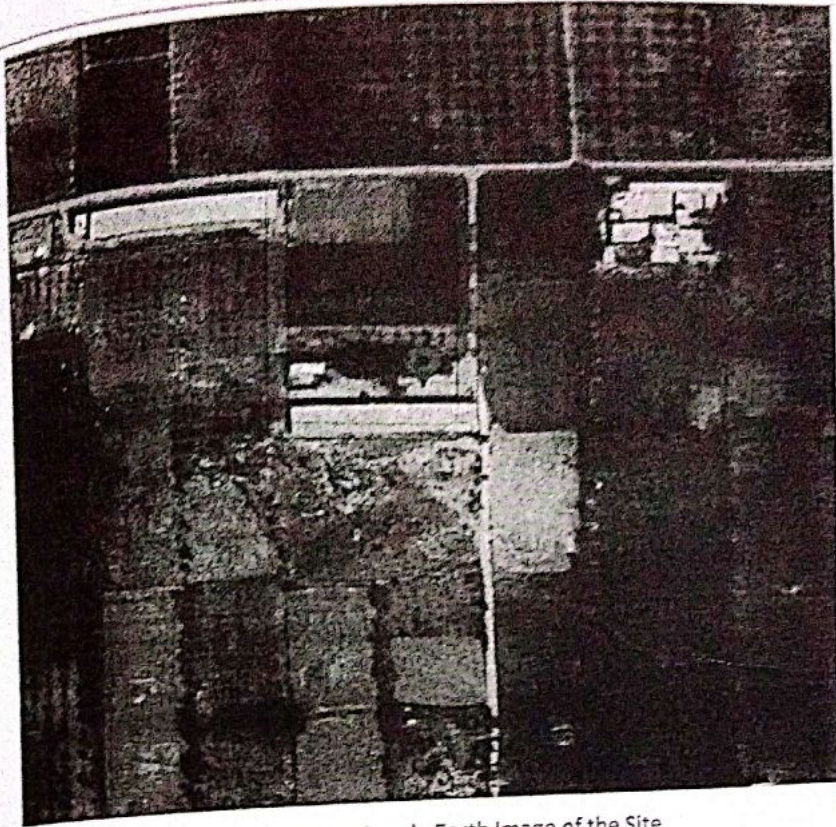


Fig. 2.4c: A Google Earth Image of the Site

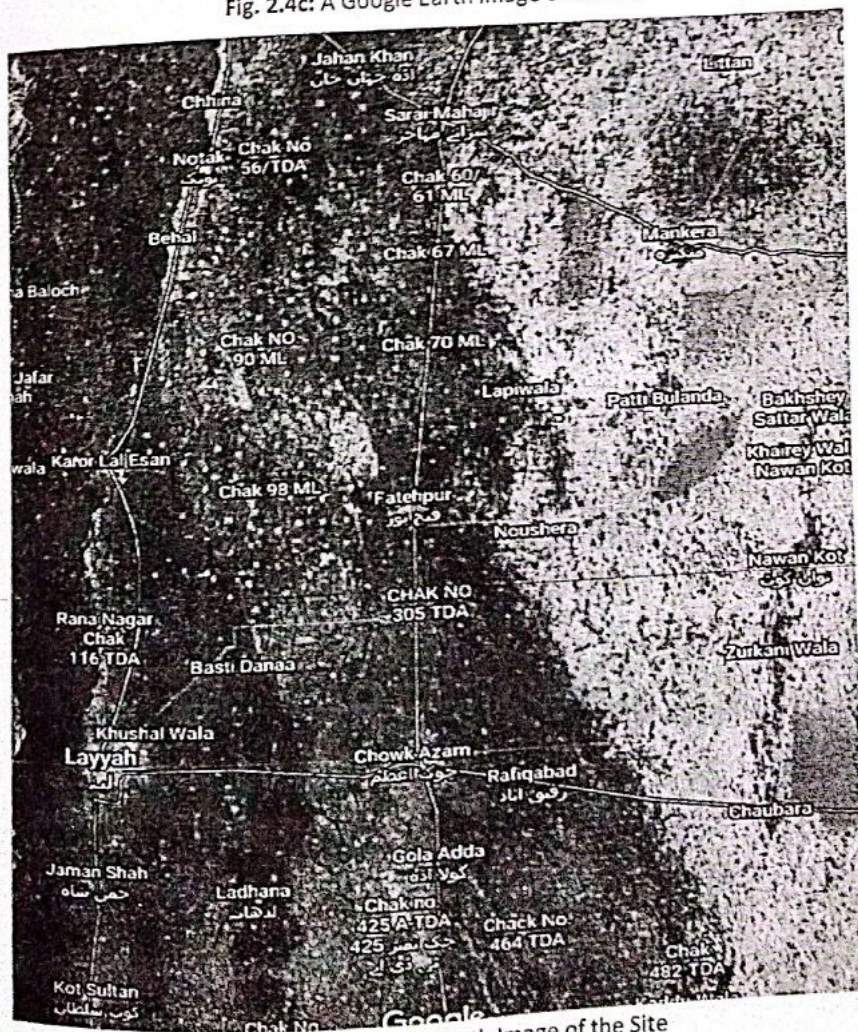


Fig. 2.4d: A Google Earth Image of the Site

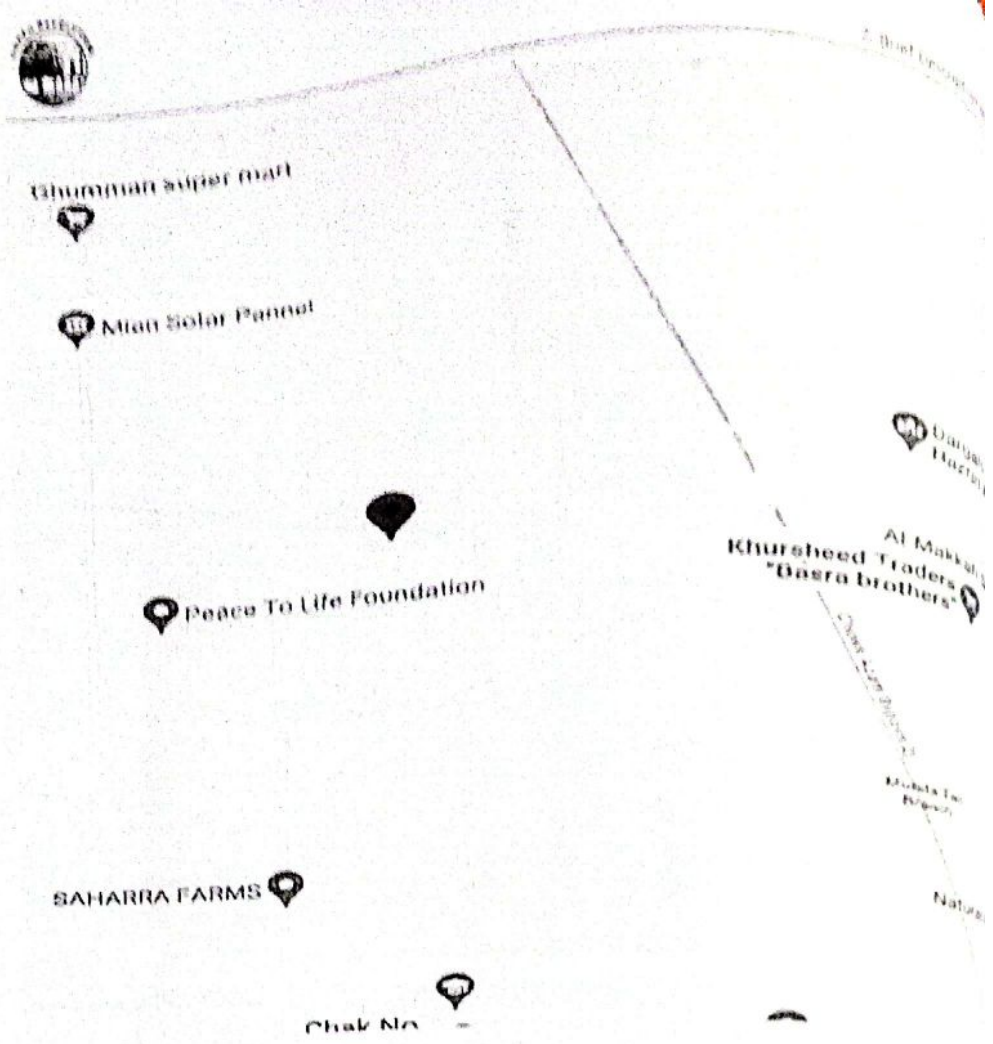


Fig. 2.4e: A Google Earth Image of the Site

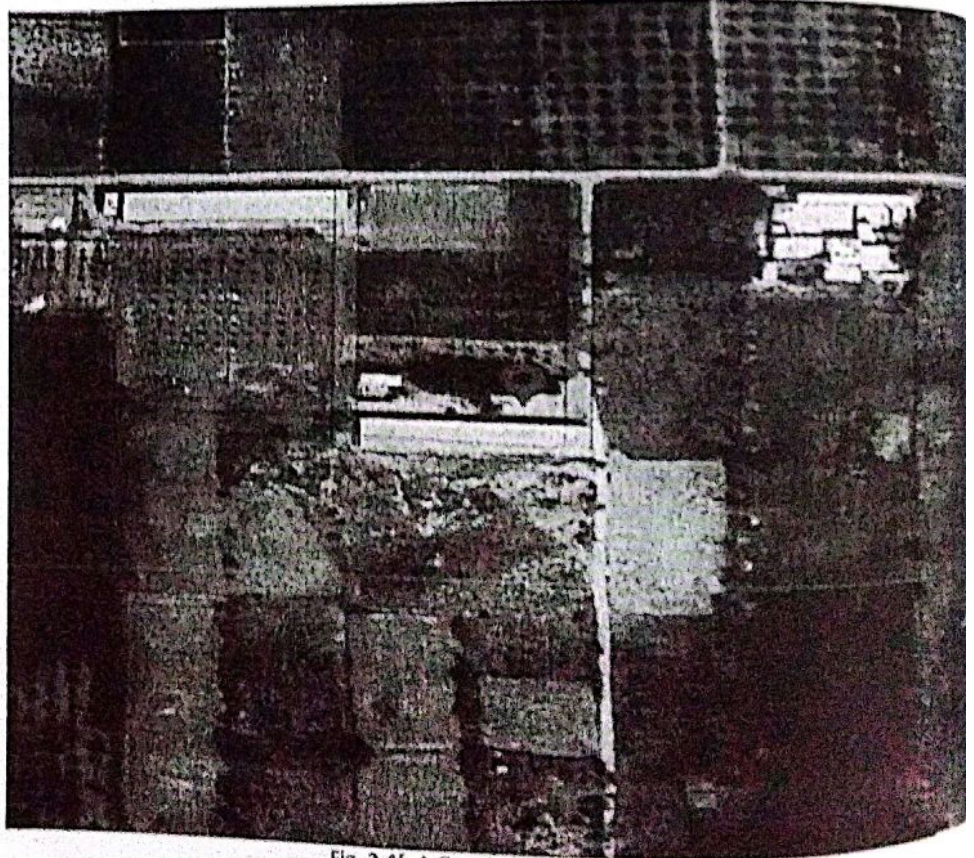
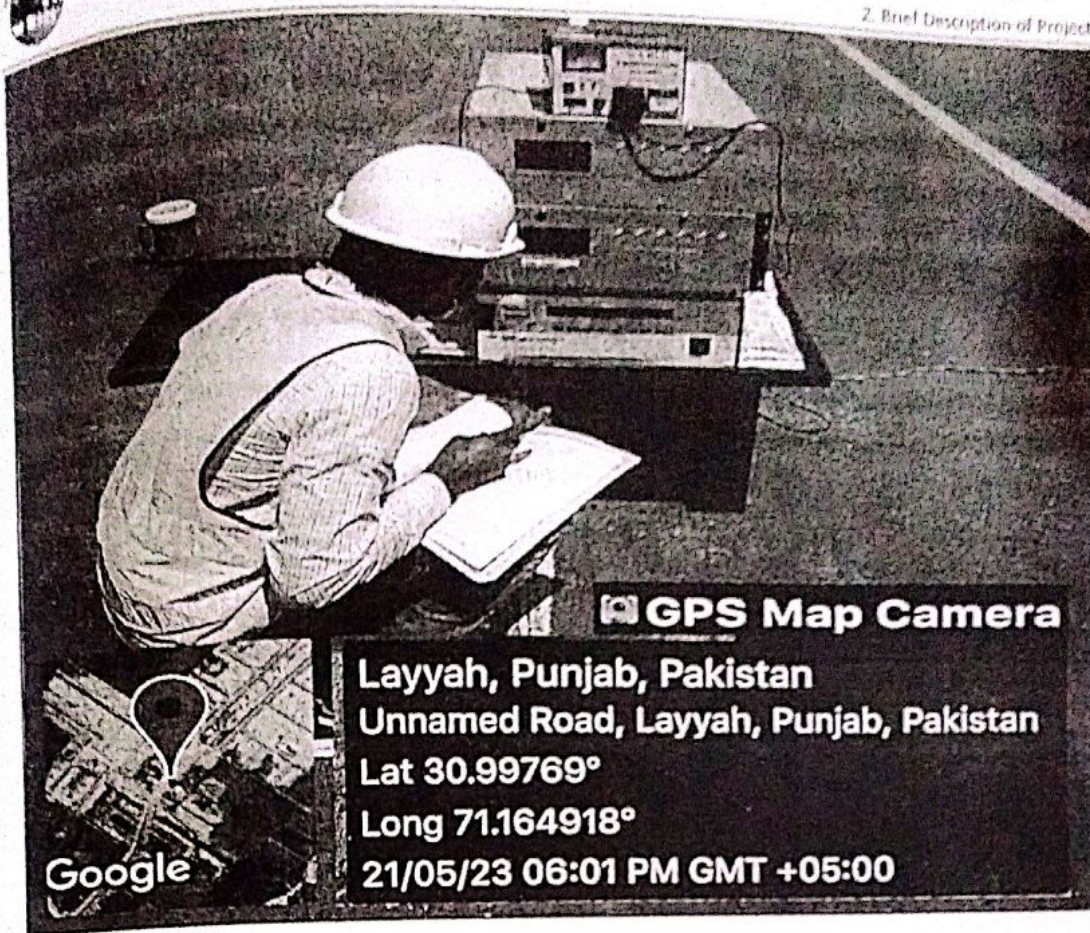
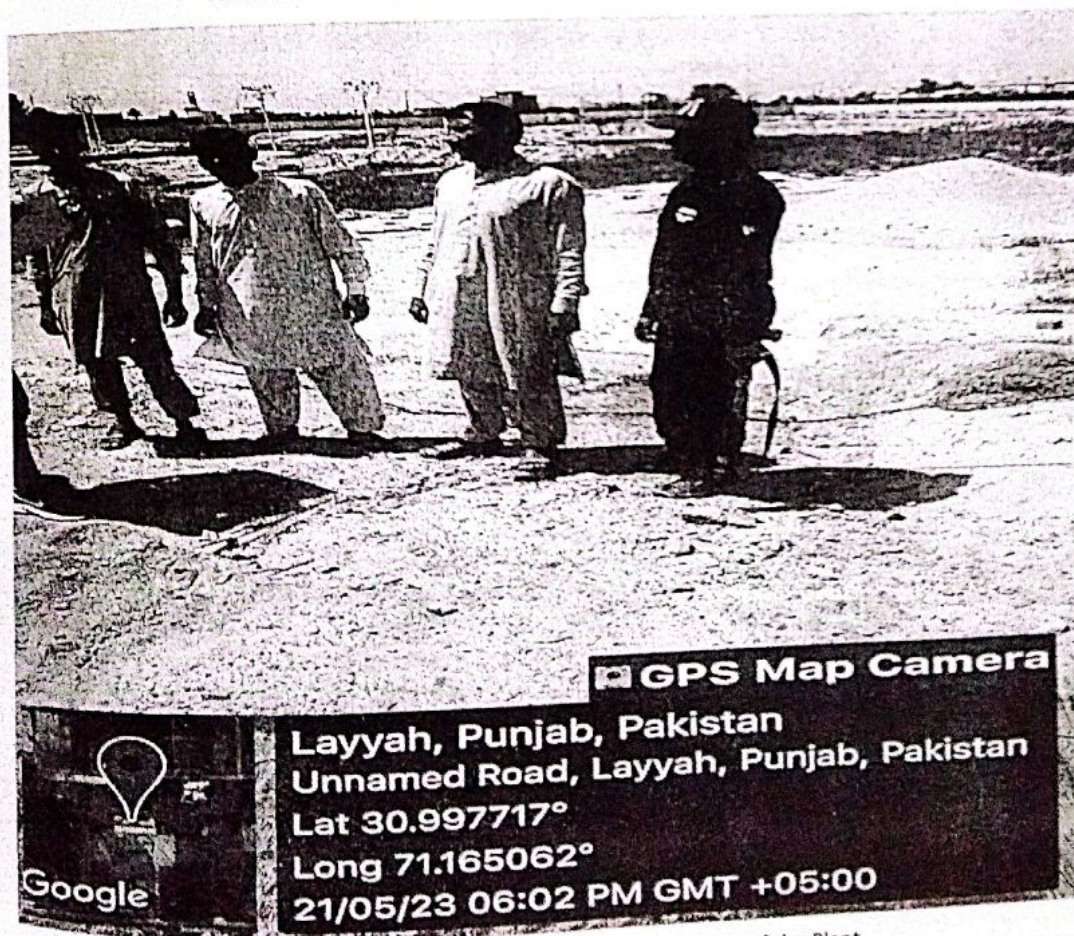


Fig. 2.4f: A Google Earth Image of the Site

EIAR: Setting-up of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]", Chak 285/TDA, Distt. Lavyah
Green Revolution, 2023



Pic. 2.4a: A Real Time Pic of the Site prior Setting-up of the Plant



Pic. 2.4b: A Real Time Pic of the Site prior Setting-up of the Plant

2.5 Land Use of the Site

Currently, the site is a vacant land not under any useful purpose. However, if required, the proponent will ensure its land use change from the concerned regulatory authority prior to taking up construction of the plant. The proponent has marked the site for setting-up the plant here and has already informed the concerned revenue and other authorities of his intention to do so.

2.6 Road Access

The site is accessible from the Layyah Section of Indus Highway [N55] via Chak 285/TDA road. N55 is one of the largest national highways of the country that runs parallel along the west bank of river Indus and links all major cities situated along its trajectory including Layyah. It is the principal road route for the transportation of goods and passengers between some major destinations of the country located on it. The siting of the unit at the selected site proximal to the national highway will be highly advantageous for the intended operations of the plant.

2.7 Vegetation Features of the Site

The site is a vacant land, owned and possessed by the proponent situated on Chak 285/TDA Road, Distt. Layyah. As such, the site is devoid of any unique vegetation features. However, the proponent would plant trees and exotic floral plants at and around the site as well as development of grassy lawns as the prime aesthetic and environment enhancement measure. The vegetation features of the site are insignificant. Being an ordinary vacant land, the site is devoid of any special or significant vegetative features. It is just an ordinary chunk of the floodplains of the Indus basin. Tree plantation will add to the scenic beauty of the site/premises.

2.8 Cost and Magnitude of Operation

Cost:

The tentative cost of setting-up of the plant, including the cost of land, plant, machinery, equipment and others will be less than Rs. 25.50 million. The annual operational cost is expected to be around Rs. 1.85 million. As regards the magnitude of operation, the installed capacity of the plant will be from 24 to 30 metric tonnes per day, which can be increased further by installing additional cookers/digesters, if need. However, actual daily operational capacity will depend on the aggregate amount of waste received from various sources. If the total amount of the waste received daily will be less than the installed operational capacity, all the waste will be processed. On the other hand, if the amount of the received waste will be more than the installed operational capacity, the surplus waste will be kept in waiting and will be processed on the first opportunity.

Magnitude of Operation:

As regards the magnitude of operation, the installed capacity of the plant will be from 24 to 30 metric tonnes per day, which can be increased further by adding additional equipment and machinery, if needed. However, the actual magnitude of operation will depend on the amount of the wastes received from various sources. If the daily amount of wastes received will be less than the installed operational capacity, all the waste will be disposed of and managed accordingly. On the other hand, if the amount of the received waste will be more than the installed operational capacity, the surplus waste will be kept in waiting and will be managed on the first opportunity.

2.9 Schedule of Implementation

The machinery, equipment and the allied components of the plant will be installed and commissioned alongwith construction of civil structures and the building as a one-go activity on fast-track basis and within the shortest possible time. After procurement from their manufacturers, fabricators, traders, sellers and importers, all the machinery and equipment will be transported to the site on suitable carriage vehicles. After unloading, the plant machinery will be setup under supervision of expert engineers and professionals. The setting-up of the machinery, equipment and other allied components will comprise the following steps:

Pre-Construction Stage

- Making preliminary arrangements and spadework of setting-up of the plant at the site
- Receiving and unloading the various parts and components of the machinery and equipment
- Opening outer packaging boxes and cartons of various components of the machinery and equipment by the trained personnel and checking their contents
- Laying of electricity wiring for electric power supply to various machine and equipment from the mains in a safe and secure manner



- Intimation of initiation of construction to the local office of the EPA-Pb and requesting for Env Approval

Construction Stage

- Unpacking of the boxes and cartons and taking out the components out of boxes and containers
- Inspection of the machinery to check for any damage during carriage and transportation
- Clearing the individual site for installation of the individual components of machinery and equipment
- Installation of the machinery and equipment at their respective places safely and securely
- Connecting the machinery and equipment to the electric power supply by expert electrician
- Test run of the machinery and equipment to check for its correct installation
- Removal of the packing material, wraps, boxes and cartons
- Intimation of construction to the local office of the EPA-Pb
- Continuous liaisons with the stakeholders and the EPA-Pb

Post-Construction Stage

- Regular cleaning, greasing, oiling and upkeep of the machinery, equipment and other components
- Routine and emergency repair and maintenance works of the machinery, equipment and building
- Maintenance of water supply and sewerage system for the worksite toilets
- Upkeep of the premises and implementation of other environmental enhancement measures, janitorial services, horticulture and beautification (plantation of trees, exotic shrubs and ornamental flowers) etc.
- Maintenance, inspection and regular upkeep of the firefighting system (risk/hazard management)
- Ensuring round the clock security of the premises by deploying security guards
- Provision of first aid cover for the workers

2.10 Description of the Project

The project essentially is construction of a Fat Melting & Protein Recovery Unit under the name and style, 'Maryam Fatima Enterprises'. As the name indicates, the project primarily is transformation of the unstable animal fat into stable fat [called tallow] by melting it at appropriate temperature, removing the impurities and then letting it solidify at ambient temperature. The second component i.e., protein recovery is also an alike thermal process in which the discarded parts of poultry and birds are cooked in a digester at an appropriate temperature for the requisite duration of time and after removal of the excess oil and fat, are crushed into a granular proteinaceous material, which is used in the manufacturing of poultry feed.

The project will be an environmentally controlled unit situated in open countryside on a hitherto vacant plot of land, owned and possessed by the proponent at Chak 285/TDA, Tehsil and District Layyah. It will be spanned over an area of approx. 27225 Sft amidst open lands around. It will be situated at a distance of at least 1.5 km from the village/settlement nearest to the site. The project will be constructed as a semi-automatic plant. However, owing to its smaller size, majority operations will be done manually. Both feeding of the poultry waste and removal of the prepared product from the pressure digesters/cookers will be manual. All equipment and machinery will be installed in the production hall to be constructed anew. A detail description of the processes will follow. Salient features of the plant are given in a table form, as hereunder:

Table 2.10: Summary of Essential Info

Particulars	Description															
Name of the project	Construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]".															
Location	The plant will be located at Chak 285/TDA Road, Tehsil and Distt. Layyah bearing khewat No.6, khatooni 32 to 61															
Area of Project	Total Area 27225 Sft (5 Kanals) However, additional land will be made available by the proponent if so needed for future expansion. Area Details as under:<table><tr><td>Total Area</td><td colspan="2">27225 Sft</td></tr><tr><td>Net Area Plot</td><td colspan="2">19443 Sft</td></tr><tr><td>Covered Arae</td><td>G.F</td><td>17787.05 Sft</td></tr><tr><td>Open Area</td><td>G.F</td><td>1656 Sft</td></tr><tr><td>Covered Area</td><td>G.F</td><td>17787.05 Sft</td></tr></table>	Total Area	27225 Sft		Net Area Plot	19443 Sft		Covered Arae	G.F	17787.05 Sft	Open Area	G.F	1656 Sft	Covered Area	G.F	17787.05 Sft
Total Area	27225 Sft															
Net Area Plot	19443 Sft															
Covered Arae	G.F	17787.05 Sft														
Open Area	G.F	1656 Sft														
Covered Area	G.F	17787.05 Sft														
Make, model and manufacturer	Locally fabricated double body cookers/ digesters fitted with stem jacket and all necessary equipment and gadgets															
Specifications	Mild steel cookers/digesters for cooking of poultry waste and MS pans for melting of animal fat, as per manufacturer/fabricator's specifications															



Temperature control	Temperature probes with screen display, monitoring and control
Installed capacity	Upto 6,000-8,000 kg (6-8 tonne) each cooker for the poultry waste and 1 tonne each pan for fat melting/tallow making
Operational capacity	The initial operational capacity will be 500 kg (0.5 tonne) per hour, which will be gradually increased to 10,000 kg (10 tonne) per hour over lifetime of the project in line with business expansion
Road access	The site is accessible from the Layyah Section of Indus Highway (NS5) via Chak 285/1 Un road. NS5 is one of the largest national highways of the country that runs parallel along the west bank of river Indus and links all major cities situated along its trajectory including Layyah. It is the principal road route for the transportation of goods and passengers between some major destinations of the country located on it. The siting of the unit at the selected site proximal to the national highway will be highly advantageous for the intended operations of the plant.
Nature of wastes	All types of municipal, commercial, domestic, industrial and other wastes including the hazardous wastes, biomedical and healthcare waste, obnoxious waste except the radiological and explosive waste
Igniting fuel	Ordinary wood will be used as the primary fuel for the steam and will be replaced with natural gas, as and when the latter would become available
Water availability	Water is available at site. Water will be stored first in an underground tank from where it will be pump lifted to an overhead tank/reservoir
Emissions and effluent control	The excess steam coming from the cookers/digesters will be collected and will be cooled down and condensate to reform into water by passing it firstly through the water tank for removing the odorous substances and then through the cooling tower to bring down its temperature to the ambient atmospheric temperature. The stack emissions from the boiler chimney will not require any pretreatment, as only good quality fuel like wood or gas will be used in the boiler. Moreover, the height of the chimney will be of the recommended height (30-35 feet) to let the warm air pass out easily. In this way, only the PEQS compliant emissions will be released to the exterior. The steam condensate will be reused and recycled in the system and excess water, if any, will be used for watering the greenbelts and tree-plantation at and around the site/premises. There will not be the generation of any surplus used-up water, as might require disposal into any nearby wastewater channel. Release of the wastewater, if there be any, will be only after making it conformant to the applicable PEQS. On account of the very nature of the process operations, there will not be the generation of any solid wastes, as might require disposal. Whatsoever little solid wastes that will be produced at the plant will be disposed of through the waste management system of the local municipality.
Power source	The main power source for the project will be the WAPDA mains, which will be supplemented by a standby diesel generator in case of electricity outages.
Start of operation	The operation of the plant will commence only after complete setting-up of the machinery, equipment and the pollution control system and that too under environmental approval from the EPA-Pb

2.10.1 Process Description

As the name indicates, the project essentially is a combined facility for tallow making and recovery of protein from poultry waste in the same machines under one roof. Hence, description of both processes has been given separately for the facility of easy understanding of the reader.

The fat melting i.e., tallow making is a process of stabilization of the pre-treated fat (i.e., pre-cooked) of animal origin. The stabilized liquid fat is used in the manufacturing of various secondary products. The proponent will collect the pre-treated fat (tallow) from various dealers in the area. In order to make it suitable for soap manufacturing, the raw animal fat is subjected to a two-step stabilization process. In the first stage, the original raw fat, as obtained from slaughtered livestock, is heated to convert it into the primary treated fat. This is done by heating and cooking the raw fat. This step will not be done at the project. The proponent will buy the already cooked fat from their respective sellers. In the second stage, the primary treated fat is converted into secondary treated fat once again through the process of heating and cooking.

The instant facility will be a secondary treatment facility where the already treated [primary treated or pre-cooked] fat will be converted into final product for usage as a raw material for the manufacturing of soap and other alike products. It may be mentioned as a passing reference that the raw animal fat, which is the principal



source of the primary pre-treated fat, is obtained from the slaughtered animals, livestock and the poultry at the time of slaughtering of these animals/birds. It is first converted into the primary treated fat and then again into the secondary treated fat.

The primary objective of the project is to prepare soap grade fat oil from the precooked animal origin fat obtained from the slaughtered livestock and the poultry. The secondary objective is to provide opportunities of employment and jobs for the needy.

The fat melting [tallow] process at the project facility will consist of the following essential steps:

- ✓ Receipt of pre-cooked hardened animal fat [tallow]
- ✓ Heating and melting of fat in melting pans of appropriate size
- ✓ Removal of impurities from the melting fat
- ✓ Packing of the processed fat [tallow] in suitable containers, usually drums

The re-cooking of the already cooked fat will be carried out in large sized open pans of 1~2 tonne capacity each. Animal fat usually becomes stabilized at a temperature of 180°C. therefore, the primary treated fat will be heated continuously at a temperature of 180°C for around 4~6 hours at normal atmospheric pressure. This will convert the primary cooked fat into a stabilized end-product, the liquified tallow. It need no mention that the impurities and the lightweight foam that scums at the top surface of liquifying fat will be removed, as and when sufficient amount, becomes accumulated atop.

To start with, the proponent intends to install 4-6 cooking pans, 1-2 cleaning and settling tanks and 2-4 finished product storage tanks. However, number of these may be increased or decreased depending on market response and other factors. All the tanks will be made of the ordinary steel sheets of appropriate thickness.

As mentioned above, the project will start initially with 4~6 pans of 1 tonne capacity each. Thus, the production capacity @ 1 tonne of fat oil per pan will be 4-6 tonne per batch of 8 hours. Therefore, the combined daily production capacity of all three batches will be 12~18 tonnes of fat oil. In this manner, the annual production, after deducting the idle time of maintenance, leaves and non-operation days, the annual production capacity will be 3,360 to 5040 tonnes against the industrial year of 280 days. However, this assumed production capacity may increase or decrease depending on the number of the operational fat cooking or melting pans.

In the protein recovery process, protein compounds will be recovered from discarded parts of the slaughtered poultry through the process of pressure digestion. Protein recovery will be through steam cooking/ digestion of the otherwise unusable poultry parts, collected from various retail poultry outlets. Cooking/digestion will be carried out in large size horizontal pressure digesters/cookers of 6~8 tonne capacity each. The process will be a batched production process of around 6 hours each with an interval of two hours, during which the poultry waste will be fed into the digesters. The process of digestion will take place at a temperature of 180°C and at a pressure of 150 lb/psi. Although, digestion will take place inside the pressure digesters, yet excess steam formed during digestion will find its way out through the safety release valve. This exhaust steam may contain some odorous compounds, hence some odour around the cooker/digester. The process will consist generally of the following steps:

- ✓ Receipt of poultry waste from their respective vendors
- ✓ Cooking of the waste in large sized cookers/digesters
- ✓ Removal of excess oil from the cooked fat by centrifuge press
- ✓ Granulation of the dry cooked cake
- ✓ Packing and storing for supplying to market

As per the information provided by the proponent, he will collect the unusable poultry waste of the slaughtered poultry from various poultry meat selling outlets of the area in closed containers. The collection containers will be brought to the project site in appropriate carriage vehicles. The incoming poultry waste will be first unloaded in the receiving hall, from where it will be fed into the cookers/digesters from time to time as per requirement. Initially, feeding of the waste to digesters will be manual, which will be soon changed into conveyor belt feeding system. The recovered protein will be taken out from the cookers/digesters manually with the help of rakes. Since, the material will be still hot, it will be transferred first to the curing room, where it will be allowed to cool down to the room temperature. This process is called curing and the product that results are the fine protein granules. This will be filled into polypropylene bags of the size 50kg and 100kg and



will be supplied to the market in these bags. The steam that will be used for cooking/digesting the waste material will be recirculated after cooling it down in the cooling tower. The water loss resulting from natural evaporation during steam condensation and recirculation will be replenished by adding additional freshwater into the system.

In order to control the odour during cooking/digestion, the steam coming out of the cookers/digesters will be let to pass through water. For this purpose, a water tank will be constructed for letting the steam pass through it. The water will act as the odour absorbent material. Furthermore, the digesters will be installed deep inside the production hall so that any steam coming out from them does not find way to outer environment except to pass through the water seal and then to be discharged to the exterior through the chimney.

The only natural resource to be used during construction and operation of the project will be the freshwater, which will be used mainly for absorbing odorous steam as well as for washing the floors. Both fat melting and the protein recovery processes will neither require nor consume any other natural resources. Freshwater will be obtained through a groundwater pump, which will be installed anew before starting the construction work. Apart from some other minor uses, freshwater will be used primarily for four major activities at the facility. These uses will include: (i) as the drinking water for the labour and employees, (ii) as the primary agent for controlling odour by absorbing odorous compounds contained in the steam coming out from the pressure digesters/cookers, (iii) for making steam for the cookers/digesters, and (iv) for various other miscellaneous activities and human needs at worksite toilets and for irrigating the green areas. In order to ensure conservation in usage of water, the freshwater to be consumed in the cooling system and odour control system, will be re-circulated.

The production hall be fitted with heavy duty exhaust fans for keeping the inside temperature at a desirable level. The floors, particularly the incoming raw material receiving platform will be washed daily with water and detergent for removing dirt and grease. The washout will be drained to the septic tanks for treatment and only the treated wastewater will be discharged out.

2.10.2 Design and Layout Features

The proponent has not yet selected the final source for procurement of the cookers/digesters to be installed at the premises. However, the proponent intends to instal the locally fabricated machinery and equipment. Currently, the proponent is searching for the best manufacturer in order to be sure that the cookers/digesters fabricated by him are of standard specs and conform to the applicable PEQS.

2.10.3 Plant's Design and Layout Planning

The salient features of the design and layout of the plant will be as under:

- Incoming and outgoing gate with a guardroom fitted with an inventory recording system
- Parking area for the incoming carriage and personal vehicles
- Vehicle weighbridge (optional)
- Incoming raw material receiving and storage enclosure
- Cookers/digesters fitted with all essential equipment and control systems
- Cooker temperature monitoring and control system
- Steam circulation, capturing, cooling and recirculation system and equipment
- Cooked material removal and curing system
- Excess oil extraction equipment and system
- Packing, storing and dispatching system
- Onsite laboratory
- Other support equipment and facilities (e.g., generator)
- Fire safety and emergency control systems and facilities
- Admn building / office rooms
- Green areas, grassy lawns and tree plantations

The operation of the plant shall commence only after complete setting-up of the machinery, equipment and the odour control system under environmental approval from the EPA-Pb.

Nature: A plant for fat melting and protein recovery from pre-cooked animal fat and the discarded poultry waste.

Size: 27225 Sft (5 Kanals)



Location: The plant will be located at Chak 285/TDA Road, Tehsil and Distt. Layyah.

2.10.4 Environmental Considerations

As already mentioned, the quantum, magnitude, time of occurrence and the potential health and environmental effects will depend primarily on the quality, efficiency and performance of the plant. They will also depend to some extent to the management practices, as will be employed during the whole process. Nevertheless, subject to the above, following environmental hazards can arise:

- likelihood of soil and groundwater contamination from unscrupulous disposal of solid wastes *[this is not relevant to the instant plant, as there will not be the generation of any process or production related solid waste that might require disposal. The ordinary municipal waste will be disposed of through the waste disposal and management system of the local municipality].*
- Likelihood of wind dispersal of the particulate matter from the stored stock of the waste material waiting to be processed *[this not relevant to the instant project, as no poultry waste will be stored open. All incoming waste material will be stored as per the relevant SOPs and all requisite precautionary measures will be adopted in this respect. The proponent will ensure safe, secure and covered storage of all the waste material received at the plant].*
- Likelihood of atmospheric emissions during processing [cooking/digesting] of poultry waste and melting of fat, as received from different sources. *[this not relevant to the instant project, as heating of the contents of the cookers/digesters and the melting pans will be by pre-heated steam and not by direct fire. Hence, there will not be any emissions of hot flue gases. Furthermore, a proper system will be installed for capturing, cooling and reusing/recirculation of the steam condensate will be retrofitted].*
- Likelihood of incomplete cooking/digestion and generation of semi-cooked material. *[there will not be any likelihood of such an eventuality, as cooking/digestion will be done in the cookers of standard size, design and specifications under controlled pressure, temperature and duration of cooking. Nevertheless, if any less-cooked or semi-cooked material is detected, it will be re-cooked with the next batch].*
- likelihood of open storage of the cooked material *[there will not be any likelihood of such a happening, as all the cooked material i.e., protein granules, after preliminary curing, will be packed into appropriate bags and dispatched to outbound warehouse].*
- Likelihood of exposure of the workers to harmful substances *[this is not relevant to the instant plant, as all requisite safety, protection and mitigation measures will be employed at the plant under supervision of an Environmental Safety and Healthcare Unit].*

The operation of the plant will commence only after complete setting-up of the machinery, equipment and the pollution control system and that too under environmental approval from the EPA-Pb.

Currently, the site is a vacant land, owned and possessed by the proponent. The site is situated at Chak 285/TDA Road, Tehsil and Distt. Layyah. The site is open from all sides and there is no building or other structure at, near or adjacent to the site. The building and all other structures and facilities will be constructed in strict conformity with the applicable byelaws of the concerned building control authority. The setting-up of the plant and construction of the building will be only a physical activity, whereby various building construction materials (like bricks, sand, cement, steel and many others) will be used for construction of various structures, components and facilities in an environment friendly manner by observing and complying with applicable construction and safety standards. As the site is a vacant land and construction of plant will only be a small size physical activity, there will not be any environmental impacts of setting-up of the plant here.

As per findings of the EIAR, as are based on assessment and analyses of the team of environmental experts, there will hardly be any impact of setting-up of the plant here. However, there is a likelihood that operation of the plant might be associated with some environmental impacts, which have been discussed at appropriate places in this EIAR. Nevertheless, if any impacts of construction are discerned at some later stage, it is stated confidently that they all will be mitigable and of no environmental concern at all. Any other impacts if found, other than those identified and given in the instant EIAR, will be all mitigable by implementing the recommended mitigation measures and the environmental management and monitoring plan, as given in this EIAR. On the other hand, setting-up of the plant will be highly beneficial for the proponent, environment,



economy and the local community, as it will provide transfer of technology, opportunities of jobs, employment and earnings for the nearby and the distant communities.

The findings of the EIA further show that setting-up of the plant, for melting of animal-origin fat and recovery of proteins from the useless poultry waste through the process of cooking/digestion of the same, will be of immense advantage and benefit for the people, community and the environment. The findings of the EIA show that there will not be any unnecessary and or exhaustive exploitation and consequential depletion of the local natural resources from setting-up of the plant. Rather, setting-up of the plant will help in conservation of the resources, as none will be consumed in the operations of the plant. In view of the limited and calculated scope and magnitude of activities relating to setting-up of the plant, the local natural resources will remain conserved and available for sustainable future development. The setting-up of the plant will therefore bring positive and healthy improvements in the socio-economic environment and value system of the area. The setting-up of the plant will benefit thousands of persons, locally as well as distantly.

The premises will have a dedicated and an always ready-to-use firefighting system consisting of standalone fire extinguishers, as well as a centralized system, for the prevention and control of accidental fire at the premises. In addition to the firefighting system, personal protection equipment (PPE) shall be placed at appropriate locations at the premises.

2.10.5 General Design Features

The key components of the process/production area will comprise the following:

- Raw material [pre-cooked fat and poultry waste] receiving area
- System and equipment for the transfer, feeding and loading of the cookers / pans with raw material
- Cookers / digesters and the fat melting pans
- Steam supply, circulation, recapture, cooling and recirculation system
- Boiler (for steam generation and recirculation)
- System for the curing and packing of the processed material
- Outbound warehouse, and
- Other support facilities

2.10.5.1 Tipping Area

The tipping area will be the specific spot, where all incoming waste will be received first. In a typical unit like the instant one, the incoming waste is off-loaded from the carriage vehicles either onto a tipping floor or directly into a storage enclosure. Where the waste is placed on the tipping floor, it is subsequently transferred or fed directly into the cookers/digesters or the heating pans either manually or by mechanical means.

2.10.5.2 Storage Enclosure

The storage area will serve number of purposes, as under:

- Firstly, it will allow storage of an amount of refuse sufficiently large to ensure continuous operation of the plant @ 24-hr/day, 7-day/week, and 30-day/month.
- Secondly, it will provide an area, sufficiently large, where reasonable amounts could be placed and mixed to get a uniform consistency of the feed material.
- Thirdly, it will act as a safe area that will prevent interaction of the waste with the outside environment

2.10.5.3 Feeding/Loading Mechanism

From the tipping area, the raw material or poultry waste will be transferred or fed into the cookers/digesters and the melting pans from there to opening, either manually or mechanically through a conveyor belt or an overhead sliding crane, or by a front-bucket loader. The feeding/charging hopper will ensure a continuous feeding of waste into the cookers/digesters.

2.10.5.4 Cookers/Digesters/Melting Pans

The cookers/digesters and the melting pans will be the most important component of the whole system. They will be cylindrical structures made of ordinary mild steel with openings for feeding the raw materials and for taking out the cooked stock. The contents will be heated via hot steam jacket of pipes around the inner body of the cooker wherein steam will enter into the piped rings from one end and will leave from the other end continuously. There will not be any direct application of heat or fire. The size, shape and other features of the cookers/digesters and the melting pans will be as per the manufacturer's specifications, which in turn will be based on number of parameters, among which are the volume of waste load, retention time, temperature, pressure, steam flow rate and cooker's thickness and diameter.



2.10.6 Types of Cookers

Following are the few most common types of poultry waste cookers/digesters.

2.10.6.1 Mass Burn Cookers/Digesters

The mass burn cookers are used to cook large quantities of poultry waste in one go with steam circulating in the outer jacket to ensure efficient and complete cooking/digestion. They are designed to ensure minimizing the downtime for repairs. Wastes are put in from an opening atop the cooker. In a batched cooker, waste is loaded in a single batch and in a continuous cooker, it is fed into the cooker at a controlled rate. The drum of the cooker rotates around with the help of a gear to ensure continuous mixing and rotation of the contents in order to achieve uniform application of thermal energy.

2.10.6.2 Modular Cookers/Digesters

Modular cookers/digesters are the small units, with a capacity of 5 to 100 tonnes per day. They are generally prefabricated off-site and shipped to the site for installation. The onsite construction consists of a building with a tipping floor and other essential utilities.

The thermal energy is provided through steam produced by a boiler. The steam produced is at low to medium pressure. The steam must be upgraded to high-pressure steam if it is to be used for electrical power generation.

2.10.6.3 Fluid-bed Cookers/Digesters

In contrast to conventional cookers/digesters, the fluid bed cookers cook the wastes in a turbulent bed that keeps the contents in a continuous state of movement and agitation. The materials are kept in suspension by an upward flow of high velocity hot air from below the material. In this manner, the waste material is converted into a more homogenous material in order to ensure efficient performance of the whole process.

The efficiency of the fluid-bed cookers is better than the conventional cookers/digesters. Whereas, performance efficiency of the fluid bed cookers/digesters exceeds 99%, whereas it is 97-98% for the ordinary conventional cookers/digesters. The fluid-bed cooker operates at a lower temperature range than other types.

2.10.7 Performance of Cookers/Digesters

Regardless of their make, type, size, and construction specs, the performance and efficiency of a cooker/digester can be judged on the basis of certain parameters/criteria i.e., waste load, retention time, temperature, pressure and turbulence of the cooker's contents. If the data on these factors is available, it is possible to determine at what percent of capacity a unit will be operating.

2.10.8 Problems of Cookers/Digesters

The design of the modern fat melting and protein recovery facilities has become a very complex undertaking and can be challenging at times. Apart from high capital and maintenance cost, there may be some other problems associated with cookers/digesters. In addition to the above, there are, in particular, three specific problems that must be given special attention. These are:

- system availability
- fouling of heat transfer surfaces, and
- corrosion

Usually, the system availability is to the maximum only about 80%. The limitation on availability is mainly a result of the need to frequently clean the inner walls of the cookers/digesters that may become clogged with the sticky material and other contents of the feedstock. The frequency of the downtimes may necessitate a duplication of the equipment or installation of a parallel standby system. Almost all the heating surfaces are subject to fouling. This is caused by the deposition of slag and sticky particulate matter. This can be mitigated, to some extent, by modifying the digester design, addition of additives, through improvement and proper use of the cleaning equipment. Corrosion is a major technical problem in the operation of the digesters. It is usually caused by a reducing environment, which is not uncommon in the mass processing facilities. It is precipitated by the products of partial digestion.

2.10.9 Process Flow of the Operation

Fig.2.10.9 presents the process flow chart of the plant's operations. Annex-4 is a schematic of the manufacturing and production process.

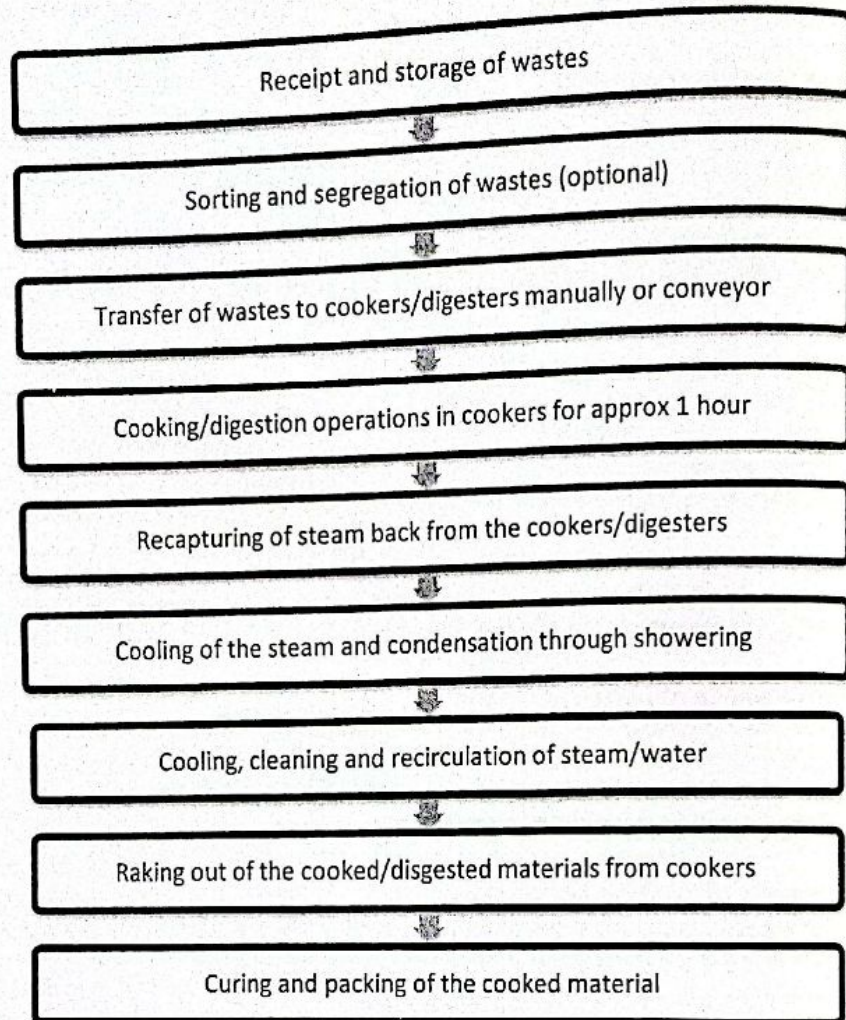


Fig. 2.10.9: Process Flow Steps of Waste Processing

2.10.10 Main Sections of the Plant

The plant will consist of the following components, systems or the functional areas:

- Ingress gate with a guardroom having an inventory recording system
- Parking area for the incoming carriage and personal vehicles
- Vehicle weighbridge (optional)
- Waste receiving and storage enclosure
- Cookers/digesters/melting pans fitted with all essential feed and control systems and equipment
- Cooker/digesters' temperature monitoring and control system
- Steam capturing, treatment and disposal system and equipment
- Contents removal and raking system
- Protein meal curing and packing system
- Outbound warehouse for storage and dispatch to market
- In-house laboratory
- Fire safety and emergency control systems and facilities

- Worksite toilets and washrooms
- In-house repair workshop
- Water supply, sewage, electricity and firefighting system
- Other support equipment and facilities (e.g., generator)
- Admin building / office rooms
- Green areas, grassy lawns and tree plantations

A brief description of each one is given hereunder:

a) Ingress gate with a Guardroom having an Inventory recording system

The premises will be encircled by a boundary wall all around. The height of the boundary wall will be as per the applicable bylaws of the local building control authority. Nevertheless, it will be sufficiently high to prevent climbing by criminal minded persons. It will be fitted atop with barbed wire fence. There will be a 14 feet wide single gate to provide ingress to all incoming and outgoing vehicles. A small size room (8'x6') will be constructed on one side of the gate. This room will serve as the security kiosk or guardroom as well as the inventory recording room. A complete log, manual as well as computerized, of all the vehicles coming in and going out from the plant will be recorded here. Likewise, data of all the visitors and the persons, other than the plant management and employees, will be recorded in the appropriate registers and the computer-based software. The trained security personnel will be available here round the clock.

b) Parking area for the incoming personal and carriage vehicles:

The premises will have a dedicated area for parking of the incoming personal and carriage vehicles. The space reserved in the layout plan seems sufficient for parking of the incoming vehicles. The parking site will be paved with tough tiles and will be kept neat and clean.

c) Vehicle weighbridge (optional)

Since, all the incoming waste will be weighed properly at the collection point, construction of an onsite vehicle weighbridge is not included in the first place. However, space will be reserved for the construction of a weighbridge, if needed, at some time later.

d) Waste receiving and storage enclosure

All incoming waste will be received and placed in a separate waste receiving enclosure of the dimensions 30'x20'x20'. The receiving enclosure will have separate compartments for the fat and the poultry wastes. The impurities [e.g., stone, dirt, metal and wood pieces etc.] in the waste will be removed manually and the cleaned waste will be transferred to production hall. The waste receiving enclosure will be covered by a roof and walls of appropriate height to prevent its contact with the rainwater. The waste receiving enclosure will be regularly disinfected with the recommended disinfectant.

e) Cookers fitted with all essential control systems and equipment

The cookers/digesters and melting pans will be fitted with all essential equipment, as described below:

f) Feeding conveyor

A rising roller conveyor with belt will convey the waste from the receiving enclosure to the cookers/digesters will be fitted with them, if the proponent opts for conveyor belt feeding system. The width of the conveyor belt will be from 18" to 24". The margins will be little raised to prevent falling down of the feedstock during conveyor movement. The latex rubber made belt will roll over cylindrical steel rollers, which will be a little inclined towards centreline of the conveyor. The length of the conveyor will be adjusted to provide a rising gradient angle of 30 to 45 degree. In addition to the main conveyor, there will be a standby conveyor to be used in case of breakdown of the main one. Both conveyors will be detachable and adjustable. The upper end of the conveyor will drop the waste material onto a receiving aperture of the cookers/digesters.

g) Feedstock receiving hole and window

The waste material will be first received at the inlet chute of the cookers. It will be an inclined steel plate with both the sides raised. The inclination angle will provide gravity sliding of the received material. The distal end of the plate will have a plate hinged above that will allow one-way transfer of the material from outside to inside the cooker body. The hinged plate will flap inside as soon as the waste material will push it. It will shut down immediately after dropping down of the feedstock into the cooker/digester. The receiving chute and window will be fitted atop each cooker/digester. Its size or diameter will be around 18".



h) Inner temperature monitoring and control system

The body of each cooker/digester will be fitted with temperature measuring probes or gauges. The probes will continuously measure the inside temperature of the cooker. The temperatures will appear on a display screen which will show the inner temperature digitally. A complete log of the temperature will be kept and maintained.

i) Steam capturing, cooling and condensate system and equipment

The unit will be fitted with an efficient and effective mechanism for the collection back of the used steam and its diversion to the system again and again. In order to remove any odour, the steam will be first passed through a water bed and then cooled down by a cooling tower. The steam condensate so obtained will be recirculated to the system for making the steam again. In this manner, the proponent will ensure highest level of water use conservation.

The boiler unit will be fitted with a vertical stack tower or chimney. It will be made of steel sheet. Its base will have a diameter of around 4' and the top mouth of around 1' diameter. Its height will be 30 feet. All the emissions from the boiler will be released through this chimney.

j) Contents collection and curing system

The steam induced cooking of the cookers' contents will produce the finished product i.e., recovered protein meal for usage as an important ingredient of the poultry feed. Once the cooking cycle is complete, the contents will be taken out of the cooker with the help of rakes. It will be allowed to cure and cool down.

k) In-house laboratory

The plant will have its own dedicated analytical laboratory for onsite quick analysis of the various environmental performance and efficiency parameters of the plant equipment. The laboratory will be fitted with all necessary, equipment, gadgets and machines for carrying out the tests and analyses.

l) Fire safety and emergency control systems and facilities

The plant will have its own dedicated firefighting and control system. In addition to the water-based fire safety system, there will be a parallel line of standalone foaming fire extinguishers. These standalone fire extinguishers will be placed at key locations throughout the premises. They will be ensured to be available and ready to use state round the year. They will be refilled with fresh gas, if the old gas is expired.

In order to ensure worksite personal safety, all workers will be provided personal protection and safety equipment (PPE). The PPE items will include the on-work apparel, antistatic shoes, gloves, helmets, masks, earplugs and goggles. The management will ensure that all the workers are wearing the right kind of apparel and the PPE, while on work. Cigarette and tobacco smoking will be strictly banned inside the plant premises.

m) Worksite toilets and washrooms

There will be a separate toilet and washrooms block located at one side of the premises where the workers and the staff members will attend call of nature and may take bath, wash their clothes and ensure personal cleanliness and hygiene.

n) In-house repair workshop

The plant will have a small in-house repair and maintenance workshop for carrying out minor routine and emergency repairs and maintenance of the machinery, equipment and other components. It will be fitted with all necessary tools and gadgets for carrying out repairs and maintenances.

o) Water supply, sewage, electricity and firefighting system

The premises will have its own water supply and sanitation system. The premises will have water storage tank of appropriate capacities for storing water to be used, whilst the pumps will be allowed to rest. The arrangement will ensure round the clock availability of water for human consumption as well as other needs. The electricity needs of the plant will be met from an industrial electricity connection to be obtained from LESCO. The proponent will construct septic tanks of appropriate capacities for treating the sanitation and wastewater. There will not be any process wastewater to be discharged to the exterior, except some surplus water from steam making and condensate system. The plant will be fitted with an updated and always ready to use firefighting system of standalone fire extinguishers placed at key points as well as a centralized firefighting network. This arrangement will effectively control the eruption and spread of any accidental fire.



p) Other support equipment and facilities (e.g., generator)

In addition to the cookers/digesters and the melting pans, the plant will have number of support facilities like the weighing machines, generators and computers etc. The standby generator will ensure power supply during breakdown or supply failure from the main power line. The generator will be euro-compliant and its noise and exhaust emissions will be regularly monitored. It will be kept in good running condition by ensuring its cleanliness, upkeep and tuning.

q) Admn building / office rooms

The premises will have an admn building block, which will comprise of the office rooms, washrooms, restrooms, guestroom and pantry. All the record and inventories will be available in the office in hard and electronic forms in the computer system. Proper and regular cleanliness of the admn offices and the entire premises will be ensured.

r) Green areas, grassy lawns and tree plantations

In order to improve the aesthetics, ambience and outlook, the premises will have dedicated and exclusive green areas, exotic floral plantation, shadowy trees and lush green grassy lawns. They will be regularly irrigated with the surplus discharge water from the steam making and recirculation system. A whole-time gardener will be employed to ensure proper look after, upkeep and pruning of the greenery.

The setting-up of the plant will be an environment friendly activity as there will not be any impacts of onsite construction of the building/structure. The machinery will be installed concomitant with civil work construction. A brief description of each of the sections or components is given as hereunder:

2.11 Restoration & Rehabilitation Plans

Not any restoration or rehabilitation plans required, mainly because of the following reasons:

- The machinery will be installed alongwith construction of the plant building
- The proponent will obtain necessary NOC regarding land use change to permissible usage
- The plant will be situated away from any human settlement, villages and towns
- There are not any vicinity houses, shops or other structures that might need to be demolished during setting-up of the plant
- Setting-up of the plant will not involve acquisition of any private land, as the land, held by the proponent is sufficient for setting-up of the plant
- There is no likelihood of displacement of any persons, as the plant will be constructed on a vacant land
- Setting-up of the plant will not involve displacement of any person or damage to any nearby property as none are existent within the zone of environmental influence of the site
- Construction of the plant will not involve cutting or removal of any trees or green plants
- The onsite setting-up of plant will not involve damage to any public or private infrastructure, as none are existent within the zone of environmental influence of the site
- Setting-up of the plant on a vacant land will not involve displacement of any persons or property. Hence, there will be neither any affected persons nor any issue of payment of compensation to them

Aggressive tree plantation, development of greenbelts and grassy lawns at and around the site/premises has been recommended for improving environmental ambience and aesthetics of the premises.

2.12 Government Approvals

Barring the environmental approval, for which the instant EIAR is being filed, following NOCs and Governmental approvals have been so far obtained.

Only the environmental approval from EPA-Pb is pending at the moment.



3

BASELINE ENVIRONMENTAL & SOCIOECONOMIC PROFILE

3. BASELINE ENVIRONMENTAL & SOCIOECONOMIC PROFILE

3.1 Baseline Environmental Profile

Description of the environmental settings (also referred to as "baseline", "existing", "background", or "affected environment") is an integral part of an environmental impact/environmental examination study. There are two major purposes of describing the environmental settings in an impact study, namely:

- To ascertain and evaluate the existing environmental quality, as well as environmental impacts of the alternatives being studied, including the no-action or no-project alternatives, and
- To identify environmentally significant factors or geographical areas that could preclude the development of a given alternative or alternatives

Additional purposes of describing the baseline settings include, but are not limited to, provision of sufficient information so that the decision makers and the study reviewers, who might be unfamiliar with the general location, may develop an understanding of the project needs and environmental characteristics of the area.

One of the significant environmental impacts of a developmental scheme would be the likely changes in the land use profile. If implementation of a developmental scheme involves massive conversion of agriculturally useful land into agriculturally or otherwise less useful lands or leads to deterioration of the ecological environment by substantially altering the land use pattern in a manner, which is less favourable for propagation of agriculture, then the resultant impacts can be labelled as deleterious and harmful for the environment. Conversely, if a developmental scheme envisages very little or negligible changes in the existing land use scenario or the new land usage is of superior nature, then the development is regarded an environment friendly activity to the extent of this parameter.

It would not be out of place to mention here that usually the format of an IEE/EIA is either project-specific or area-specific or a combination of both. Because of the nature of the project, the instant EIAR has been prepared according to the combination format. The baseline environmental conditions, therefore, have been described according to this format approach. The text following hereafter contains a description of the baseline characteristics of the area and the district, wherever relevant.

3.2 Studies and Surveys for Baseline Profile

The Team of Experts, in conjunction with the proponent and other concerned agencies, took-up various studies and surveys relating to the project, such as:

- Studies and investigations into the baseline environmental profile of the area, where relevant
- Physical, geological, hydrological, and topographic environmental surveys of area, where relevant
- Socioeconomic surveys of the area, where relevant
- Surveys about education profile and services in the area, where relevant
- Soil quality surveys and investigations, where relevant
- Water quality investigations and analyses
- Ambient noise profile in the vicinity of the site
- Social study surveys
- Surveys and interactive meetings with the neighbouring populations to know their understanding of the project and to solicit their specific concerns over the project, if any

The objectives of the social study surveys were:

- Finding out impacts of the project on education, health, hygiene, lifestyle and social value system of the workers and inhabitants within the project's zone of influence
- Any probable dislocation of the persons and property and removal of encroachments, if any from project's implementation, expansion or operation
- Assessing the prospects of employment and job opportunities and impacts on the economic portfolio of the beneficiary population in the area
- Ascertaining likelihood of cropping up of any social conflicts and sources of frictions with the neighbouring community or the locals
- Finding out any sources of social and physical nuisances for the project or the local community

The above-mentioned studies included visits and physical surveys of the sites and the nearby population within a radius of 1 km from the project. The social surveys were carried out through random selection of the beneficiaries and the stakeholders. The nearby residents and the businesspersons, being the important stakeholders, were consulted in particular to solicit their views over various aspects of the proposition. Direct interviewing and soliciting the requisite information by asking short questions was found the best mode of eliciting the requisite information. The collective public gatherings were found another effective mode of procuring the requisite information. By and large, the stakeholders and the persons, who were consulted during the study, appreciated setting-up of the plant as beneficial to them from all angles and aspects. The baseline lab investigations are available as an annexure in the instant EIAR.

3.3 Environmental Description of the Site/Area

For the purpose of environmental description, a concentric area upto 0.1 km from centre of the site was taken as the project's assumed zone of environmental influence (Fig. 3.3). The plant will be setup on a vacant land situated on Chak No. 285/TDA, Chowk Azam, Tehsil and District Layyah. All essential and basic infrastructure like roads, electricity, natural gas, freshwater supply system, sewerage, drainage and sanitation system, solid waste management system and alike area available nearby. The proponent will also construct a wastewater treatment plant (WTP) for the treatment and disposal of the liquid wastewater, if so required and warranted. Currently, the site is a vacant land without any superstructure on it. Fig. 3.3a to 3.3i are the real time pictures of the site prior to initiation of construction and Fig. 3.3j to 3.3r are the real time Google Earth imageries of the site. The geographical coordinates of the site are 30°59'51.7"N 71°09'54.8"E, an altitude of 143 meter above sea level. The site is accessible through Chowk Azam Road, and in turn to various other destinations via the existing roadway network of the country.

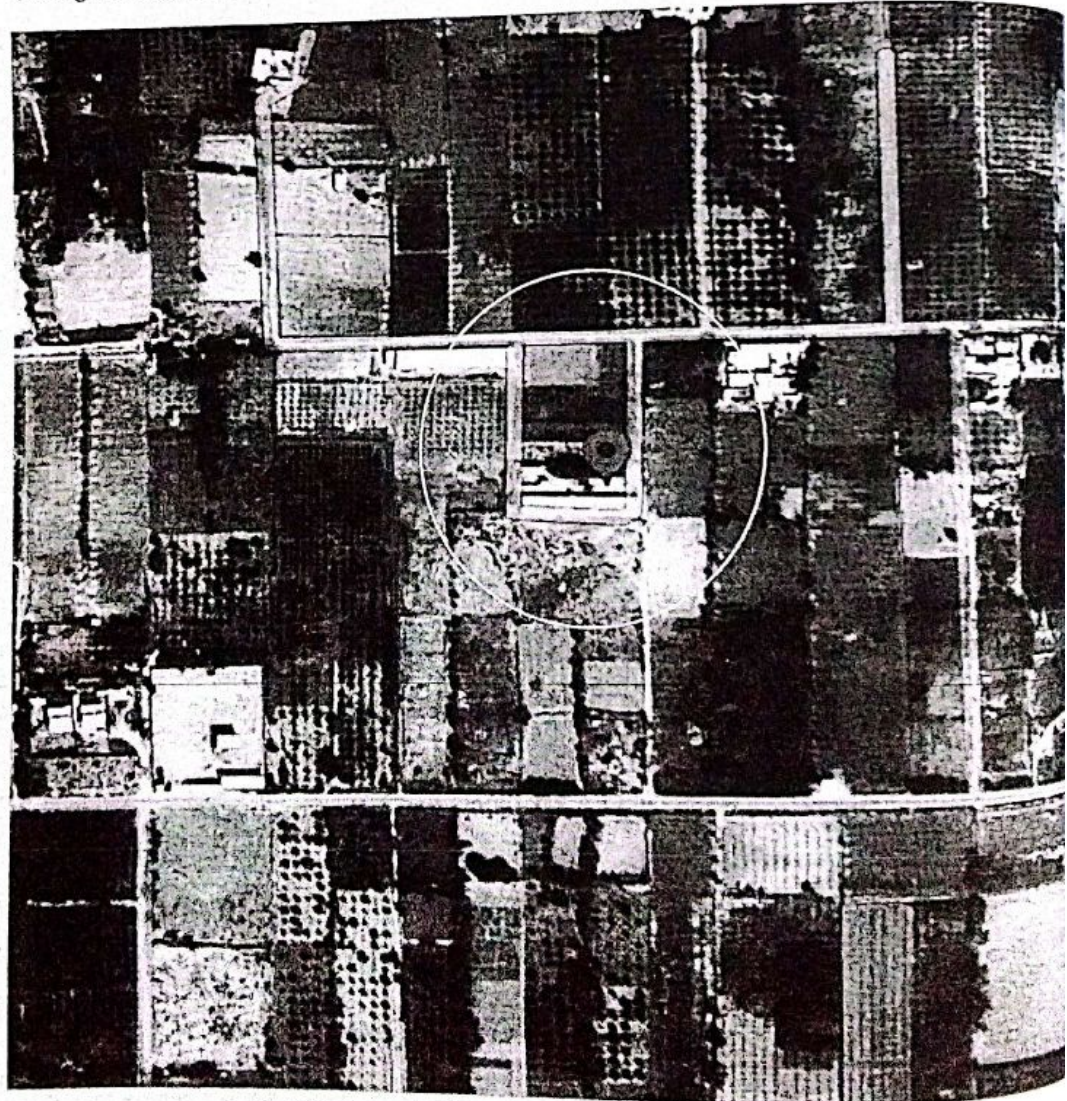


Fig. 3.3: Assumed Zone of Environmental Influence of the Site

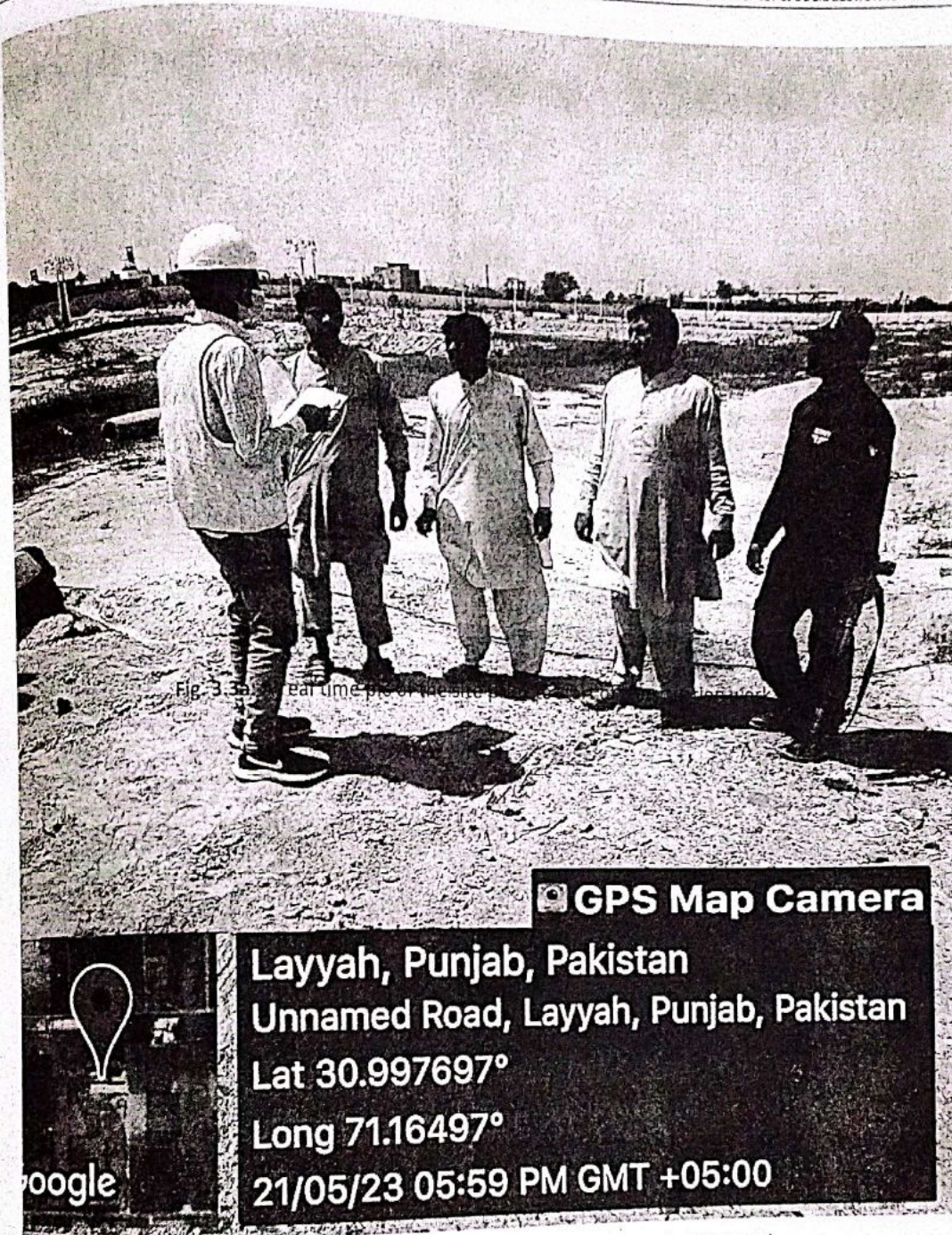


Fig. 3.3b: A real time pic of the site prior to start of construction work

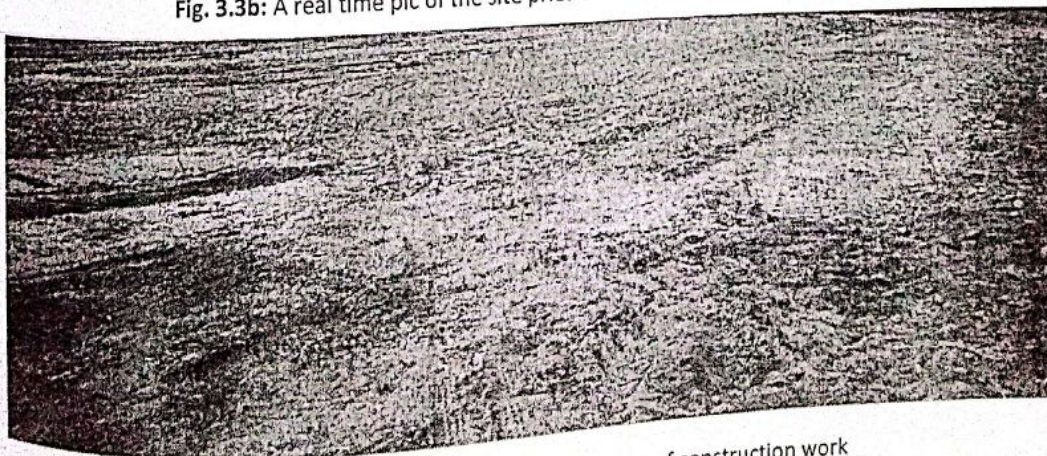


Fig. 3.3c: A real time pic of the site prior to start of construction work

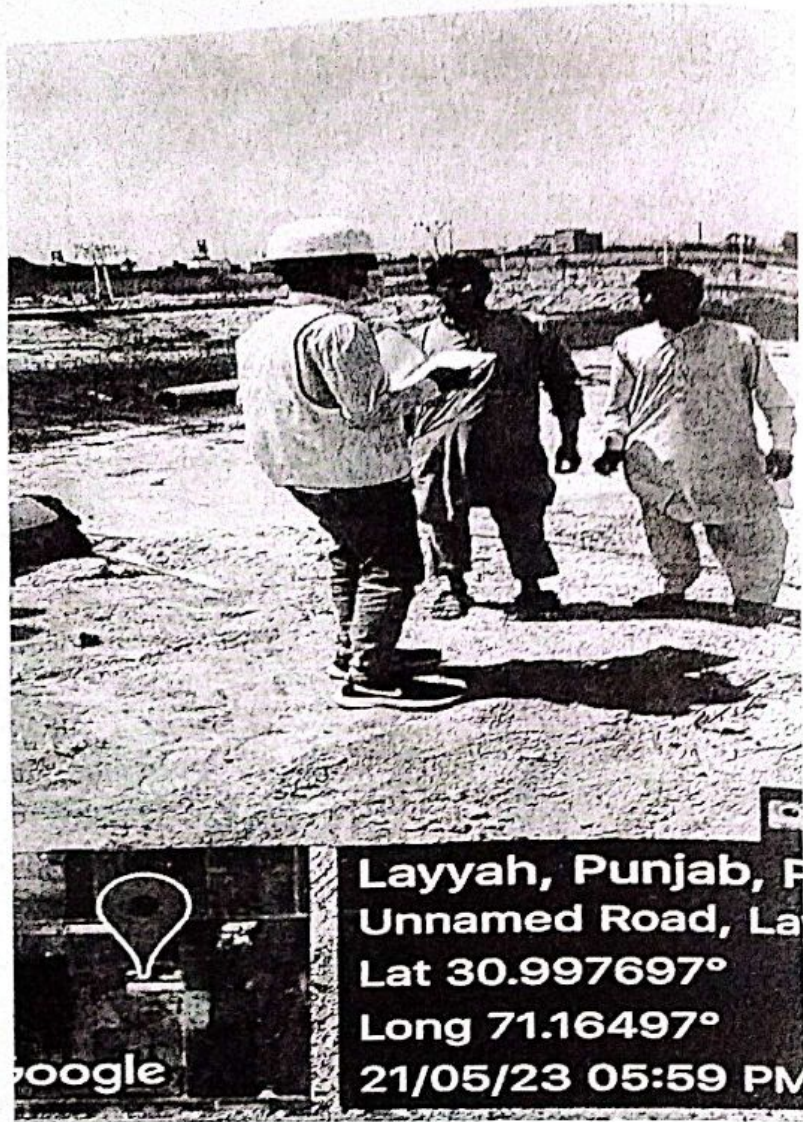


Fig. 3.3d: A real time pic of the site prior to start of construction work



Fig. 3.3e: A real time pic of the site prior to start of construction work

EIAR: Setting-up of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit", Chak 285/TDA, Distt. Layyah
 Green Revolution, 2023

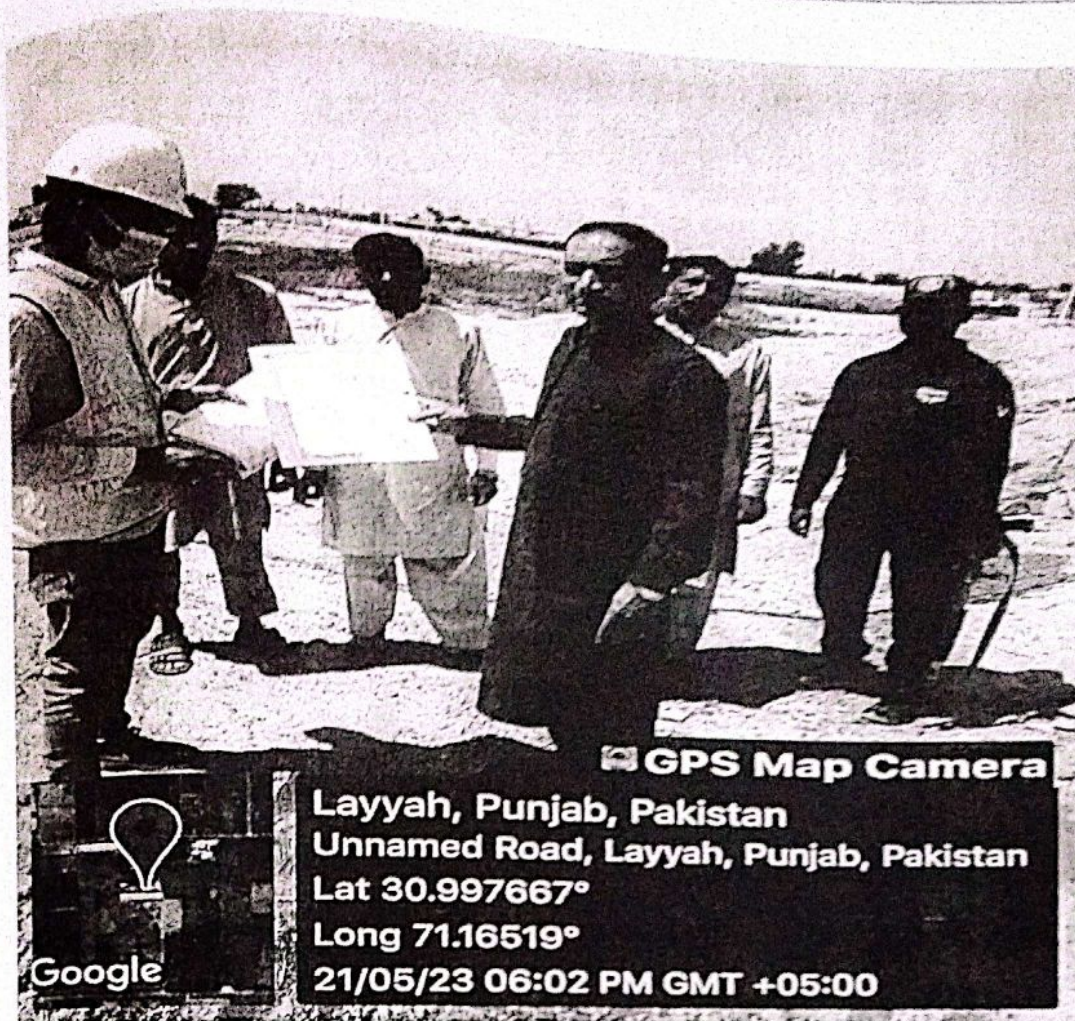


Fig. 3.3f: A real time pic of the site prior to start of construction work

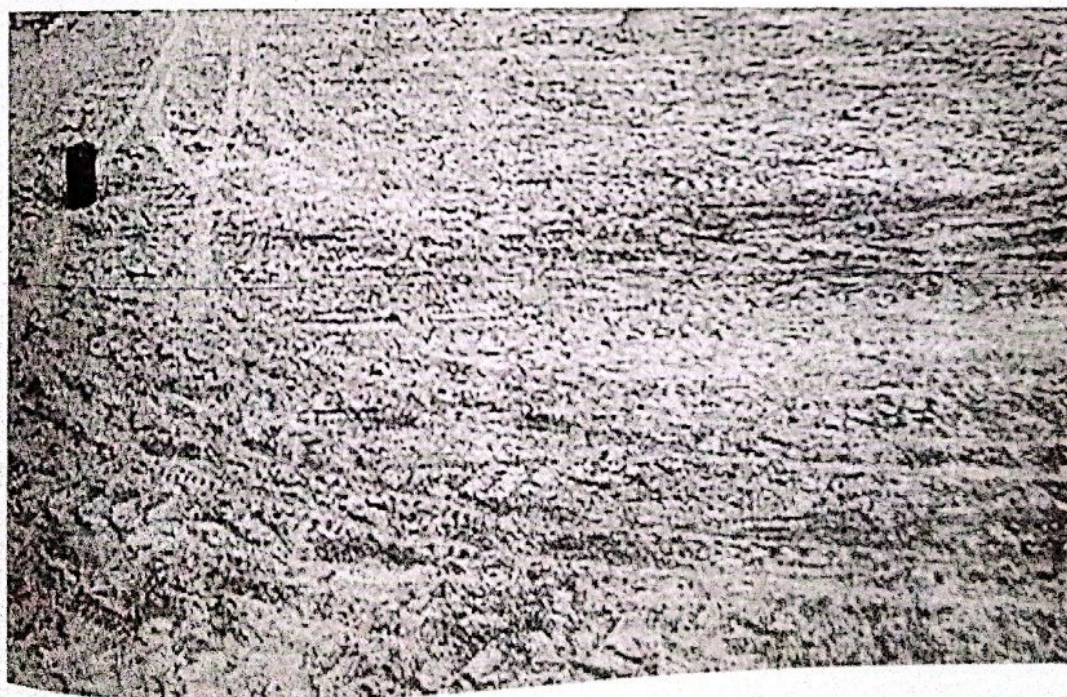


Fig. 3.3g: A real time pic of the site prior to start of construction work

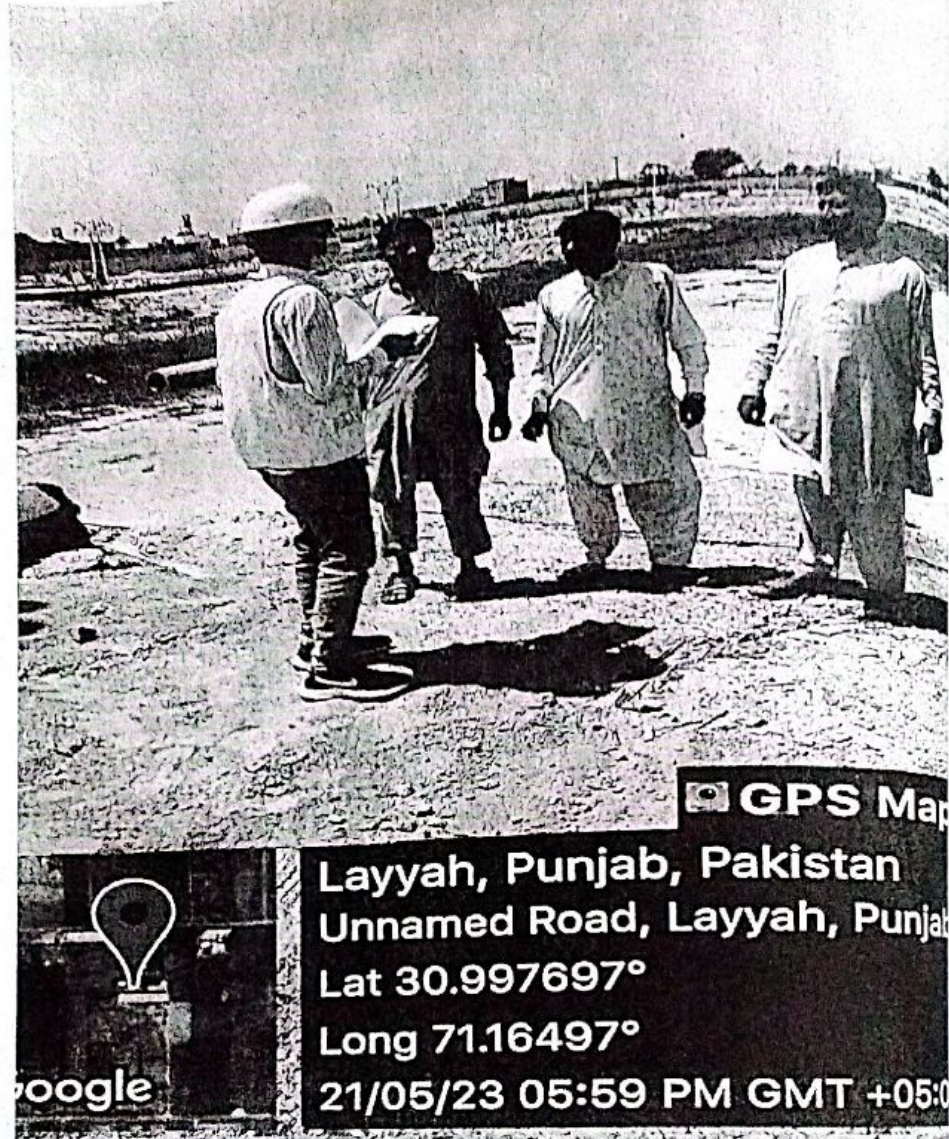


Fig. 3.3h: A real time pic of the site prior to start of construction work

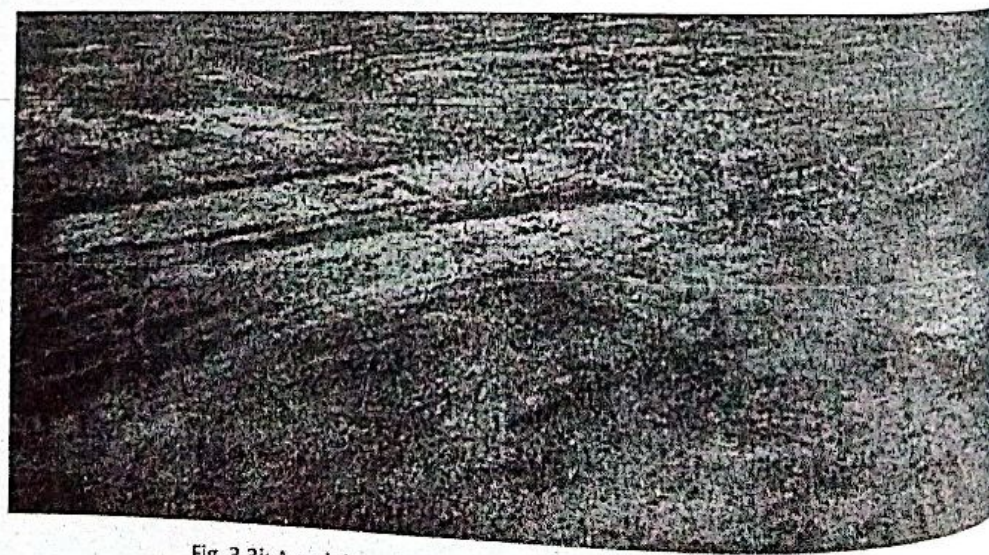


Fig. 3.3i: A real time pic of the site prior to start of construction work

EIAR: Setting-up of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit", Chak 285/TDA, Distt. Layyah
Green Revolution, 2023

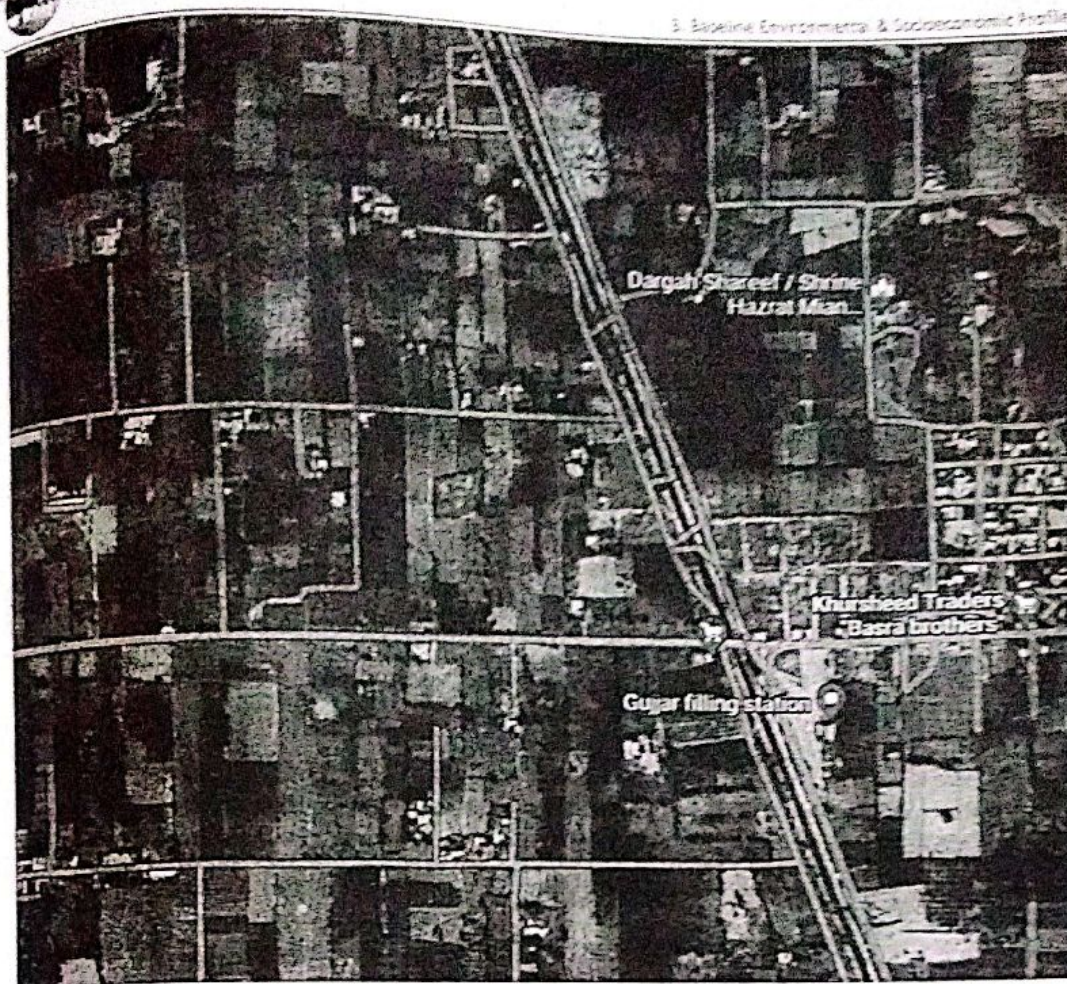


Fig. 3.3j: A Google Earth Imagery of the Site



Fig. 3.3k: A Google Earth Imagery of the Site

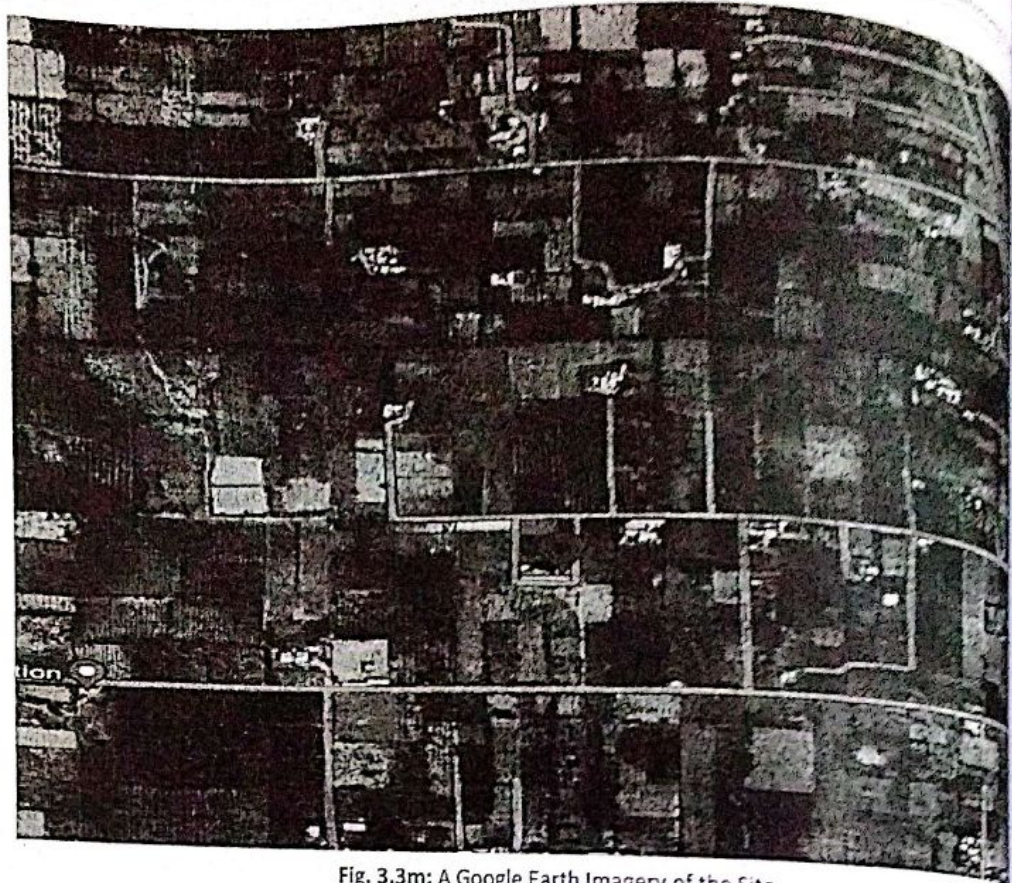


Fig. 3.3m: A Google Earth Imagery of the Site

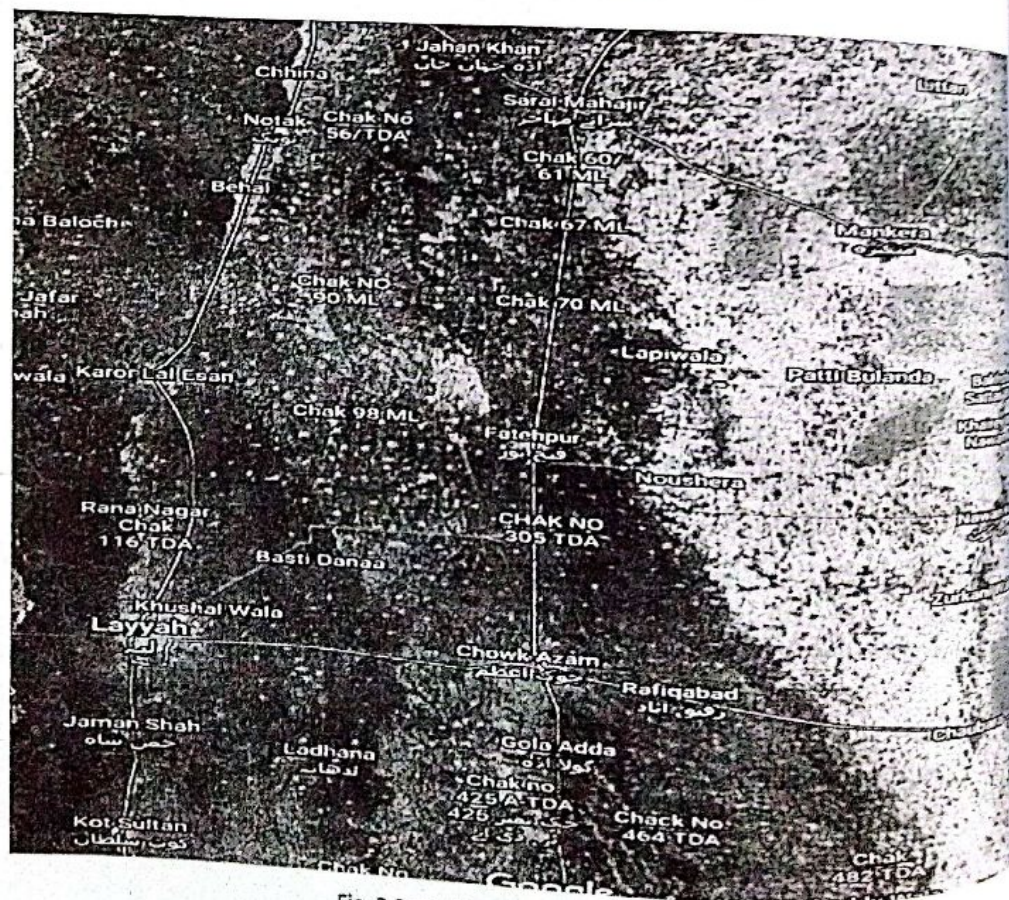


Fig. 3.3n: A Google Earth Imagery of the Site

EIAR: Setting-up of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit", Chak 285/TDA, Distt Layyah
Green Revolution, 2023

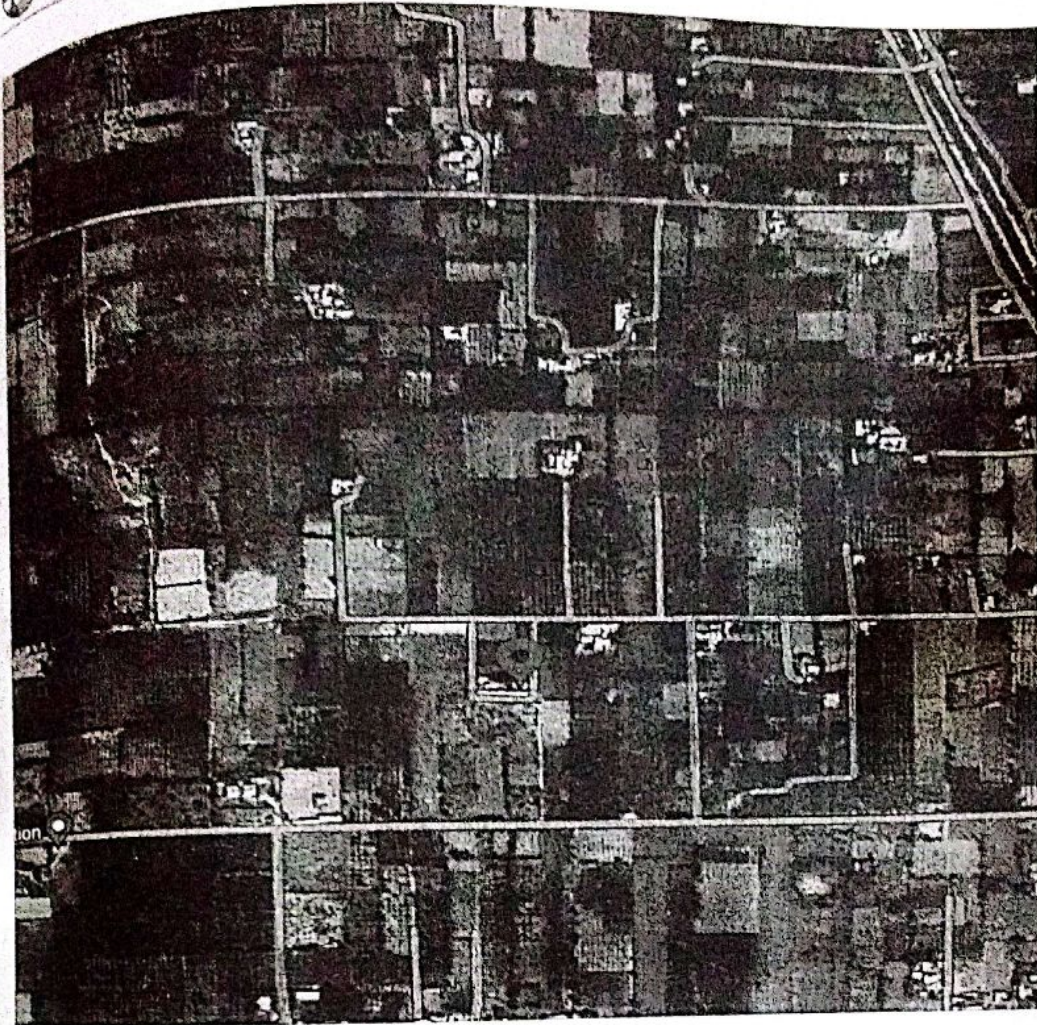


Fig. 3.3o: A Google Earth Imagery of the Site

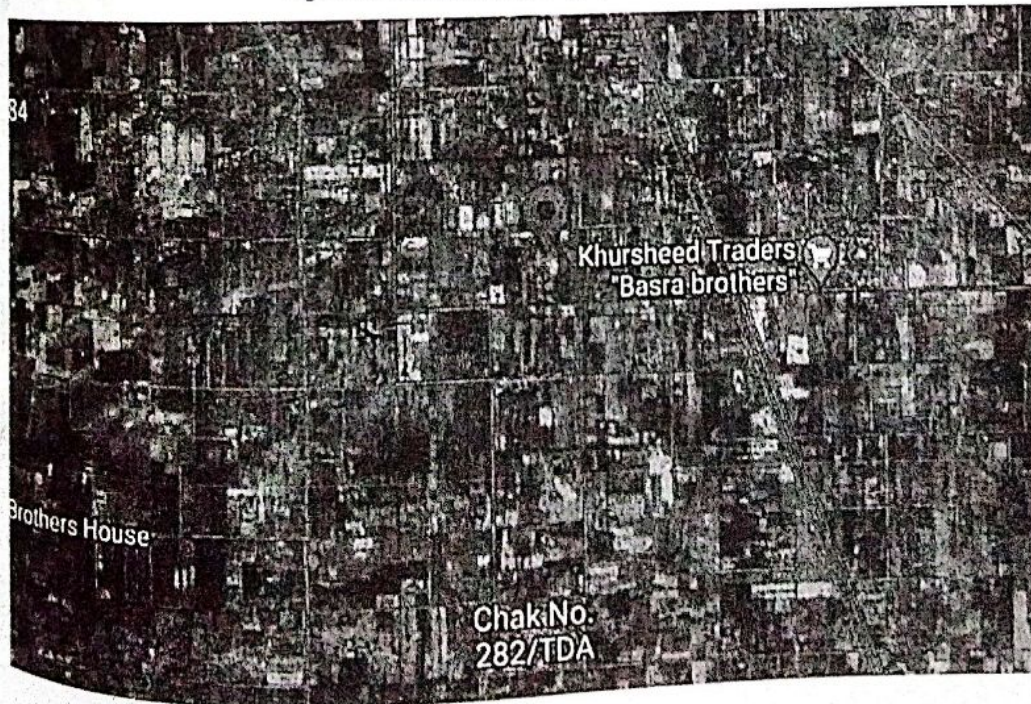


Fig. 3.3p: A Google Earth Imagery of the Site



Ghumman super mart



Mian Solar Pannel



Peace To Life Foundation



Dargah Hazrat



Al Makkah Super
Khursheed Traders
"Basra brothers"



Chak 285 (TDA)

Munda Tal
Branch

SAHARRA FARMS



Natural

Chak No



Fig. 3.3r: A Google Earth Imagery of the Site

3.4 Geophysical Environment

The geophysical environment is that part of the overall environmental profile of an area that relates to geological and physical entities in the area under study (the assumed radius of influence of the project in the instant case). Amongst number of various other parameters, the description of the geophysical environment includes, in particular, the narration of the site, location of the site, geology, hydrology, meteorology and atmospheric features of the site and the surrounding areas.

3.4.1 The District¹

Layyah is an ancient land situated on the eastern (left) bank of river Indus. It is bounded on the north by districts Bhakkar and Dear Ismail Khan; on the west by district Dera Ghazi Khan and river Indus and beyond that Suleman Range; on the south by District Muzaffargarh; and on the east by district Jhang.

The ancient history of Layyah is not very much known. It probably remained under the suzerainty of Ashoka. It is claimed that Layyah somewhat flourished under the Mughal rule, particularly during the reign of Emperor Akbar. Upon decline of the Mughal power, Nadir Shah occupied the region for some time, followed by Afghans. Shah Durrani, whose armies frequently invaded India. After the decline of the Mughal Empire, the Sikh invasions

¹ Wikipedia

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and occupied Layyah. In 1846, the region came under control of the British, like rest of the Punjab, who started settlement of land here.

Geographically, District Layyah is located in the western part of the Punjab. The district is predominantly an agricultural district. However, it is reasonably industrialized. The local industry produces sugar, cement, handmade tiles, furniture and cloth. The district is also famous for the production of fine quality pulses and herbs. Owing to its proximity to the mighty Indus, the district consists of plain lands made of alluvial deposits brought down by the river. The soil is therefore extremely fertile. There are no special geographical features of the district worth mentioning, except that part of Thal Desert lies in Layyah.

The City of Layyah has considerably expanded during the recent years. The signs of expansion are visible along the outer rim of the city, where agricultural lands interpose with new constructions, inhabitations, and farmhouses². Layyah is connected to other parts of the country via railway and roadway network. The approach road of the site provides a direct link of the site with the Layyah city and other destinations around.

Layyah is playing a pivotal role in country's economics and politics. There are number of technical and vocational training institutions that are imparting training in various trades e.g., mechanical, electrical, auto-engineering, welding, woodworking, and commerce. Vocational Institutions for women are imparting training in hand and machine embroidery, stitching, and knitting. Sugarcane, wheat, and rice are the main crops of the district. Maize, jawar, bajra, cotton, moong, masoor, mash, and oilseeds, are also grown, but on a much smaller scale. Guava and citrus are the main fruits grown in the district. Mango, banana, leechi, jaman, and falsa are also grown in small quantities. The vegetables grown in the district include potatoes, carrot, cauliflower, and salad leaves. Tomato, onion, turnip, peas, chilly, and garlic are also grown in smaller quantities. District Layyah occupies an important position in the agriculturally rich and fertile area of the province commanded by the surface irrigation system of the Punjab.

After independence of Pakistan in 1947, many Muslims from India migrated to and settled in district Layyah. The predominantly Muslim population of the district supported the All India Muslim League and Pakistan Movement. After the independence of Pakistan in 1947, the minority Hindus and Sikhs migrated to India while the Muslim refugees from India settled here. Sheikh, Sayed, Qazi, Awan, Tarar, Theim, Bhatti, Kharal, Khokhar, Lali, Sipra, Nesoana, Seehar, Sivag, Dahar, Mohal and Cheema are the leading tribes of the district.

3.4.2 Site Location

The site is situated on 285/TDA Tehsil & District Layyah. All essential infrastructure, facilities and amenities like electricity, freshwater supply system, sewerage and drainage system, natural gas and security area available nearby. The site is a good choice for setting-up the plant here, as the following facilities and advantages are available here:

- Good road network
- Sewerage system
- Electricity distribution system
- High pressure gas pipelines
- Potable water
- Telecommunications system
- Computerized weigh station
- Informatory signage
- Mosques
- Petrol stations
- Social security and healthcare system for workers
- Civil Defence post and system

3.4.3 Geography

The site is bound on all sides by open and vacant plots except on the north, on which side it abuts the Chowk Azam Road, that provides the direct access to the site.



3.4.4 Topography

Topographically, the site is a vacant and unused land and available for taking up construction of the plant. The site being in the command of river Indus and being a part of the floodplains of the Punjab, falls in the montane zone of Himalayan foothills. This zone is characterized by flat lands mixed with some dry areas and bars. As such, the topographic features of the site are a reflection of the general topography of the floodplains. Being an outpocket of the typical of flat floodplains of the central Punjab, the site like the floodplains is devoid of any significant topographic features. It may be interesting to mention that the development of an extensive irrigation network on these flat floodplains has facilitated large-scale cultivation. The general surface gradient of the area is from north to south and from west to east with a gentle slope of 0.2 to 0.3 m per kilometre³. According to the topographic imagery, the elevation of the site is 212m above the sea level⁴. The most important natural surface water channel of the area is river Indus, which is the biggest rivers of the Indus Riperian System. It is noteworthy that under the Indus Water Treaty of 1965, the waters of the three eastern rivers (Ravi, Sutlej and Beas) have been given to India and the waters of the three western rivers (Chenab, Jhelum and Indus) have been given to Pakistan. The area being an irrigated floodplain, there are numerous irrigation channels and wastewater drains spread all over the wider area around the site. Apart from the above given description, the area does not exhibit any other special physical, geological and geomorphologic features.

3.4.5 Geology

Geologically, the lands at the site are made up of alluvial deposits of clay, sand and loam. The lands of the floodplains of the Indus, of which the site as well as the site is a part, are mantled lightly with alluvial deposits that were transported from the Himalaya foothills over the centuries. The underlying bedrock is composed of the Precambrian metamorphic to the tertiary consolidated rocks. The overlying alluvium consists of Pleistocene to recent unconsolidated deposits of sand, clay and silt. The formation age of the alluvium ranges from Pleistocene to recent times, the latter being prominent near the riverbanks and the former around the central portions of the plains⁵.

3.4.6 Seismology

According to the Seismic Survey Map of Pakistan, Layyah falls in the seismic zone, which has the seismic activity equivalent to zone "2A" of the Earthquake Zones Classification of the United States Uniform Building Code, 1997 (UBC-97). This zone is associated with unknown geological conditions and the reported earthquake damage is "moderate". Nevertheless, earthquakes of magnitude up to five on the Richter scale which generate ground acceleration up to 0.1 g, have been reported for this zone⁶. No major earthquake has been reported during past two decades in the district⁷. According to Pakistan Building Code of 2007, district Layyah falls in Zone-4⁸ of the seismic zoning map of Pakistan. This zone has very low seismic activity.

3.4.7 Soil Morphology

By their very nature and composition, the soils at the site are contiguous with soils of the wider area and are granular to amorphous mix of sand, silt, clay, and loam. The texture, morphology, and moisture holding capacities of these soils show some intrinsic variations as one travels from north to south and from east to west. Generally, the soils in the Indus floodplain comprise relatively older alluvial deposits brought by the mighty Indus and its tributaries. The site is no exception to the same. The soil crust is composed of alluvial deposits consisting of silt, clay, sand, and loam. Clay and silt formations occur in discontinuous layers with limited lateral extent. Their thickness is generally less than five meters⁹. Because of presence of a surface irrigation network, fertility and the yield per acre of the soils is good¹⁰.

3.4.8 Surface Hydrology

River Indus is the major surface water channel of the area, but is located far away from the site. Under the Indus Water Treaty, waters of the three eastern rivers of the country (Ravi, Beas, and Sutlej) have been given to India, whilst those of the western rivers (Indus, Jhelum and Chenab) have been given to Pakistan.

³ Geological Features of Punjab, Lecture Notes, Dr. M Nawaz Ch., Punjab University, Lahore
⁴ Topo-sheets of District Layyah, Survey of Pakistan, 2022

⁵ Geological Survey of Pakistan <www.gsp.com.pk>

⁶ Geological Survey of Pakistan <www.gsp.com.pk>

⁷ Geological Survey of Pakistan, www.gsp.gov.pk

⁸ http://www.pec.org.pk/buildingcode.aspx

⁹ Punjab Sustainable Development Strategy, EPD, Final Report, 2008

¹⁰ Punjab Sustainable Development Strategy, EPD, Final Report, 2008

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River Indus is the largest freshwater body of the area. It is the largest river of the Indus Basin followed by Chenab. Plate 3.4.8 presents layout of the Indus basin system.

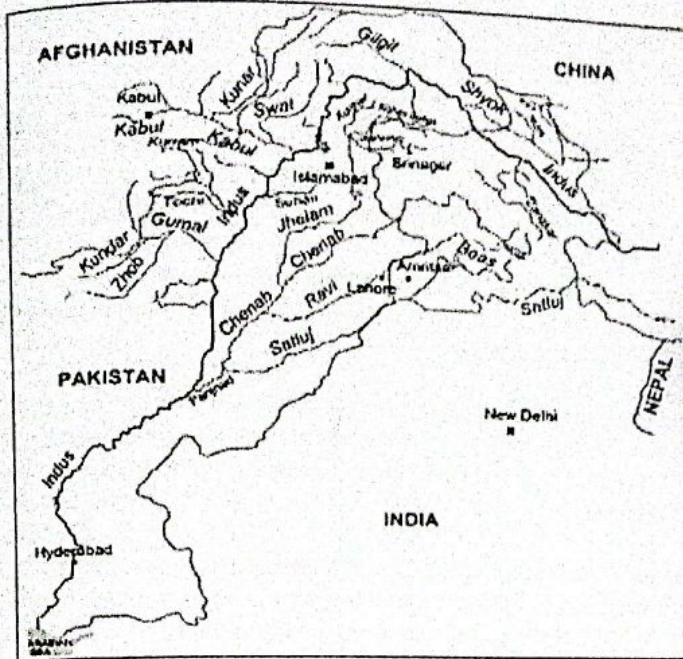


Fig 3.4.8: Layout of the Indus River Basin

The pollution of surface waters in Pakistan is assuming serious proportions, because the untreated industrial and municipal effluents are thrown into the nearby rivers with impunity. This problem is more conspicuous in case of the three eastern rivers because of lesser volume and lower flow of the river water. The dilution of the poured-in untreated raw sewage direct into the river waters, especially near the city reaches, has been producing alarming pollution of the river waters is therefore quite lower. As a result of the unscrupulous pouring in of the effluents, the water quality of the rivers has been deteriorating. The canals are not saved from the nuisance of direct pouring of raw sewage. Table 3.4.8 presents typical physical and chemical quality of the surface waters of the area.

It may be mentioned as a passing reference that pollution of surface waters in Pakistan has assumed serious proportions as the untreated industrial and municipal effluents are thrown into the nearby rivers with impunity. This problem is more conspicuous in case of the three eastern rivers because of lesser volume and slow flow of the river water. The pouring of untreated raw sewage direct into the river waters, especially near the city reaches, has been producing alarming pollution of the river waters. As a result of the unscrupulous pouring in of the effluents, the water quality of the rivers has been deteriorating. The canals are also not saved from this nuisance of the direct pouring of the raw sewage into them.

Table 3.4.8: Surface Water Quality of the Area

Sr.	Parameter	Unit	Results
1.	Alkalinity	m.mol/l	7.11
3.	Calcium	mg/l	50
5.	Hardness	mg/l	375
7.	Nitrate	mg/l	1.69
9.	Sulphates	mg/l	121
11.	Turbidity	NTU	0.8
13.	Total coliform	In 100 ml	5 - 8

Sr.	Parameter	Unit	Results
2.	Bicarbonates	mg/l	369
4.	Chlorides	mg/l	51
6.	Iron	mg/l	0.07
8.	Phosphate	mg/l	0.28
10.	TDS	mg/l	780
12.	pH	--	6.9
14.			

3.4.9 Groundwater

Owing to its location in the floodplain of the Punjab and because of proximity to river and canal waters, the rate of groundwater recharge through downward infiltration in the area is reasonably fair. The groundwater system at the site is in flux with the recharge occurring from downward infiltration of river and canal waters to the aquifer beneath. Infiltration from precipitation runoff is another source of groundwater recharge¹¹. Water



table in the area was hit at a depth of around 30~35 metres¹². There are number of groundwater turbine water pumps and hand pump installed in the wider area around the site. It may be added as a passing reference that abstraction of groundwater by hand pumps is fast declining mainly because of persistent lowering water table. Motorized pumps have replaced the hand pumps, as they are much more convenient to operate. The general quality of the groundwater of the site is satisfactory and conforms to the WHO Guidelines for potable water.

The groundwater at the site, like the wider area of the district, is in flux with the recharge occurring from infiltration of the river and the canal waters as well as from the surface precipitation. River Chenab flows along the eastern side and River Jhelum flows along western side of the district and are a source for recharge to groundwater in the area, particularly after heavy rainfalls and floods. Owing to the natural east to west topographical gradient, the groundwater of the region and of the site per se exhibits the flow characteristic conformant to area's topography. As per water quality inspection, the groundwater is of good potable and irrigable quality with no visible impurities.

Government has installed reasonable number of tubewells in the district for drawing up and supplying groundwater to domestic and commercial consumers. As there is deficiency of the canal irrigation water, many of the landowners in the area have installed their own tubewells privately for abstracting groundwater to cater for their groundwater needs.

The common modes of groundwater abstraction include hand pumps, tubewells and turbines. As reliability of the canal water for irrigation, owing to various factors, is not of the desired level, the district has a large number of tubewells, both in the public and in the private sector, for extracting groundwater primarily for agricultural needs but also for other uses such as domestic consumption and industrial needs. The number of the existing tubewells and the pace of groundwater abstraction exhibit the aquifers to be of reasonable reserve. It will be pertinent to mention that tubewell irrigation is the second major mode of irrigation in the province. According to "Agricultural Statistics of Pakistan", irrigation by tubewells accounts for nearly 30% water consumption for agriculture¹³.

According to Bureau of Statistics, Government of Punjab, there exist 44,995 tubewells in the district. The number of tubewells was around 14,120 in early eighties. Thus, tubewells have approximately tripled in about 40 years¹⁴. The proposed site and its surrounding areas are both canal and tubewell irrigated. According to hydrogeological mapping of the area, the groundwater yield in the vicinity of the site varies between 50-100 m³/hr down to the 150m and the aquifer is moderately thick and extensive¹⁵. Table 3.4.9a, 3.4.9b & 3.4.9c present respectively the number of tubewells, typical groundwater quality, and microbiological quality of groundwater of the district¹⁶.

Table 3.4.9a: Number of Tube wells in the District

Total			Diesel			Electric		
Pvt.	Govt	Total	Pvt.	Govt	Total	Pvt.	Govt	Total
44971	44	44995	44801	1	44802	170	23	193

Table 3.4.9b: Groundwater Quality of the Site

Sr.	Parameter	Unit	WHO Desirable Level	WHO Max Permissible Level	Remarks
1.	Temperature				
2.	pH	--	7.0~8.5	6.5~9.2	
3.	Odour	--	Unobjectionable		Odour
4.	Colour	P.C.U	05 Units	50 Units	Colour
5.	Taste	--	Unobjectionable	Unobjectionable	Taste
6.	Turbidity ppm Silica Units	NTU	05 Units	25 Units	
7.	Total Dissolved Solids	--	500	1500	
8.	Calcium as Ca ⁺⁺	ppm	75	200	
9.	Magnesium Mg--	ppm	50	150	
10.	Total hardness as CaCO ₃	ppm	100	500	

¹² Geotechnical Investigations of the Site

¹³ Agriculture Statistics of Pakistan, Ministry of Agriculture, Islamabad, 2022

¹⁴ Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

¹⁵ Hydrogeological Map of District Layyah, WAPDA, 2022

¹⁶ Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

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13.	Total alkalinity as CaCO ₃	ppm			300
12.	Sulphate as SO ₄	ppm	200	400	180
11.	Chloride as Cl	ppm	200	600	99
14.	Conductivity at 25°C	µs/cm			1160

Table 3.4.9c: Microbiological Quality of Groundwater of the Site

Sr.	Parameter	Results
1.	Total plate count/ml	NA
2.	Total coliforms (MPN/100 ml)	NA
3.	Faecal coliforms (MPN/100 ml)	NA

3.4.10 Meteorology & Climate

The site is a part of district Layyah. The district per se is located in the far south plain lands of the province. The overall climate of the site and of the district is generally dry with scanty rainfall. Summers are very hot with little or no rainfall. Winters are extremely cold. The mean winter temperature (December / January) ranges between 6.5°C and 10.5°C. The mean summer temperature remains around 39°C with frequent spells crossing 44°C. The mean of the maximum temperature ranges between 29-30°C and mean of the minimum ranges from 19 to 20°C. Spring and autumn seasons are the most pleasant parts of the year and full of colourful activities. The average annual precipitation in Layyah for the past 10 years (2010-2020) has been 229 mm. The wind flow is gentle during most of the year with occasional and sporadic dust storms during the peak summers. The past climatic records show that rain rich years occurred at a cycle of 15-20 years with an intervening dry period in between¹⁷.

The cropping cycle of the area is divided into a dry period called "rabi", which extends from October to March and a wet one called "kharif", which extends from May to October. Substantial part of the annual precipitation (approx. 50% of annual total) occurs in July and August¹⁸. The meteorological and climatic features of the site are as given in Table 3.4.10.

Table 3.4.10: Climatic Features of the Area

Sr.	Parameter	Value
1.	Classification of Climate	Hot humid (Tropic)
2.	Wind Intensity	Weak to moderate
3.	Rainy Season Duration	July to September
4.	Average Temp (Annual)	19-20 °C
5.	Average Temp (Winter)	6.5-10.5 °C

Sr.	Parameter	Value
6.	Wind Direction	East/Southeast
7.	Average Rainfall (annual)	<229 mm
8.	Dry season Duration	October to June
9.	Average Temp (Summer)	36-38 °C
10.		

3.4.11 Air Quality

Owing to predominately rural settings of the area, the general air quality of the site and that of district itself is good and meets the ambient air quality standards of Pakistan as well as the Air Quality Guideline Values of the WHO except for the particulate matter and the dust¹⁹. Due to movement of light and heavy traffic vehicles on Chowk Azam Road, the level of the fugitive dust in the area is relatively a little bit higher than the deeper area, away from the road. Since the plant is situated on a main road, the level of the resident dust here is a bit higher than the surroundings, but the optical visibility is satisfactory. Because of this disposition, the air quality profile is reasonably good with low levels of dust and pollutants. No evidence was found of contribution of pollutants to the local air from stack emissions from the local industry, brick kilns and other stationary sources, as none were found existing in the area. At the time of visit inspection of the site, the general atmosphere at the site was found clear from particulate dust and had good visibility.

The air quality profile of the country particularly that of some major urban centres shows concentrations of some of the air quality parameters higher than the WHO Guideline Values as well as the prescribed Punjab Environmental Quality Standards (PEQS). According to a joint air quality investigation of the major districts in the country by the Pak-EPA and the Japan International Cooperation Agency (JICA), the average suspended particulate matter (SPM) in the study districts was 6.4 times higher than WHO Guideline Values.

The levels of sulphur dioxide, carbon monoxide, and oxides of nitrogen also exceeded the acceptable standards in some areas, but the average levels were below the Guideline Values²⁰. Another similar study

¹⁷ Based on data obtained from Pakistan Meteorology Department, Lahore

¹⁸ Based on data obtained from Pakistan Meteorology Department, Lahore

¹⁹ Monitoring of Air Quality in the Punjab EPD

²⁰ JICA Investigation of Air and Water Quality (Lahore, Rawalpindi, Islamabad), JICA/Pak-EPA, 2001

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revealed higher concentrations of SPM in the ambient air²¹. However, barring congested urban centres, the quality in rest of the province generally conforms to WHO Guideline Values²². Table 3.4.11 presents the ambient air quality profile of the area.

Table 3.4.11: Ambient Air Quality Profile of the Area

Parameter	Ozone (ppb)	SO ₂ (ppb)	NOx (ppb)	NO (ppb)	CO (ppm)	Dust ug/m ³	Humidity (%)	Wind speed (m/s)
Conc.	5.9	10.8	42.0	30	8	395.7	23-35	1.0-2.1

3.4.12 Effluent Disposal

As the site is still a vacant land, therefore, there is no generation of sanitary origin wastewater from the site per se. Similarly, there is also not any generation of industrial effluents or industrial discharges, since the plant has not been setup here, as yet. However, the proponent will construct a sanitary wastewater collection and disposal system for the management of the sanitary origin wastewater from the plant pursuant to its construction. Similarly, the proponent will also construct a wastewater treatment plant, for the treatment and disposal of the industrial effluents, discharges and the wastewaters to be generated from the plant, if any.

3.4.13 Background Radiological Characteristics

The background radiological characteristics of the site are nil. The X-ray machines, scanners and the radiotherapy equipment in use at the biomedical facilities at the major hospitals in the city, which is at least 5 km from the site, have some radioactive sources installed in them. However, the quantum of emission of radioactivity from these sources is negligible and does not contribute much towards background ambient radioactivity levels around. As such, there are no known radiological installations in the district, which may constitute to background radioactivity levels.

3.4.14 Ambient Noise Characteristics

The ambient noise levels at the site are insignificant. This is because of the uninhabited position of the area and open disposition of the site, which is a vacant land situated on a main road. As far as the nearby city of Layyah is concerned, the noise level vary from place to place and from time to time. Generally, the levels of the ambient and background noise are found higher during the peak hours and near the busy road junctions, in the vicinity of industrial establishments, commercial concerns and educational institutions. They are generally higher during morning and evening. In order to examine the noise potential of the site, the study team carried out a noise measurement survey, results of which are depicted in Table 3.4.14a. Similarly, Tables 3.4.14b & 3.4.14c present the hypothetical ambient noise characteristics and their impacts on human health and behaviour.

Table 3.4.14a: Noise Record at the Site

Date	Time	Noise (dB)
19.05.2023	23:00	50
19.05.2023	23:30	50
20.05.2023	00:00	50
20.05.2023	00:30	45
20.05.2023	01:00	45
20.05.2023	01:30	40
20.05.2023	02:00	35
20.05.2023	02:30	35
20.05.2023	03:00	40
20.05.2023	03:30	35
20.05.2023	04:00	40
20.05.2023	04:30	40
20.05.2023	05:00	45
20.05.2023	05:30	50
20.05.2023	06:00	50
20.05.2023	06:30	55
20.05.2023	07:00	60
20.05.2023	07:30	60
20.05.2023	08:00	65
20.05.2023	08:30	65

Date	Time	Noise (dB)
20.05.2023	12:00	85
20.05.2023	12:30	85
20.05.2023	13:00	85
20.05.2023	13:30	90
20.05.2023	14:00	90
20.05.2023	14:30	90
20.05.2023	15:00	90
20.05.2023	15:30	85
20.05.2023	16:00	90
20.05.2023	16:30	85
20.05.2023	17:00	90
20.05.2023	17:30	90
20.05.2023	18:00	85
20.05.2023	18:30	85
20.05.2023	19:00	90
20.05.2023	19:30	95
20.05.2023	20:00	95
20.05.2023	20:30	85
20.05.2023	21:00	85
20.05.2023	21:30	80

²¹ 2-Cities Investigation of Air and Water Quality (Gujranwala and Faisalabad), JICA/Pak-EPA, 2003
²² Air Quality Monitoring in Six Districts of Punjab using Physico-Chemical Techniques, EPD, GoPb, 2005

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3. Baseline Environmental & Socioeconomic Profile

09:00	70	20.05.2023	22:00	75
09:30	65	20.05.2023	22:30	65
10:00	70	20.05.2023	23:00	60
10:30	70	20.05.2023	23:30	55
11:00	65	21.05.2023	00:00	50
11:30	65	21.05.2023	00:30	45

Table 3.4.14b: Expected Noise Level at Different Project Locations

Location	Noise Level (dB)
Active machinery construction zone	85-90
Offsite areas	70-75
Loading & unloading areas	80-90
Offices & Support Facilities	50-70
Parking Area	40-50
Residential Area of the Project	60-75

Table 3.4.14c: Noise Annoyance Levels for Resident Communities

Day-night average sound level (dB)	Hearing Loss	Average Community Reaction (Likely)	Significance
75 and above	May begin to occur	Very severe	Noise is likely to one of the important adverse aspects of the community environment
70	Will not likely to occur	Severe	-do-
65	Will not occur	Significant	-do-
60	Will not occur	Moderate to slight	-do-
55 and below	Will not occur	Un-noticed	-do-

3.5 Ecological and Biological Environment

The ecological and biological environment of an area is likely to be affected by large-scale developmental schemes. The disturbances and imbalances in the ecological and or biological environment can adversely affect the biodiversity features of an area. The biodiversity of an area generally reflects the abundance and richness of the biological and or the ecological resources. The subsections hereunder contain discussion of the important impacts of setting-up and operation of the plant on the eco-biological environment as well as on the biodiversity characteristics of the area.

The site per se is devoid of any specific or major plantation except a few ordinary trees, the number of which is less than five, presently. There are no horticulture, and or, wildlife parks and planned gardens at or around the site. The linear plantations along the roads, railway line, and water channels constitute another floral resource of the district²³. It may be mentioned as a passing reference that owing to consistent human interventions over the centuries, the existing natural habitat of the area is largely a modified form of the original habitat of tropical thorn forests. Construction of an extensive irrigation network during early 20th century paved the way for transformation of the Tropical Thorn Forests into agricultural lands. This has led to a changed landscape and loss of wildlife. The predominant habitat of the district is the Tropical Thorn Forest.

3.5.1 Local Flora and Fauna

There is no specific flora and fauna indigenous either to the site or within the assumed radius of influence of the site. Similarly, there are no special indigenous or migratory species of aviary or wildlife particular to the site area. The biodiversity features are insignificant. Some common forms of weed, bush, and self-grown plants are found in the open agricultural lands of the area around²⁴. The major forest plantations in Layyah are in the form of linear plantations along the canal banks, roads, crop field boundaries, and in recreational and botanical parks. There are no large-scale manmade forest plantations in the district. The predominant species of the plants include shisham (*dalbergia sissoo*), eucalyptus, silver oak, and kikar (*acacia nilotica*). In addition, there are varieties of self-grown grass species standing along the surface water bodies.

It may be mentioned as a passing reference that owing to consistent human interventions over centuries, the existing natural habitat of the area is largely a modified form of the original habitat of tropical thorn forests. Construction of an extensive irrigation network during early 20th century paved the way for transformation of

²³ Based on Punjab Forest Department, Punjab Forestry Research Institute, Faisalabad, 2022

²⁴ Punjab Sustainable Development Strategy, EPD, Final Report, 2008

²⁵ Setting up of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]", Chak 285/TDA, Distt. Layyah

Project Registration, 2023.



the Tropical Thorn Forests into agricultural lands. This has led to a changed landscape and loss of wildlife. The predominant habitat of district is Tropical Thorn Forest²⁵. A list of some common flora and fauna along with biological names found in the area/district are given at Tables 3.5.1a & 3.5.1b.

Table 3.5.1a: Some Common Flora of the Area along with Botanical Names

Sr.	Common / Local Name	Botanical Name
1.	Jand	Prosopis spicigera
2.	Van	Salvadora obeoides
3.	Peelu	Salvadora Percica
4.	Keekar	Acacia Nilotica
5.	Shisham	Dalbergia
6.	Baqain	Azadrachta indica
7.	Shreen	Albizia Lebeck
8.	Popular	Populus deltoids
9.	Sufeda	Eucalyptus canaldulensis
10.	Pippal	Phycus Religiosa

Table 3.5.1b: Some Common Fauna of the Area along with Zoological Names

Sr.	Common / Local Name	Zoological Name
1.	Geedarh	Cannis aurius
2.	Sayyarh (Khargosh)	Lepus capensis
3.	Percupine (Seh)	Hysterix Indica
4.	Black partridge (Teetar)	Electoris melanocephala
5.	Eagle (Cheel)	Mitrus migrans
6.	Vultures (Giddh)	Gyps futros
7.	Bulbul	Pycnonodus xynthopygos
8.	Pigeon (Kabootar)	Treron waalia
9.	Dove (Fakhta)	Streptopilia roseogrisera
10.	Ducks (Batakh)	Anas spp



Fig 3.5.2a: Ecological Map of Punjab



Fig 3.5.2b: Wildlife Map of Punjab

3.5.2 Protected and Ecologically Sensitive Areas

There are not any notified ecologically protected areas within the zone of environmental influence of the site. As can be seen from the ecological and wildlife maps inserted here as Fig 3.5.2a & 3.5.2b, there are any sites of neither of ecological importance nor of wildlife in and around the site and the district.

3.6 Socio-Cultural Environment

This section presents baseline profile of the socioeconomic and sociocultural features of the area.

²⁵ Punjab Sustainable Development Strategy, EPD, Final Report, 2008
EIA: Setting-up of "Maryam Fatima Enterprises (Fat Melting & Protein Recovery Unit", Chak 285/TDA, Distt. Layyah

Green Revolution, 2023

3.6.1 Demographic Profile

The existing status of population count of the mauza could not be found due to non-availability of the existing data. Therefore, the demographic profile of the district has been used as an alternative for obtaining the baseline conditions pertaining to this aspect.

The population of the district, which was 1121 thousand in the 1998 Census, is now crossing over 1566 thousands²⁶. The average rate of population growth of the district is 3.21 percent per annum²⁷. With the existing growth rate, the population is expected to double by 2025. The urban population is 114,000 (12.8%) and the rural population is 977,000 (87.2%). Overall sex ratio is 107 males per 100 females²⁸. Layyah has considerably expanded during the recent years. The sign of expansion are visible around the cities, where agricultural lands interpose with new constructions, inhabitations, and farmhouses²⁹. Some useful demographic data of the district has been given in Table 3.6.1.

Table 3.6.1: Demographic Profile of the District

Tehsil	Area (km ²)	1951	1961	1972	1981	1998	2023 (Pro)
Chaubara	2755	17	36	65	94	161	
Karor	1824	50	92	174	226	369	
Layyah	1712	95	145	256	346	591	
Total	6291	162	273	495	666	1121	1566

Source: Punjab Development Statistics, Bureau of Statistics, GoPb, 2022)

(Thousands)

3.6.2 Land Use/Agricultural Profile

As the site is a vacant, uncultivated land situated on a main road in predominantly industrial settings, the land use profile of the site, per se, is insignificant and irrelevant with respect to the wider area around. The area outside the boundary wall of the site is mostly agricultural land. It may be mentioned as a passing reference that barring the residential areas of the major urban settlements, the open lands in Layyah are predominantly under agricultural usage. Agriculture is the most common occupation of the majority population in district Layyah. The crops grown include cotton, sugarcane, wheat, rice, maize, millets, potatoes, fodder, and some indigenous fruits like mango and citrus.

Owing to various factors, the project area has developed tremendously during the recent past. Resultantly, there has been a marked shift in the land use in the district from agricultural to residential, commercial and industrial categories and from open lands into built-up structures. This change is continuing with an enhanced pace, particularly in the peripheral rim around big towns. Whereas, land use profile in the major towns is predominantly that of permanent and the fixed structures, it is of mixed type in the suburbs and along the outer rim of the main towns, where agricultural lands still interpose with new fixed developments, constructions and inhabitations.

Despite some industrialization, agriculture is still the predominant economic activity of the district. Layyah is famous for sugarcane. Resultantly, there are number of sugar mills in the region. Sericulture, horticulture, and aviculture are also gaining popularity as the emerging economic activities. Investments in honeybee- sheep, goat, fish, poultry, and dairy farming are also increasing, as the opportunities exist in these sectors. The major seasonal crops include wheat, rice, maize, and vegetables. Other agricultural products include fodder, fresh vegetables, and lattice³⁰.

The reported area of Layyah is 628,000 hectares, out of which 473,000 hectares is cultivated land and the remaining is uncultivated³¹. The combined cropped area both for rabi and kharif crops is 596,000 hectares. Area under forest cover, however, is only 1,000 hectares. Area not available for cultivation, i.e., partly occupied by fixed structures, buildings, roads, etc is 155,000 hectares.

The principal modes of irrigation in the district are the surface channels supplemented by tubewells. Rainfall accounts only for a small proportion of the irrigation supplies. The land use pattern, agricultural profile and production of main vegetables of the district is given in Tables 3.6.2a & 3.6.2b.

²⁶ Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

²⁷ Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

²⁸ Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

²⁹ Punjab Sustainable Development Strategy, EPD, Final Report, 2008

³⁰ Punjab Sustainable Development Strategy, EPD, Final Report, 2008

³¹ Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

Esar, Setting-up of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit", Chak 285/TDA, Distt. Layyah Green Revolution, 2023

Table 3.6.2a: Land Use/Agricultural Profile of the District

Reported Area	Cultivated Area	Uncultivated Area	Cropped Area
628	473	155	505

(Source: Punjab Development Statistics, Bureau of Statistics, GoPb, 2022)

Table 3.6.2b: Production of Main Vegetables

Vegetable	Production (m. tons)		
	2018-19	2019-20	2021-22
Potatoes	75699	67304	62733
Carrot	11533	11589	15676
Cauliflower	5786	6047	6352
Turnip	3166	3376	3434
Ladyfinger	2867	2985	3396
Onion	2874	2318	1792
Tomato	974	784	694

(Source: Punjab Development Statistics, Bureau of Statistics, GoPb, 2022)

3.6.3 Industrial Profile

There is no big industry worth the name in the project area, except Layyah Sugar Mills. According to the status of the industry, conducted by the Directorate of Industries, Government of Punjab, there are no industrial units operating in the district. The district, being one of the politically important districts of the province has a mixed economy of industrial sector, agriculture sector, services sector, commercial sector, and the expatriates' income. The pace of industrialization in the district has remained impressive since the creation of Pakistan. There are a number of small to medium industrial estates, where numbers of small to large industrial units exist. The Layyah Chamber of Commerce & Industry is the main hub of industrial economic activities in the district. The district has over 500 small to large industrial and cottage units absorbing an average daily labour force of 49,000 persons³². A glimpse of the industrial profile of the district is given in Tables 3.6.3a & 3.6.3b.

Table 3.6.3a: Census Statistics of Manufacturing Industry

District	Census Year	No. of Factories	Avg. Daily Employment	Gross value of industrial production
Layyah	2021-22	6	1	3016 M

(Source: Punjab Development Statistics, Bureau of Statistics, GoPb, 2022)

Table 3.6.3b: Number of Registered Factories & Employment Status

District	Factories & Employment		
	<100	>100	Total
District Layyah	130	2	132

(Source: Punjab Development Statistics, Bureau of Statistics, GoPb, 2022)

3.6.4 Healthcare Facilities Profile

There is no major healthcare facility in the designated zone of environmental influence of the project area. The public sector health facilities of the district include one District Headquarter Hospital (DHQH), three Tehsil Headquarter Hospitals (THQH), and number of Rural Health Centres (RHCs) and Basic Health Units (BHUs) seen while travelling along the major roads. The major healthcare setup nearest to the facility site is the DH Layyah, which is located in the city of Layyah. The hospital is providing all types of diagnostics, therapeutic and preventive healthcare services including major surgeries. The hospital provides healthcare facilities to surrounding population and even to the patients from other parts of the districts.

The number of healthcare facilities, their service level, and the area-coverage is reasonable and satisfactory. There is fair number of general and specialized healthcare facilities for providing round-the-clock medical services. The DHQ hospital has Nursing School for training of nurses and some offer different paramedical laboratory technician courses as well. The hospital also offers internship facilities for the fresh medical graduates. There are number of private healthcare facilities of comparable standard and quality. The number of private clinics has grown in the recent past. The public sector healthcare facilities include large hospitals.

³² Punjab Industrial Directory, Directorate of Industries, GoPb, 2022

E&A: Setting up of "Maryam Fatima Enterprises (Fat Melting & Protein Recovery Unit", Chak 285/TDA, Distt. Layyah Green Revolution, 2023

These are providing primary to secondary level outdoor and indoor health services for the affording patients. However, there is no medical teaching hospital in the district. Tables 3.6.4a & 3.6.4b depict respectively a gist of the healthcare profile of the district and a list of some common diseases prevalent in the area³⁴.

Table 3.6.4a: Healthcare Profile of the District

Table 3.6.4a: Healthcare Profile of the District										
Dispensaries			RHCs		BHUs		TB Clinics		SHC	MCH
Hospitals	No	Bed	No	Bed	No	Bed	No	Bed		
	400	5	2	40	16	32	0	0	7	1
Source: Development Statistics, Bureau of Statistics, GoPb, 2022)										
(Thousand hectares)										

Source: Punjab Development Statistics, Bureau of Statistics, GoPb, 2022)

(Thousand hectares)

Table 3.6.4b: Some Common Diseases of the Area (Source: Health Dev Statistics Pb, 2022)

Sr.	Disease	Sr.	Disease
1.	Influenza (endemic)	11.	Typhoid fever
2.	Whooping cough	12.	Leprosy
3.	Measles	13.	Conjunctivitis
4.	Infantile diarrhoea	14.	Dermatitis
5.	Amoebic dysentery	15.	Glaucoma
6.	Bacillary dysentery	16.	Pneumonia
7.	Infectious hepatitis	17.	Mumps
8.	Viral hepatitis	18.	Arthritis
9.	Tuberculosis	19.	Allergic rhinitis
10.	Malaria	20.	Nutritional deficiency

3.6.5 Education Facilities Profile

There are two main streams of education setup in the area:

- Formal school education according to the Government syllabi
- Informal madrassah education in madrassah attached with masjids or run by religious organizations

The educational facilities in the district range from primary level Masjid-Maktab³⁵ schools to Degree Colleges and highly specialized research institutions or centres of excellence. There are number of Government Primary Schools in the villages and towns in the area around. However, there is no public sector university in Layyah. There is good number of technical and vocational training institutions and fair number of special education institutions in the district run by the Technical Education and Vocational Training Authority (TEVTA) and the Department of Special Education, respectively³⁶. There are number of privately owned schools, academies and tuition centres. The literacy rate of the district, as per 1998 Census, is 38.7%. The male literacy rate is 53.0% and the female 23.4%. The literacy rate in the urban population is 62.5% and in the rural folk 34.9%³⁷.

While travelling in the area, one comes across number of privately owned schools and tuition academies, but outside the zone of environmental influence of the site. The geographical spread of the public sector or the government schools in the district is fair. Colleges for both boys and girls are also present at approachable. The primary level education facilities are being upgraded under the Punjab Education Sector Reforms Programme³⁸. As regards the site, there is not any educational institution in the immediate vicinity of the site. Tables 3.6.5a & 3.6.5b present respectively the educational facilities profile and literacy rate of the district.

Table 3.6.5a: Educational Profile of the District

Masjid Schools	Primary Schools	Middle Schools	High Schools	Colleges
19	1244	241	143+14	16+2+11+3

Source: Punjab Development Statistics, Bureau of Statistics, GoPb, 2022)

Table 3.6.5b: Literacy Ratio in the District

Literacy Ratio	Urban Literacy	Rural Literacy	Male Literacy	Female Literacy
51.90%	64.20%	42.50%	60.90%	42.20%

³⁴ A Brief Introduction to Punjab Health Sector Reforms Program, PMIU, 2022

³⁵ Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

³⁶ Mosque is called "Masjid" in Urdu Language. Maktab is Urdu equivalent of school

³⁷ Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

³⁸ Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

³⁹ Info by School Education Deptt. GoPb, 2022

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3.6.6 Livestock and Farming

The agriculturally fertile lands are a big asset of the country. However, because of its fast engulfment by the housing and other non-agrarian sectors, availability of lands for agricultural pursuits has squeezed over the time. The site being a predominantly rural locality, is devoid of livestock and or farming. However, livestock, goat, and sheep farming have been traditionally an attractive profession of the farming communities of the district. In a way, livestock is complimentary and dependent to agricultural farming. However, because of its fast engulfment of the fertile agricultural lands by the housing and other non-agrarian sectors, availability of lands for agricultural pursuits has squeezed over the time. Nevertheless, agriculture and livestock farming are still the major sources of income for the peri-urban and the rural communities of the district. A number of small to medium size dairy and cattle farms can be seen in the villages in the wider area around. These dairy farms provide fresh milk for the residents of the nearby cities. Because of number of factors, livestock, goat, and sheep farming are becoming attractive sectors of investments. In a way, livestock is complimentary and dependent on the agricultural farming. Usage of the husbandry for ploughing and for farming purposes is on the decline and is being replaced rapidly by mechanical implements of farming. Government and commercial financial institutions are granting liberal loans to the farmers and the growers for purchasing agricultural machinery³⁹. Table 3.6.6 presents some statistical data about the livestock resources of the area/district.

Table 3.6.6: Livestock Resources of the District

Cattle	Buffaloes	Sheep	Goats	Work Animals
327,000	213,000	275,000	373,000	36,000

(Source: Punjab Development Statistics, Bureau of Statistics, GoPb, 2022)

3.6.7 Infrastructures Profile

The site, owing to its siting on a main road, has almost all the basic public infrastructure. The construction and development of the missing infrastructure by the Government is in progress. The electricity poles have been installed and the sewerage drainage network is being laid. It need no reiteration that provision of all essential infrastructure as required for hassle free setting-up and running of the industry here is the primary responsibility of Government. The Chowk Azam road, on which the site is situated, offers an excellent driving quality⁴⁰. It may be noted that construction of roads and provision of related infrastructures in rural areas of the district are being upgraded under various development and upgradation packages.

As a part of its developmental agenda, the Government is focussing attention on the construction of farm-to-market roads (FMR) in the district and building of other infrastructures through the "Khushal Pakistan Programme" under the Public Sector Development Programme (PSDP). Construction of the roads under various programmes has substantially improved agricultural marketing and timely transportation of the produce from farm to markets.

Being the district headquarter, the city of Layyah is a major transport hub and is well connected to other parts of the country through roads and railway network. Many of the trains moving between Karachi and Peshawar halt at Layyah. The road transport is available for almost all the major cities of Pakistan. The nearest airport is DG Khan Airport, about 25 Kilometres away from the site. Table 3.6.7 presents the road network and infrastructure profile of the district.

Table 3.6.7: Infrastructure Profile (Length of Roads in km) of the District

National Highways	Motorway	Provincial Highways	R&B Sector	FMR	Sugarcane Cess Road	Ex-Dist. Council Roads	Total Length
00	00	452.85	25.76	982.83	28.63	68.30	1558.37

(Source: Punjab Development Statistics, Bureau of Statistics, GoPb, 2022)

3.6.8 Socioeconomic Profile

The site being a vacant land, uncultivated and unused land, is devoid of any socioeconomic profile of any site. The majority of the residents of the nearby villages rely upon animal husbandry for sustenance and income and tend to rear cows, sheep, goats for milk and meat. Small-scale cottage and the agro-based industry are on the rise. Many of the locals travel to find work in bigger urban centres and metropolises like Faisalabad, Islamabad, Lahore, and Karachi.

³⁹ Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

⁴⁰ Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

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The people of the rural areas depend largely on livestock for their livelihood and usually keep buffaloes, cows, sheep, goats and poultry. Cash income of the people is small. As far as employment is concerned, abundant opportunities of business, trade and industry exist. A large section of population is absorbed in services sector, mostly in the civil government. A few are working abroad as expatriates. Large sections of population are engaged in agricultural sector i.e., farming and livestock raising. The mean income level of the people is around Rs. 2000-3000 per month. Opportunities of income enhancement exist in the business, trade, industry and agriculture in the district.

Communication facilities in the form of regular landlines and mobile telephony are available in the entire district. Telecommunication system in the form of regular landline, broadband wireless telephony, and mobile telephone connections is one of the growing areas. Internet facility through dialup and broadband DSL is available. The majority of the educational institutions in the public and private sector have computers for aiding in teaching and making the students computer literate.

The main occupations of the population are farming, shop keeping, service (government & public), working abroad and working as labourer. According to the statistics relating to income of the main occupational classes, per capita per day income ranges from Rs. 21 to Rs. 77 for the main occupational groups. The per capita income appears to be related to the officially announced poverty line of Rs. 878.64/capita/month (Pakistan Economic Survey, 2022) that comes to Rs. 29.28 per capita per day. The latest estimate of inflation-adjusted poverty line per capita per day comes to Rs. 34.82 in 2019, up from Rs 29.28 in 2017-18. The analysis reveals that except for households, whose members are in Govt. or private service, or whose family members have gone abroad, the other occupation classes in the area are living below the official poverty line.

3.6.9 Culture, Religion, Customs, Traditions and Specialties

The site being a vacant land, is devoid of any historical culture, customs, tradition, religious practices and the specialties. The people of the area predominantly are Muslims. Punjabi, with variant dialects, is the native language and is spoken widely in the district. However, Urdu is gaining popularity and is becoming the lingua franca, particularly amongst the youngsters and the educated youth. People generally respect "chadar" (women headgear symbolic of women respect) and chardewari (privacy), i.e. they do not mingle up with women publicly and stay away from others houses and respectfully wait to be called in or the residents to come out from their houses. A reasonable proportion of womenfolk observe the purdah (veil) etiquette, i.e., they remain secluded from outsiders. However, womenfolk do participate in almost all sort of social, cultural, economic, educational, and service activities⁴¹. Although Joint family system is the predominant mode of social life, yet "nucleus" or small family system is also found because of socio economic compulsions and attitudinal shifts in the youth.

The culture of the district is a mix of three different traditions Punjabi, Colonial and Immigrants. The people are generally religious and conservative. The two main languages spoken in the region are Punjabi and Urdu. However, considerable number of people speaking Saralki and Pushto are also settled in the district. By and large, the residents are co-operative and willing to live peacefully. The linguistic and caste based ties and preferences appear to be reasonably strong. Everyday commodities as well as items of luxury are freely available in the district.

Although Joint family system is seen in number of households in the surrounding areas, yet the nucleus or small family system is fast emerging as the preferred mode of living, particularly in the urban areas, because of socio economic compulsions and attitudinal shifts in the youth.

3.6.10 Historical & Archaeological Sites

As can be seen from the information provided in Table 3.6.10, there is no historical site within the zone of environmental influence of the site. There is not any antiquity protected under the Federal legislation i.e., the Antiquities Act 1976 or the Punjab Special Premises Ordinance 1985⁴².

Table 3.6.10: Historical and Archaeological Sites in the District

Federally Protected	Provincially Protected
Nil	Nil

⁴¹ Based on information obtained during professional team's visit to the site
⁴² Punjab Development Statistics, Bureau of Statistics, GoPb, 2022

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3.7 Lab Reports of Environmental Analyses

Base Line Laboratory reports of the environmental analyses are attached. The environmental profile of the site is similar to that of the wider area around. Therefore, any lab reports of environmental parameters are annexed with file.

3.8 Suitability of the Site

The site, being a vacant land, owned and possessed by the proponent, situated on Chak No.285/TDA, District Layyah, is suitable for the setting-up of the plant here. The plant will be constructed only with grant of its environmental approval from the EPA-Pb.



Fig. 3.4.1a: Map showing Location of Layyah

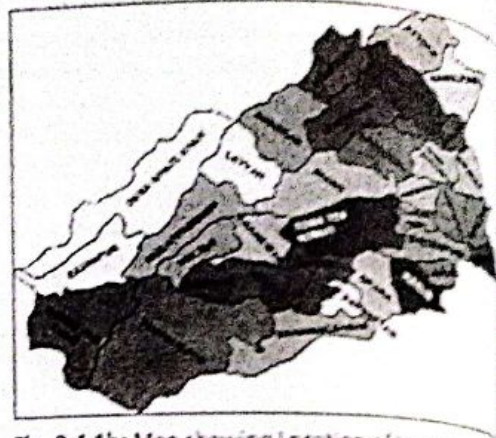


Fig. 3.4.1b: Map showing Location of Layyah



Fig. 3.5.1a: Wildlife Map of Punjab



Fig. 3.5.1b: Ecological Map of Punjab

4 SCREENING OF POTENTIAL ENVIRONMENTAL IMPACTS & MITIGATIONS



4. SCREENING OF ENVIRONMENTAL IMPACTS & MITIGATIONS

4.1 Environmental Impacts & Mitigations

The instant section describes the aspects of environmental examination of construction and installation of the machinery and its operation on the physical, biological, social aspects of the environment. The report presents an outline of the measures for mitigation of the identified impacts. Both the primary and secondary as well as the direct and the indirect impacts have been discussed with respect to their immediate and the ultimate impacts on the various environmental quality parameters and the social significance.

Unlike the large-scale developmental projects, the instant project, because of its extremely small size, scale and spread, is likely not to produce any significant or even insignificant impacts on the local physical, biological and social environment within or out the project's zone of environmental influence. The setting-up of the plant on a vacant land, owned and possessed by the proponent will involve construction of building, installation of machinery and allied/ancillary infrastructure.

A qualified architectural engineer has prepared the design and architectural features of the plant's building. The design has been prepared in such a manner, as it will not cause any disturbances to the environment. Only some limited scale activities relating to construction of the plant building (such as civil-, mechanical-, and electrical-works etc.) will be carried out alongwith installation of necessary machinery and equipment. Therefore, interaction of construction activities with the environmental parameters and their possible impacts on the baseline environmental profile (positive & negative; visible & invisible; concrete & absolute; and reversible & irreversible) have been examined thoroughly.

The sections and subsections, following hereinafter, present a discussion and analysis of the various foreseeable environmental and social impacts of the project, if any (although none is expected) during both phases of the project i.e., the Construction phase and the subsequent operation phase. Besides presenting analysis of the likely impacts, the discussion presents an outline of the mitigation strategy and the best-subsequent mitigation measures for avoiding and addressing the identified adverse impacts, if any. The report presents discussion and analysis of the various primary and the secondary impacts as well as the direct and the indirect impacts of the project with respect to their immediate and the ultimate or distant effects on the various environmental quality parameters and the social factors of significance, wherever relevant.

The environmental impacts of operation of the plant are likely to arise mainly from combustion of various kinds of waste materials including biomedical waste during the operation phase. It is assumed that some vehicles running on fossil fuel (like petrol, diesel) will be deployed during construction of the plant building and installation of machinery and equipment on the site. The end-of-pipe exhaust emissions from engines of these vehicles and generation of noise during their deployment might produce some limited scale and momentary impacts on the local environment. Additionally, generation and disposal of the unspent building material debris, solid wastes and packaging wastes may also be associated with some other insignificant and transitory impacts of construction. Therefore, the impacts of construction, if any, will be temporary and transitory nature. They will abate after construction of the plant building, complete in all respects.

As against the negative impacts, there will be number of positive impacts of setting-up of the plant. There would be availability of jobs for both skilled and unskilled personnel, income prospects for the persons involved in carriage and transport of materials and goods for the project and above all round the year availability of the products to be produced at the plant with a view to avoid their shortage in the market.

The premier most positive benefit of the plant is equitable availability of the products produced here, even in the distant and the remote areas of the province, at comparative prices. Because of these benefits, it sufficed here to state that the positive impacts of setting-up of the plant will far outweigh the potential negative impacts, if any, particularly, when most of the latter are insignificant and mitigable. As regards the operation phase, not any significant environmental impacts could be discerned except the probability of industrial accidents from non-observance of the precautionary and the standard operating procedures by workers and carelessness on their part.

4.2 Assessment Methodology

The Impact EIA Report is based on the standard impact assessment methodology as prescribed by Government of Pakistan. In accordance with the said methodology, comparative analysis, both of the negative and the positive impacts has been carried out with respect to the already existing baseline conditions. The said comparison follows a parametric and a non-parametric scheme i.e., how and to what extent various environmental quality parameters (e.g., those relating to soil, air, water, and aesthetics) and non-parametric aspects (economy, social value system, employment, lifestyles, and behavioural patterns) will be influenced by various activities within the plant's zone of environmental influence.

The Modified Impact Assessment Matrices (Tables 4.2a & 4.2b) and a specific questionnaire (Table 4.2c) have been used for identification, screening and characterization of the unmitigated as well as the residual impacts on the physical, biological and social aspects using a numerical scale from (-)2 to 0 to (+)2 respectively. The value (-) 2 denotes high adverse impacts, (-) 1 low adverse impacts, 0 insignificant impacts, (+) 2 high beneficial impacts, (+) 1 low beneficial impacts, and N denotes nil impacts. This method of scaling up of the magnitude of the impacts helps in easy appreciation of the nature, quantum and effect of the project's impacts. Table 4.2d presents the method for environmental screening of the site.

4.3 Mitigation Strategy

The mitigation measures, as presented in this document, are aimed to prevent and reduce the foreseeable impacts of the plant activities during both Construction and the subsequent operation phase. The mitigation strategy for countering the adverse impacts is built on the following hierarchy of choices:

- Avoiding a particular impact altogether by taking or not taking a certain action or activity
- Minimizing the impact by limiting the degree or magnitude of the action and its implementation
- Rectifying the impacts by repairing, rehabilitating or restoring the affected environment
- Reducing or eliminating the impacts over the time by preserving and maintaining the operations all during life of the action
- Compensating for the impacts by replacing or providing substitute resources or environments
- Installing pollution control equipment and devices wherever indicated and necessary
- Improving landscape of the site to augment aesthetics and to reduce visual intrusion
- Reducing transmission of unwanted noise from site or spots of noise generating activities
- Taking any other appropriate step on the basis of feedback information on plant's usage and operation

It is advisable that these measures are implemented in a sequential order, beginning with avoiding the impacts and thereafter adopting the next sequential choices according to the ease of their implementation and cost considerations. Adoption of the above outlined mitigation strategy is expected to ensure long-term environmental and social sustainability of the project.

4.4 Likely Impacts and Mitigations of Location, Design & Planning

The discussion following hereinafter relates to impacts of construction of the plant building and installation of machinery and equipment on various important environmental parameters.

4.4.1 Design, Location & Layout Planning

The subsections following hereinafter present a discussion on environmental impacts of the project's design and planning stage. As per the information provided by the proponent, the site is a vacant and virgin land and the plant will be constructed as an altogether new structure. The proponent will hire professional services of an architect and engineer, who will prepare architectural design and layout plan of the building perfectly in accordance with the laid down criteria, guidelines and specifications of the concerned regulatory agency. As regards construction of the building and installation of plant machinery, the proponent will carry it out by a hired-on-contract labour force and a petty contractor. Therefore, both the proponent and the petty contractor will be responsible for the aspects relating to construction and operation of the plant. The scope of construction work of the building will include preparation of detailed design criteria, design analysis, calculations, detailed architectural drawings and quality control procedures necessary for setting-up of the plant and installation of machinery together with O&M costs. The contractor will also carry out the additional site investigations, if any will be required, for developing and drafting a time schedule suitable to meet construction requirements by adhering to the same.



i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measures (EMP)
1.	Selection of site	▪ Neighbourhood issues ▪ Land use change ▪ Disposal of wastes and effluents ▪ Availability of amenities and utilities	Start of concept planning	Construction phase	Start of concept planning	▪ Minor ▪ Localized ▪ Insignificant ▪ Unimportant ▪ Mitigable	Not beyond the assumed zone of enviro influence	▪ Neighbours ▪ Residents ▪ Workers ▪ Management ▪ Others in contact	Carry out a study of regarding the for the including an of disposal of and effluents likely late changes

4.5 Likely Impacts and Mitigations of Construction Phase

The discussion following hereinafter relates to impacts of the Construction phase of the project on various important environmental parameters.

4.5.1 Parametric Impacts of Construction Phase

The subsections following hereinafter present a discussion on the various parametric impacts of the project's construction phase.

4.5.1.1 Soils and lands

There will not be any environmental impacts on the soils and lands from construction of plant's building and installation of machinery on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah.

i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measures (EMP)
1.	Project setting up activities	▪ Neighbourhood issues ▪ Access obstruction from haphazard placement of materials ▪ Unnecessary diggings and excavations ▪ disposal of dugout material and construction waste	From start till completion of construction	Construction phase	Some of the effects are likely to occur with probability	▪ Minor ▪ Localized ▪ Insignificant ▪ Unimportant ▪ Mitigable	Not beyond the assumed zone of enviro influence	▪ Neighbours ▪ Residents ▪ Workers ▪ Management ▪ Others in contact	▪ Ensure implementation of the EMP recommended mitigation measures forwarding likely impacts ▪ Cover material protective and shield the exterior ▪ Ensure implementation

Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
	- excessive usage of water - disposal of used water - worksite accidents and injuries - neighbourhood noise - billowing of dust particulates							worksite safety measures and usage of PPEs

4.5.1.2 Surface Water Quality

As mentioned earlier under Chapter 2, there are not any significant surface water channels, even in the zone of environmental influence of the site. There is not any river or freshwater canal near the site. Therefore, there will not be any interaction of the surface water channels with the site.

i) Likely Impacts
• Nil

ii) Activities Likely to Produce the Impacts
• Nil

iii) Mitigation Measures
• Nil

Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
Project setting up activities	Degradation of local surface water resources, channels and waterways	NA	Construction phase	Nil. Site is not in interaction with any surface water body	• Nil	NA	• NA	• NA

4.5.1.3 Groundwater Abstraction and Quality

Generally, construction activities, per se, do not cause groundwater depletion or contamination. The groundwater quality is affected only if wastewater (from any source) somehow succeeds in reaching to the groundwater aquifer. The most plausible route is a groundwater borehole. As there is no borehole at the site, therefore, there is no probability of contamination of groundwater from this route. The requirement of water for civil work and masonry structures will be just normal @ 1 m³ for 10 m² of constructed / covered area. As the total covered area of the plant will be 16,249 ft² (1,510 m²), the total water requirement will be 151 m³. This will be arranged easily either from a local water supply vendor or from the borehole, which is to be constructed to cater for water needs for plant's operation.

i) Likely Impacts
• Nil

ii) Activities Likely to Produce the Impacts
• Nil

iii) Mitigation Measures
• Nil

Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
Project setting up activities	Degradation of local	From start till	Construction	Improbable	• Minor • Localized	Not beyond	• Vicinity community	• Ensure quality construction of



Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measures (EM)
	up activities	groundwater resources and or aquifer ▪ Depletion of groundwater resources from over usage	completion of construction	phase		▪ Insignificant ▪ Unimportant ▪ Mitigable	the assumed zone of environmental influence		groundwater borehole, if be constructed ▪ Ensure implementation of the water conservation practices, suggested in ▪ Ensure implementation of the recommended ▪ Check the quality period

4.5.1.4 Wastewaters and Effluents

The construction of the plant building and installation of machinery and equipment therein will not generate any wastewaters, whatsoever

i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measures (EM)
1.	Project setting up activities	▪ Degradation of local wastewater drainage from indiscriminate throwing of construction wastewater	From start till completion of construction	Construction phase	Improbable	▪ Minor ▪ Localized ▪ Insignificant ▪ Unimportant ▪ Mitigable	Not beyond the assumed zone of environmental influence	▪ Nil	▪ Ensure through construction wastewater after sept treatment at a valid NOC regulatory (proponent already obtained requisite from the regulatory authority) ▪ Ensure implementation of the recommended ▪ Check the wastewater periodically

4.5.1.5 Air Quality

The construction of the plant building and installation of machinery and equipment therein will not produce any air quality impacts, whatsoever

i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
Project setting up activities	- Degradation of local air quality from construction activities - Billowing of dust and particulates from the loose materials stored at the site	From start till completion of construction	Construction phase	Improbable	- Minor - Localized - Insignificant - Unimportant - Mitigable	Not beyond the assumed zone of enviro influence	- Neighbours - Residents - Workers - Management - Others in contact	- Cover all loose materials with protective sheets - Do not carry out construction activities during windy conditions - Shield off the site from the exterior with a curtain shield - Ensure implementation of the EMP recommendations - Check the air quality periodically

4.5.1.6 Noise and Vibrations

Generally, the noise and vibrations are of relevance to construction activities only if their levels exceed the prescribed limits. The noise levels higher than a threshold can produce psychological and social impacts of distracted attention, irritation and short-temperedness. However, owing to non-cumulative property of sound and vibrations, the impacts are reversible and of significance only during continuation of the noisy activities.

i) Likely Impacts

• Nil

ii) Activities Likely to Produce the Impacts

• Nil

iii) Mitigation Measures

• Nil

Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
Project setting up activities	Generation of noise and vibrations from construction activities	From start till completion of construction	Construction phase	Only during construction hours	- Minor - Localized - Insignificant - Unimportant - Mitigable	Not beyond the assumed zone of enviro influence	- Neighbours - Residents - Workers - Management - Others in contact	- Carry out the constructions during daylight hours - Provide PPEs to the exposed persons - Ensure implementation of the EMP recommendations

4.5.2 Non-Parametric Impacts of the Construction Phase

The subsections following hereinafter present a discussion on the non-parametric impacts of the plant's Construction phase.

4.5.2.1 Land use change

The land use change from a more useful purpose to a less useful purpose is considered generally a kind of negative environmental impact. As regards construction of plant's building and installation of machinery, there will not be any change in the land use, as the site is a vacant open land. As regards the permissible land use under the applicable bylaws, the proponent shall obtain an NOC in this regard from the concerned regulatory authority regarding use of the land for setting-up the plant.

**I) Likely Impacts**

- Nil

II) Activities Likely to Produce the Impacts

- Nil

III) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation (EIA)
1.	Project setting up activities	▪ Negative land use change	Concept planning	Construction phase	Once only	▪ Minor ▪ Localized ▪ Insignificant ▪ Unimportant ▪ Mitigable	Not beyond the assumed zone of enviro influence	▪ Owner of land	▪ Ensure change of valid approval concerned regulatory (proponent already in the LDA regard) ▪ Ensure implement the recommended

4.5.2.2 Solid Wastes

The construction of the plant building and installation of machinery and equipment therein will not generate any solid wastes.

I) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation (EIA)
1.	Project setting up activities	▪ Likelihood of degradation of soil, land, air, water and ambient environment from improper disposal of wastes ▪ Likelihood of spread of diseases from growth of disease-causing organisms in the waste	From start till completion of construction	Construction phase	Indeterminate Unsure	▪ Minor ▪ Localized ▪ Insignificant ▪ Unimportant ▪ Mitigable	Not beyond the assumed zone of enviro influence	▪ Nil	▪ Ensure secure collection disposal of ▪ Provide collection appropriate locations ▪ Display information signboards educate the not to throw wastes ▪ Ensure implement the recommended

4.5.2.3 Access, Easement, Health, Wellbeing and Worksite Safety

The construction of the civil structures will not cause any environmental and social impacts of rights of access, easement, health, community's wellbeing and worksite safety. Improper and poor design can lead to construction of poor-quality structures, which in turn can produce psychological, behavioural and health

impacts on the users of the facility. A poorly designed structure can be troublesome for the users and the neighbouring communities. Haphazardly placed materials and debris on or near the site can cause impedance of movement, risks of personal injury and inconvenience for the neighbours. Non-observance of the worksite safety instructions and non-use of safety gadgets during Construction operations can increase vulnerability of the exposed persons to adverse health and personal safety impacts.

i) Likely Impacts

• Nil

ii) Activities Likely to Produce the Impacts

• Nil

iii) Mitigation Measures

• Nil

Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
Project setting up activities	•Likelihood of inconvenience to locals •Risks of injuries and hazard exposure of the workers and other persons	From start till completion of construction	Construction phase	Rare and Infrequent	•Minor •Localized •Insignificant •Unimportant •Mitigable	Not beyond the assumed zone of enviro influence	•Neighbours •Residents •Workers •Management •Others in contact	•Ensure that no inconvenience is caused to the neighbours •Ensure wearing of PPEs by all the persons while on work •Ensure implementation of the EMP recommendations

4.5.2.4 Cutting and Removal Trees and Crops

The construction of the plant building and installation of machinery and equipment therein will not involve cutting and removal of any trees, whatsoever

i) Likely Impacts

• Nil

ii) Activities Likely to Produce the Impacts

• Nil

iii) Mitigation Measures

• Nil

Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
Project setting up activities	•Likelihood of loss of vegetative cover •Land instability due to removal of trees •Effect on the habitat and local fauna and flora	From start till completion of construction	Construction phase	Unlikely	•Minor •Localized •Insignificant •Unimportant •Mitigable	Not beyond the assumed zone of enviro influence	•Nil	•Avoid cutting of any standing tree •If cutting of a tree is inevitable, ensure plantation of double the number of trees cut •Ensure implementation of the EMP recommendations

4.6 Likely Environmental Impacts of Operation Phase

The discussion following hereinafter relates to some foreseeable impacts of the plant's operation phase on various important environmental parameters as well as of the non-parametric aspects. As a general rule, the potentiality of the negative impacts of a plant is likely to increase with the number of persons using the facility.



Higher the number of users, higher will be the amount of the wastes, effluents and air emissions generated. Thus, volumetric increases of consumption of resources and the resultant generation of effluents and emissions will be proportional directly to the number of the users.

4.6.1 Parametric Impacts of the Operation (Usage) Phase

The subsections following hereinafter present a discussion on the parametric impacts of the plant's operation phase.

4.6.1.1 Soils and Lands

The irresponsible and indiscriminate discharge of wastewaters and solid wastes (e.g., bottom ash, partially burnt and or unburnt materials) on nearby soils can have the potential to contaminate the receiving soils. However, in the instant case, the proponent will irrigate his own nearby fields with surplus water from the steam making and recirculation system provided sufficient amount of such water becomes available for the purpose. The returning steam, after condensation will be reused and recirculated into the system. The water loss from evaporation will be replenished by adding freshwater to the system. In this manner, used water from the plant will not have any impacts on the nearby and adjacent soils and lands.

i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation (E)
1.	Project operational activities	▪ Nil	Nil	Operation phase	NA	▪ NA	Not beyond the assumed zone of environmental influence	▪ NA	▪ Ensure implement the recommended

4.6.1.2 Surface Water Quality

The operation of the plant will not have any interaction with any nearby surface waters. There is no natural surface water body near or within the zone of environmental influence of the site. There are few irrigation watercourses in the vicinity for supplying water to the nearby agricultural lands. As a matter of fact, none of the surface water sources of the area is likely to be affected from any of the operational activities of the plant. Furthermore, the local geographical gradient also does not suggest any likelihood of effects on the surface waters from gravity drainage from the site. Therefore, no chances of pollution of the local surface water during operation.

i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation (E)
1.	Project operational	▪ Degradation of local surface water	NA	Operation phase	Nil. Site is not in interaction	▪ Nil	NA	▪ NA	▪ NA

Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
resources, channels and waterways				with any surface water body				

4.6.1.3 Groundwater Abstraction and Quality

Water will be required, during operation of the plant, for various usages, which interalia will include the following:

- ✓ Normal human water needs for the workers, staff, employees, visitors and management both at the worksite toilets and the pantry
- ✓ Water requirement for steam making, steam condensation and other like uses
- ✓ Water requirement for the pollution control system
- ✓ Miscellaneous and unclassified water requirements e.g., washing of floor, machinery etc.

As regards water usage for human needs, it will be just normal for such like plant and can be calculated on per capita basis. Generally, the water usage in a small sized industrial unit, like the instant one is around 50-70 litres per person per day. This is normal amount and does not have any bearing on the local water resources. As regards water requirement for the process operations, it is difficult to calculate the exact amount at this stage. However, large amount of water will be required in the initial start-up, as the water tank will have to be filled to ensure continuous and uninterrupted water supply for process operations. The approx. capacity of the water tank will be 1,000 ft³ or 30 m³. After the initial filling, the tank will supply water for the above-mentioned operational needs. The water loss from evaporation, leakages and seepage is calculated @ 10%. Hence, 100 ft³ or 3 m³ will have to be replenished daily from the groundwater turbine to be installed at the plant.

i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
Project operation activities	▪ Degradation of local groundwater resources and or aquifer ▪ Depletion of groundwater resources from over usage	Operation phase	Operation phase	Indeterminate Indiscernible	▪ Minor ▪ Localized ▪ Insignificant ▪ Unimportant ▪ Mitigable	Not beyond the assumed zone of environmental influence	▪ Vicinity community	▪ Ensure implementation of the water use conservation practices, as suggested in EMP ▪ Ensure implementation of the EMP recommendations ▪ Check the water quality periodically

4.6.1.4 Wastewaters and Effluents

Because of observance of water reuse, recirculation and conservation systems, there will not be any wastewater discharge to the exterior except the release of some surplus water from the steam making system. All returning water from the processing machinery will end-up at the water collection tank. After treatment and cooling down, water will be recirculated to the system for reuse. In this way, optimal water conservation will be ensured.

i) Likely Impacts

- Nil



ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measures
1.	Project operational activities	▪ Degradation of local wastewater drainage from indiscriminate throwing of used wastewater ▪ Discharge of sanitation wastewater from toilets and washrooms without treatment	Operation phase	Operation phase	Operation phase	▪ Minor ▪ Localized ▪ Insignificant ▪ Unimportant ▪ Mitigable	Not beyond the assumed zone of environmental influence	▪ Workers ▪ Management ▪ Others in contact	▪ Ensure that process is prior to its into drainage under a regulatory agency has already the required from the regulatory ▪ Ensure that sanitation wastewater septic tank its discharges receiving channel ▪ Ensure implement the recommended ▪ Check the wastewater periodically

4.6.1.5 Air Quality

There will not be any air emissions or discharge of flue gases from the system, except the exhaust from the boiler stack. The composition of the boiler exhaust will depend mainly on the type, nature and composition of the fuel to be used therein. The boiler exhaust may comprise of particulate matter, soot and the flue gas. The boiler will be fitted with an efficient air emission cleaning and control system in the form of a stack tower of appropriate size and height. This arrangement will ensure compliance of the final vent from the boiler to conform with the PEQS. The proponent will ensure proper working, repair and maintenance of the system.

i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measures
1.	Project operational activities	▪ Degradation of local air quality from operational activities ▪ Likelihood of effect on local	Operation phase	Operation phase	Linked to particular activity	▪ Minor ▪ Localized ▪ Insignificant ▪ Unimportant ▪ Mitigable	Not beyond the assumed zone of environmental influence	▪ Neighbours ▪ Residents ▪ Workers ▪ Management ▪ Others in contact	▪ Install pollution equipment likely to emission ▪ Ensure working

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Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
air quality from stack emissions •blowing of drag dust from movement of vehicles coming and leaving the plant premises							- control system • Check the stack emission periodically to ensure their conformity with the applicable PEQS • Ensure implementation of the EMP recommendations • Check the air quality periodically

4.6.2 Non-Parametric Impacts of the Operation Phase

The subsections following hereinafter present a discussion on the non-parametric impacts of the plant's operation phase.

4.6.2.1 Electricity Usage

The plant machinery will run mainly on the electricity connection from the concerned electric power distribution company. The plant will have its own dedicated electric transformer on payment from LESCO.

(i) Likely Impacts

- Nil

(ii) Activities Likely to Produce the Impacts

- Nil

(iii) Mitigation Measures

- Nil

Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
• Nil	Operation phase	Operation phase	Unknown	• unknown • Mitigable	Backend impacts	• NA	• Ensure as minimal usage of electric power, as possible • Ensure implementation of the EMP recommendations

4.6.2.2 Water Usage

The routine operations of the plant, per se, will not require any alarming amounts of freshwater. However, freshwater will be required for the various ordinary human, sanitation and other miscellaneous needs of the project staff. As has been mentioned under Section 1, the strength of the operational staff will hardly exceed 10 persons at any one time. If it is assumed that all 10 persons are always present and the average per capita consumption for all and various needs will be 50 litres per person per day, then the total volumetric requirement of freshwater for 10 persons will be 500 litres (0.5 m³) per day, the maximum. Based on these calculations, the monthly consumption will be 15000 (15 m³) litres and the annual consumption against the 280 days' work year will be 140000 (140 m³) litres. This is just normal and without any significance.

As regards water requirement for the process operations, it is difficult to calculate the exact amount at this stage. However, large amount of water will be required in the initial start-up, as the water tank will have to be filled to ensure continuous and uninterrupted water supply for process operations. The approx. capacity of the water tank will be 1,000 ft³ or 30 m³. After the initial filling, the tank will supply water for the above-mentioned operational needs. The water loss from evaporation, leakages and seepage is calculated @ 10%. Hence, 100 ft³ or 3 m³ will have to be replenished daily from the groundwater turbine to be installed at the plant.

As mentioned above, water will be used mainly for steam generation, steam cooling, odour removal and at the worksite toilets and pantries. The major usage will be for steam making and condensation of the returned steam. The spent water from the process hall will return to the cooling tank from where it will be recirculated and reused after lowering of its temperature. In this manner, usage of water will be minimised and conserved efficiently. The requirements of water in the worksite toilets and washrooms will be just normal for a such like facility. There is no population or human settlement adjacent to or near the site, which might be affected from water usage at the plant. Therefore, usage of water at the plant will not interfere with community's water resources.

i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measures
1.	Project operational activities	• Degradation of water quality • Depletion of water source from over usage	Operation phase	Operation phase	Probable	• Minor • Localized • Insignificant • Unimportant • Mitigable	Not beyond the assumed zone of enviro influence	• Vicinity community	• Ensure implementation of the water conservation practices suggested • Ensure implementation of the recommended measures • Check the quality periodically

4.6.2.3 Solid Wastes

There will not be excessive solid waste generation during operation of the plan except ordinary routine food waste. This ordinary household type waste will consist of food wraps, papers, eatables, food residues, paper, glass, empty cans, tin bottles, food packaging, peelings, PET bottles, plastics, toys and rags⁴⁴. According to a study on the subject, such types of the municipal wastes contain relatively higher amounts of inorganics on comparative weight basis⁴⁵. The organic constituents of these wastes tend to putrefy early and therefore may give rise to foul smells particularly during hot summer days⁴⁶. These solid wastes will be collected by the project authorities separately and will be transported to the municipal solid waste dumping site. As regard the process operations, there will not be the generation of any solid wastes.

i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measures
1.	Project operational	• Likelihood of degradation of soil, land, air,	Operation phase	Operation phase	Operation phase	• Minor • Localized • Insignificant	Not beyond the	• Neighbours • Residents • Workers	• Ensure secure disposal

⁴⁴ Management of Solid Waste, Solid Waste Management Unit, City District Government, Lahore, 2002
⁴⁵ Characterization of Solid Wastes in Lahore, MSc Thesis, College of Earth & Environmental Sciences, Lahore

⁴⁶ Solid Waste Guidelines, Environmental Protection Agency, GoPb, 2008
 EIA: Setting-up of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit", Chak 285/TDA, Distt. Layyah

Green Revolution, 2023

Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
water and ambient environment from improper disposal of wastes of spread of diseases from growth of disease-causing organisms in the waste				- Unimportant - Mitigable	assumed zone of enviro influence	- Management - Others in contact	- Provide waste collection bins at appropriate locations - Display instructional signboards to educate the people not to throw away wastes - Ensure implementation of the EMP recommendations

4.6.2.4 Noise, Vibrations and Odours

There will not be the generation of any undesirable noise and vibrations during operation phase of the plant.

i) Likely Impacts

• Nil

ii) Activities Likely to Produce the Impacts

• Nil

iii) Mitigation Measures

• Nil

Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
Generation of noise and vibrations from construction activities	Operation phase	Operation phase	Operation phase	- Minor - Localized - Insignificant - Unimportant - Mitigable	Not beyond the assumed zone of enviro influence	- Neighbours - Residents - Workers - Management - Others in contact	- Ensure proper upkeep and oiling of the noise making machinery regularly - Provide noise barriers around the high noise producing areas - Provide PPEs to the exposed persons - Ensure implementation of the EMP recommendations

4.6.2.5 Health, Safety and Community Wellbeing

There will not be any impacts relating to health, safety and community wellbeing

i) Likely Impacts

• Nil

ii) Activities Likely to Produce the Impacts

• Nil

iii) Mitigation Measures

• Nil

Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
Likelihood of inconvenience	Operation phase	Operation phase	Infrequent	- Minor - Localized	Plant machine	- Workers - Management	Ensure that no inconvenience is

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Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation
	nal activities	to locals • Risks of injuries and hazard exposure of the workers and other persons				• Insignificant • Unimportant • Mitigable	ry area	• Others contact	• Ensure PPEs to persons work • Provide system premises • Ensure implement the recommen

4.6.2.6 Receiving of Waste Materials

The plant building will have a separate designate enclosure for receiving and storing the incoming waste materials under optimal conditions. The enclosure will be a well-ventilated, airy and well-lit place to ensure favourable conditions for storage of the materials without affecting their quality and characteristics. The incoming materials will be properly unloaded under the supervision of the shift in charge and stacked at their respective places according to nature and type of the material. There will not be any discernible impacts of the activity of unloading and storing of the waste materials at the premises.

i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation
1.	Project operational activities	• Unsafe receiving and storage of wastes • Generation of foul smells from long storage of degradable organic waste • Risks of infection, injuries and hazard exposure of the workers and other persons handling the wastes	Operation phase	Operation phase	Infrequent	• Minor • Localized • Insignificant • Unimportant • Mitigable	Waste receiving and storage area	• Workers • Management • Others in contact	• Ensure incoming received handled according SOPs • Avoid personnel with material • Ensure PPEs to persons handling • Provide system premises • Ensure implement the recommen

4.6.2.7 Process Operations

The cooking or digestion of the raw poultry wastes will take place under strict monitoring in the standard cookers/digesters at normal atmospheric pressure and a temperature of around 180°C. The steam heating of the contents inside the cookers will convert the wastes into protein meal. It will be ensured that the operations are carried out with the help of suitable machinery and the manual interference is avoided to the

maximum extent possible. Nevertheless, everyone present and working at the plant will observe and comply with the standard regime of Industrial safety. The workers performing duty inside the production hall will put on requisite safety and personal protection gadgets, while present in the work area and operating the plant. Owing to adoption of the SOPs, there will not be any discernible impacts of plant's operation provided the recommended mitigation measures are properly implemented and efficient working of the pollution control system is ensured.

i) Likely Impacts

- Industrial accidents
- Escape of flue gas in the atmosphere
- Generation of bottom ash
- Workers' exposure to industrial hazards and process operations

ii) Activities Likely to Produce the Impacts

- Process and production operations
- Faulty working of the pollution control system
- Non observance of the SOPs

iii) Mitigation Measures

- Ensure observance of the SOPs for production operations
- Ensure proper working of the pollution control system
- Timely remove the faults, as and when they may occur
- Ensure strict monitoring of the process operations, pollution control system and all others

Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measure (EMP)
Project operational activities	- Generation of particulate and air emissions from waste cooking operations with all likely impacts - Risks of infection, injuries and hazard exposure of the workers and other persons operating the plant	Operation phase	Operation phase	Infrequent	- Minor - Localized - Insignificant - Unimportant - Mitigable	Not beyond the assumed zone of environmental influence	- Neighbours - Residents - Workers - Management - Others in contact	- Ensure that all plant operations are carried out in accordance with the standard SOPs - Ensure regular check-up and upkeep of all the machinery and equipment - Ensure proper working of the emission control equipment and system - Ensure wearing of PPEs by all the persons while handling the waste - Provide first aid system at the premises - Carry out lab analysis of the air emissions periodically to ensure their conformity with the applicable PEQS - Ensure implementation of the EMP recommendations

4.6.2.8 Marketing

There will not any finished products to be manufactured or produced at the plant. However, the proponent will institute a marketing system for fetching business for his investment. In addition to direct receipt of the



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wastes from industrial, commercial and institutional sources, the proponent will make endeavours to use biomedical and healthcare waste from the hospitals, clinics, dispensaries and alike sources etc. There will not be any discernible impacts of marketing efforts by the proponent.

i) Likely Impacts

- Nil

ii) Activities Likely to Produce the Impacts

- Nil

iii) Mitigation Measures

- Nil

Sr.	Activity	Likely Impacts	Time of Occurrence	Duration of Impact	Frequency Probability Occurrence	Category of Impact	Zone of Effect	Exposed Persons	Mitigation Measures (EIA)
1.	Project operational activities	▪ Nil	Operation phase	Operation phase	NA	▪ Nil	NA	▪ Nil	▪ Ensure implementation of the recommended measures

4.7 Environmental Enhancement Measures

Aggressive tree plantation, development of grassy plots, lawns and greenbelts is proposed as the prime measure for enhancing and improving the environmental ambience and aesthetics of the plant premises

Simplified Environmental and Social Impact Matrix (Unmitigated Impact)

Environmental Components		Physical						Biological		Social and Socioeconomic														
Project Activities	Soil Erosion / Contamination	Surface Water Quality	Groundwater Quality	Air Quality	Natural Vegetation	Wildlife	Access and Easement	Noise and Vibrations	Agriculture / Farming	Livestock Grazing	Safety and Hazards	Public Infrastructure	Aesthetic Value	Wetlands Eco-system	Health and Wellbeing	Education / Learning	Gender Issues	Employment / Income	Community Empowerment	Price of Land	Community Participation	Archaeological Heritage	Cultural Issues	Impact on occupants
Site Selection	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	+1	+1	+1	0	N	N	N
Master Planning / Layout Designing	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	+1	N	+1	0	N	N	N
Construction Activities	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	N	+2	+1	+1	+1	N	N	N
Operation	N	N	N	N	N	N	N	N	N	N	N	N	N	N	+2	+2	+1	+2	+1	+1	+1	N	0	N

Key: -2=High Negative Impact -1=Low Negative Impact 0=insignificant/Negligible impact +1=Low Positive Impact +2=High Positive Impact N=No Impact



Table 4.2c

Environmental Questionnaire

A: Environment / Resource Linkages:

Aspect	Action
Will environmental considerations, including present human land use pattern in the vicinity, be incorporated into the selection of technology, the location, scale & design of the plant?	Not relevant
Have hydrologic, geologic, seismological, and meteorological studies have been made to anticipate and minimize possible damage to humans, fish & wildlife resources and vegetation?	Pertinent aspects have been studied
Does a comprehensive plan link the project to environmental aspects of raw materials, bye-product utilization, shipping, and processing?	yes

B: Project Design & Construction:

Have alternative sites or locations of the plant been considered in an effort to avoid or mitigate environmental degradation?	yes
What features for environmental protection will be incorporated in the design & operations?	As given in technical feasibility and EIA
Is there a comprehensive construction plan that takes into account ecological factors?	Yes
Are road patterns, land excavation, fill sites, refuse disposal activities etc., planned to minimize damage to the natural environment?	Yes
What provisions have been made for restoring sections of the construction area	Not relevant
Will construction personnel be exposed to unique local health problem, or will they introduce diseases?	No

C: Operations:

Do offloading & on-loading methods incorporate human & environmental safeguards?	Yes
What are the dangers of an explosion or spill of hazardous material	negligible
Will contingency plans, including manpower & materials, be available to cope with the accidents?	Yes
Has adequate attention been given to the design & construction of safe storage facilities for hazardous materials & refinery products?	Yes. But not relevant
Will floating roof tanks be employed?	No
What types and quantities of effluents or particulate emissions will the plant produce?	No

(Adapted from the EIA Guidelines, Govt. of Pakistan)

Sr.	Screening Parameter	Likelihood		Remarks
		Yes	No	
	A. Plant Siting: Is the site adjacent to or within any of the notified environmentally sensitive areas, protected antiquity, wildlife sanctuary, reserve range, wetland, mangrove, estuarine, buffer zone of protected area and or special area for protecting biodiversity?		No	NA
	B. Potential Environmental Impacts Will construction of the plant cause:			
	a) Loss of precious ecological values (e.g. result of encroachment into forests/swamplands or historical/cultural buildings/areas, disruption of hydrology of natural waterways, regional flooding, and drainage hazards)?		No	NA
	b) impairment of downstream water quality and therefore, impairment of downstream beneficial uses of water?		No	NA
	c) dislocation or involuntary resettlement of people?		No	NA
	d) disproportionate impacts on the poor, women and children, indigenous people or other vulnerable groups?		No	NA
	e) Potential social conflicts arising from land tenure and land use issues?		No	NA
	f) Soil erosion?		No	NA
	g) Noise from construction activities		No	NA
	h) Billowing of dust during construction?		No	NA
	i) Water logging and soil salinization due to inadequate drainage and water ponding?		No	NA
	j) Leaching of soil nutrients and changes in soil characteristics due to excessive application of irrigation water?		No	NA
	k) Reduction of downstream water supply during peak seasons?		No	NA
	l) Soil pollution, polluted farm runoff and groundwater, and public health risks due to excessive application of fertilizers and pesticides?		No	NA
	m) Soil erosion (furrow, surface)?		No	NA
	n) Spilling of watercourses, water channels or water bodies?		No	NA
	o) introduction or increase in incidence of waterborne or water related diseases?		No	NA
	p) dangers to a safe and healthy working environment due to physical, chemical and biological hazards during project construction and operation?		No	NA



4. Environmental Examination & Mitigations

	q) Large population influx. During construction and operation that causes increased burden on social parameters?		No	NA
	r) Infrastructure and services (such as water supply and sanitation systems)?		No	NA
	s) Social conflicts if workers from other regions or places are hired?		No	NA
	t) Risks to community health and safety due to the transport, storage, and use and/or disposal of materials such as explosives, fuel and other chemicals during construction and operation?		No	NA
	u) Community safety risks due to both accidental and natural hazards, especially where the structural elements or components of the project (e.g., irrigation dams) are accessible to members of the affected community or where their failure could result in injury to the decommissioning?		No	NA

5

ENVIRONMENTAL MANAGEMENT & MONITORING PLAN



5. ENVIRONMENTAL MANAGEMENT & MONITORING PROGRAMME

5.1 Objectives of ESMP

The ESMP aims to provide the implementation mechanism for the mitigation and control measures for the potential impacts of the project on environment and people. The specific objectives of the ESMP include the following:

- To provide a mechanism to implement the mitigation and control measures identified during the IEE/EIA.
- To propose institutional arrangements to implement the above-mentioned mitigation and control measures.
- To define environmental monitoring requirements to ensure effective implementation of the mitigation and control measures.
- To identify capacity building needs with respect to the environmental and social aspects of the project.
- To specify the documentation requirements with respect to the ESMP implementation.

5.2 Institutional Capacity for ESMP

This section describes the environmental, social and risk management plan (ESRMP) for ensuring smooth environmental and social management of the project at all stages of activities and dealing with an emergency as and when it may occur. The objective of including the ESRMP into this EIA report is to ensure prevention of any situation of emergency and in case of development of such a situation, the steps required to be taken to manage the situation. The section also contains a set of environmental guidelines for avoiding and preventing the adverse environmental impacts of the project. Besides, institutional setup for implementing the ESRMP, management of hazards and emergencies, importance of the compliance-monitoring programme was also been discussed.

The ESRMP is considered as the core area of an environmental examination. It focuses on environmental protection through minimization of the impending risks and the likelihood of occurrence of hazards. The ESRMP aims to ensure that adverse consequences of an emergency are addressed appropriately at all stages of disaster management from prevention to rehabilitation and resettlement of the affected individuals. The ESRMP also provides a mechanism to reduce likelihood of occurrence of the risks to an acceptable level by adopting the risk prevention strategies. Wherever possible and applicable, the ESRMP provides for avoiding environmental risks and, in case they are unavoidable, then identification of the most direct and the best possible measures for reducing the extent of damage to persons and property. Additionally, ESRMP designates the special risk areas and proposes stringent measures for hazard avoidance at these high risk and sensitive areas. In nutshell, the objectives of the proposed ESRMP would be as under:

- To provide an early warning system for the potential or actual risks
- To provide a systematic and implementable mechanism for risk characterization and risk mitigation
- To test effectiveness of the risk handling mechanism and hence improve upon the weaker areas
- To ensure that operational activities are carried out in sound and secure manner by avoiding the probability of risks occurrence

Safety measures, including appropriate design solutions, onsite handling of the hazardous materials during Construction and resolution of social conflicts during operational phase of the project represent major components of the ESRMP. The ESRMP also aims to ensure that the quality of the life values as well cultural and religious sensitivities are fully preserved all through various stages of the project to avoid social severance and conflicts. Lastly, the ESRMP has been framed in line with the national legislative framework, environmental standards and regulations to ensure environmental compatibility of the project.

The proponent shall setup an Environmental Safety and Health (ESH) Unit for timely appreciation, identification, and reporting of the environmental issues relating to the plant activities and for taking necessary preventive and corrective measures for addressing the issues at various levels of responsibilities. The ESH will be permanent setup and will exist during the operation phase as well but with a little change in composition and mandate. During the operation phase, the ESH may consist of the persons appointed in consultation with the EPA and other relevant agencies. Expenses of the ESHU may be met with from regular budget of the project. The ESHU would be an Independent functional unit headed by an ESH Officer, who will

be assisted by an appropriate number of subordinate officers, technical personnel, and others. The ESHU should be equipped with all essential equipment for dealing with any situation of emergency and disaster.

5.3 Training Schedule

The prime objective of the trainings and capacity building programmes will be to ensure long-term environmental sustenance of the plant's operations and activities and to keep the ESH Manager and the project management abreast of the emerging issues, troubleshooting strategies, and modern techniques of environmental management and handling emergencies. The efficacy of trainings will be tested from quickness of the response to a crisis as exhibited by the preparedness exercises.

It is recommended to hold at least one training or practice drill session into environmental issues every six months all during the operational life of the plant. The selected personnel and the employees posted on key points may attend these training sessions. These training sessions should focus on issues of practical nature likely to come up during the plant's operations. They should also focus on sensitizing the participants about environmental stakes of the project and its various process operations. The training programmes must cater for managing the on-ground environmental problems and the strategies for implementing the suggested environmental mitigation measures. A comprehensive training session or a training workshop of appropriate duration be held annually with a much wider participation from the project management down to the plant workers. These workshops may focus on the policy issues, sustainable development strategies, and the troubleshooting mechanisms on the basis of the experiences of the preceding years. An external environmental consultancy of eminence and repute will be involved in making these training sessions and workshops meaningful.

5.4 Summary of Impacts & Mitigations

The plant will be one of the many such like units already operational in various parts of the country. The setting-up of the plant will help to ensure safe and secure recovery of protein meal from the poultry waste. The demand of safe, secure and environment friendly disposal of animal wastes is rising with every passing day, particularly in the cities. Therefore, construction of the facilities for efficient disposal of the wastes is imperative. The setting-up of the plants for recovery of materials from the wastes, as compared to their landfilling, is the preferred choice for the disposal of the poultry and other animal waste, which is generated in thousands of tonnes daily in the country. The construction of the plant will help to fulfil this public demand efficiently and effectively.

As mentioned earlier in the Executive Summary, there will not be any potentially negative environmental impacts of either construction or operation of the plant. Hence, no mitigation measures are warranted. As regards, cleanliness of the premises, implementation of the good housekeeping practices will be sufficient to ensure good janitorial profile and hygiene of the premises. Although not any specific mitigation measures are required or recommended, yet implementation of the ordinary environment enhancement measures and compliance of the environmental laws of the country will ensure desirable environmental performance of the plant. Likewise, implementation of the management guidelines, as given in the relevant chapters of the EIAR, is expected to upscale the environmental profile of the plant.

The operation phase, like the construction phase too, is devoid of any impacts. Therefore, not any specific mitigation measures have been proposed. This environmental performance of the project shall be reviewed regularly for early detection of any environmental negativity of the plant's operational activities once it has gone into full operation. In addition to the above, a stringent monitoring regime has been proposed to monitor environmental performance of the project all during its operational life with a view to take up timely corrective and ameliorative measures and address them, if warranted.

In view of the increasing demand of safe disposal of wastes in the country, it is an urgent need of the time to take up establishment of such like projects in order to meet the market demand on the one hand and to provide opportunities of job, employment and economic prospects for the people of the country on the other hand. Nevertheless, this emergent necessity of setting up such like units should not undermine reverence of the environment. It is imperative that likely impacts of such projects on the environment should be well evaluated and addressed in their planning, construction and operation. It needs to be ensured that setting up of such like projects does not affect the environment adversely by bringing about unfavourable land use changes, large-scale exploitation of natural resources, and irreversible pollution of the air, water and soil environments from emissions, effluents, solid wastes and other contaminants, if any might originate from such projects. It is therefore necessary that these projects are subjected to compulsory environmental examination



Last but not the least, implementation of the mitigation measures should not be taken as substitute of research and development (R&D) which is the keystone to find advanced measures and technologies for addressing environmental issues and concerns. R&D must be recognized as one of the appropriate tools to find solutions for the diverse environmental issues that may crop up during lifespan of a project. It is, therefore, recommended that the proponent may review operations of the project continuously to make them compatible with the applicable environmental quality standards. This will help to improve environmental profile of the project and will improve its socio-environmental outlook as well. Tables 5.4a and 5.4b present activity- and parameter-based mitigation measures.

5.5 Equipment Maintenance

All the machinery and equipment, installed at the plant, is kept clean, tidy, tuned-up and up-to-date, as per the instructions and the operating manuals of their respective manufacturers. The ESH Unit will inspect and verify the monitoring checklists of the upkeep and maintenance, as per their respective schedule. Fig. 5.5 depicts location placement of emergency handling equipment at the premises.

Locations									Others
1 CX area	✓	✓	✓	✓	---	✓	✓	---	---
Batteries Bunker	✓	✓	✓	✓	In case of handling Soda And Acid	✓	✓	In case of handling Soda And Acid	
breaker	✓	✓	✓	✓		✓	✓		---
Sulphate process	✓	✓	✓	✓		✓	✓		---
2 Inside factory gate	✓	✓			---	---	---	---	---

Fig. 5.5: Location placement of emergency handling equipment at the premises

5.6 Environmental Budget

Funds will be required for efficient performance of the ESH Unit. Apart from expenses on maintenance, payment of utilities, salaries of the staff, external compliance monitoring by an environmental firm will also require allocation of money. It is, therefore, recommended that the project should have suitable environmental budget.

Table 5.6: Tentative Environmental Budget

Sr.	Particulars	Cost (Rs.)
1.	Cost of land	
2.	Land rent (per annum)	
3.	Cost of machinery and equipment	
4.	Plant and building repair and maintenance cost (per annum)	
5.	Environmental enhancement (per annum)	
6.	Salaries, wages and alike (per annum)	
7.	Debt, credit, miscellaneous and contingency	
	Total	

A). Design and Planning Phase

Sr.	Activity	Potential Env. Impact	Likelihood of Occurrence		Frequency, Duration and Span	Suggested Mitigation Measures	Responsibility	Monitoring Requirement	Remarks
			Likely	Unlikely					
1.	Project planning	Improper and imperfect planning may cause wastage of time, energy and resources	Yes	Yes	Nil	Hire a team of experts for doing proper planning and spadework	Proponent	Nil	A well thought over and proper planning of the project is an essential prerequisite for its success and implementation
2.	Site selection	Selection of an unsuitable site may lead to number of social, economic, transportation and environmental issues	Yes	Yes	Nil	Select a site which is suitable for setting-up the project and where majority of civil amenities are available and easily accessible from a major road	Proponent	Nil	Selection of a suitable site is crucial for success and operational life of the project. The site selection should be done keeping in view the various factors such as nearness to a major road, availability of civic amenities (water, electricity, telephone, gas etc.) and proximity to a wastewater drainage channel. The site should be away from human settlements and be preferably in an industrial locality
3.	Architectural design and layout plan	Poor architectural design and layout plan may lead to construction of a faulty, congested and unserviceable structure	Yes	Yes	Nil	Hire the services of a professional and competent architect for preparing layout plan and architectural design	Proponent	Nil	The layout plan and architectural design of the project should be prepared by a professional and competent architect, preferably a team of architect, structure engineer, civil engineer and other
4.	Government approvals	Non obtaining of requisite Government approvals may create number of issues and problems	Yes	Yes	Nil	Ensure obtaining of all requisite approvals prior to implementing the project	Proponent	Nil	The proponent should ensure obtaining of all requisite Government approvals in respect of the project before embarking on its construction



B). Construction and Setting-Up Phase

Sr.	Activity	Potential Env. Impact	Likelihood of Occurrence		Frequency, Duration and Span	Suggested Mitigation Measures	Responsibility	Monitoring Requirement	Remarks
			Likely	Unlikely					
1.	Preliminary and preparatory site visits and inspections	Billowing of drag dust from wheels of the visiting vehicles	Yes		During vehicle movement	- Reduce speed while approaching the site - Apply brakes slowly and gradually - Wait for dust to settle before opening vehicle door - Sprinkle the track before leaving the site - Display signboard instructions at site	- Driver(s) - Visiting person(s) - Proponent	NA	Billowing of drag dust from kacha tracks and even from asphalt roads from fast moving vehicles is a routine observation. However, it can be prevented by implementing the suggested mitigation measures and guidelines
2.	Onsite establishment of labour camp	- Littering of soil and land from irresponsible throwing of food residue waste, open attending of call of nature - Health inflictions from suage of unsafe drinking water	Yes		All during construction span	- Ensure provision of safe drinking water from nearest water source - Provide receptacles for collection of wastes - Ensure proper and safe disposal of wastes - Provide makeshift type sanitary toilets for needs of the camp workers - Carry out regular medical check-up of the workers - Educate the workers in health, sanitation and hygiene	- Proponent - Construction contractor - Campsite workers	NA	A labour camp is established in routine for a medium to large size construction. It is always the responsibility of the proponent to ensure maintenance and management of the labour camp including care of health and hygiene of the resident labour

S.	Onsite receipt, offloading, stacking and storage of building construction materials etc.	All incoming materials should be stored at designated places preferably away from pedestrian pathways - All the materials should be securely stacked so as to avoid spoiling of the ground underneath - The stored materials should be protected against rainfall to avoid lixiviation - Injuries to material handlers during receipt, offloading, transportation and shifting be avoided by complying with preventive precautionary measures - The unspent materials should be collected and disposed of properly	Likely	Unlikely	All during construction on span	- Clearly demarcate and designate the enclosures for receipt and storage of each type of material separately - Display suitably worded preventive and precautionary instructions regarding handling of the materials - Provide and ensure that the workers put on PPEs while handling the materials and on work - Ensure proper collection of spent and unused remaining materials and their disposal - Don't allow passers-by to come near the stacked materials - Only the authorized persons should handle and have access to stacked materials - Maintain a proper inventory register for all types of materials - Prohibit smoking and washing etc.	- Proponent Ste in charge - Constructi on contractor - Masons - workers	On daily basis by the site in charge	All building and construction materials should be safely and securely received, stacked, stored and handled at the site. The proponent should make the site inaccurate responsible in this respect. A first aid box should always be readily present to cater for any accident, incident or injury. The emergency telephone numbers to be contacted first in case of some eventuality be well displayed at the campsite and other locations.
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Sr.	Activity	Potential Env. Impact	Likelihood of Occurrence		Frequency, Duration and Span	Suggested Mitigation Measures	Responsibility	Monitoring Requirement	Remarks
			Likely	Unlikely					
						near the stacked materials - Ensure provision of fire extinguishers near the materials that are likely to catch fire - Erect protective fencing, where required - Provide first aid kit			
4.	Diggings and excavations for laying the foundations	- Billowing of particulate dust from diggings, improper placement of the digged material and improper covering of the digged loose material - Likelihood of injuries to workers	Yes		Only during digging and excavation operations	- Ensure safe and secure diggings, as per the layout plan - Avoid unnecessary diggings and excavations - Stack the digged loose material at a designated place - Cover all digged loose material with impervious sheets to avoid contact with rainfall and exterior - Properly backfill the digged loose material - Properly dispose of the balance unspent excavated material - Provide and ensure that the workers put on PPEs while digging or backfilling - Provide first aid kit	- Proponent - Site in charge - Construction contractor - Masons - Workers	On daily basis by the site in charge	The diggings and excavations for laying the foundations is an important activity, as it generates lot of loose materials. If the digged loose material is improperly stored, it can pose number of environmental implications, hazards and risks. It is therefore imperative that all digged loose material is properly place, covered with impervious sheets to avoid contact with the exterior to prevent its billowing, spread and dispersal through wind and rainfall. The proponent should make the site in charge responsible in this respect. A first aid box should always be readily present to cater for any accident, incident or injury. After laying the foundations, the digged loose material should be properly backfilled. The unspent surplus material be reused where needed

Sr.	Activity	Potential Env. Impact	Likelihood of Occurrence		Frequency, Duration and Span	Suggested Mitigation Measures	Responsibility	Monitoring Requirement	Remarks
			Likely	Unlikely					
5.	Construction of building, civil structures and complementary structures	- Billowing of particulate dust from construction activities - Littering of ground from bits and pieces of unspent materials - Likelihood of soil contamination from loose laying of the construction materials - Likelihood of injuries to workers working onsite and on scaffoldings - Unscrupulous water use and unsafe disposal of spent water may cause soil contamination	Yes		All during building construction and other civil works	- Ensure safe handling of all building materials - Ensure safety and security of the scaffoldings and other temporary gadgets - Ensure construction progress under supervision of resident engineer and architect - Isolate the active construction area from exterior by using appropriate shielding material / sheets / curtain - Properly dispose of the surplus and unspent material - Provide and ensure that the workers put on PPEs while on work - Provide first aid kit at the site	- Proponent - Architect - Resident Engineer - Site in charge - Construction contractor - Masons - workers	On daily basis by the site in charge	Construction of the plant's building, civil structure and other components is an important activity from environmental standpoint. The proponent must ensure implementation of safety and precautionary measures as well as recommended mitigation guidelines to avoid and prevent any untoward impacts during this phase. Proper safety and security of all the persons engaged in construction, directly or indirectly, be ensured. Water use conservation be ensured by using water only for essential needs. The active construction zone be shielded off the exterior to avoid blowing of particulate dust through wind and rainfall. The proponent should make the site inaccurate responsible in this respect. A first aid box should always be readily present to cater for any accident, incident or injury. The unspent surplus material be reused where needed or disposed of properly.

C). Operation and Production Phase

Sr.	Activity	Potential Env. Impact	Likelihood of Occurrence		Frequency, Duration and Span	Suggested Mitigation Measures	Responsibility	Monitoring Requirement	Remarks
			Likely	Unlikely					
1.						-	-		



Table S.4b

ENVIRONMENTAL MANAGEMENT AND MONITORING PLAN / FRAMEWORK (PARAMETER BASED)

Sr.	Parameter/Aspect	Mitigation Measure	Remarks
1.	Land ownership	NA	The site / land should either be in the ownership and possession of the proponent or at least on long term lease with the proponent
2.	Land use change	- Ensure there is no negative land use change - The land use change is for a better and beneficial purpose - The land use change is permissible under the law and prior permission / NOC is obtained from the concerned regulatory authority / body - In case of occupied land, ensure proper resettlement, rehabilitation and welfare of the persons to be displaced - The right of way (RoW) of the neighbours is not affected, restricted or blocked in any way, whatsoever	Using a hitherto unused and uncultivated land for an industrial purpose, which will move the wheel of local economy and will generate opportunities of job, employment and business will be a better and superior land use purpose
3.	Downstream water availability	- Avoid damage, spoiling or blocking of any water line, watercourse or channel passing through or adjacent to the site - Don't throw any debris or waste in the water channel	The construction of the plant, in no way should obstruct the surface water of the adjacent lands
4.	Soil degradation and erosion	- Avoid throwing of wastes, debris and discard on the ground - Provide suitable receptacles at appropriate locations for collection and disposal of solid wastes - If an underground water reservoir is to be constructed, it should be properly lined with impermeable lining to avoid bottom and lateral seepage of water from it - Avoid discharging any wastewater, effluents, chemicals or liquids, as may affect or harm the soil crust	Indiscriminate and unscrupulous disposal of all types of wastes, liquids and wastewater can degrade and damage the surface layer of the soil. This should be avoided
5.	Water degradation and contamination	- Avoid throwing of wastes, debris and discards in the water body - Ensure proper lining of the water channels, where required and necessary - Provide temporary protective fencing around or along a water channel or a water body, wherever required - The drinking water source for the neighbourhood community should be especially protected - Avoid discharging any wastewater, effluents, chemicals or liquids, as may affect or harm to any water channel or water body	Water channels, water sources and water bodies are most susceptible targets of degradation and contamination from irresponsible throwing of wastes, chemicals, liquids and other items

		- Avoid cutting of trees for setting-up the plant - If any tree is to be cut, as being unavoidable, then ensure plantation of two new trees as compensatory tree plantation for each tree cut - Select a site that is sited away from a reserved sanctuary or ecologically sensitive area	
7.	Worksite safety, security and risk avoidance	- Avoid adventurism on the part of the workers employed for construction and other works - Strictly prohibit smoking at the site, particularly near the inflammable commodities - Ensure wearing of protective gears and PPEs by the workers on the job - Always keep a first aid kit ready and updated at the site - Ensure availability of appropriate fire extinguishers and key points - Ensure daily cleaning of worksite toilets, floors and pantry	The proponent must ensure worksite safety, hygiene and wellbeing of the workers and others
8.	Damage to cultural heritage	- Ensure that the site is away from any antiquities - The construction and other activities at the site do not interact or affect or bear upon the nearby graveyard, shrine or a place of religious reverence, in any manner, whatsoever	The proponent must show implementation of the Antiquities Act 1976 and the rules and regulations made under it
9.	Opportunities of job, placement, employment and business	- The locals of the neighbourhood community should be preferred for unskilled job, provided they are otherwise fit for the job - Subject to social norms, womenfolk should also be provided the opportunities of job and employment - Ensure that no child labour is hired or employed at the plant	Construction and subsequent operation of the plant is likely to create number of job opportunities and income prospects for the locals
10.	Sustainability of the plant / scheme	- Ensure conservation of natural and manmade resources	The proponent should ensure long term sustainability of the plant
11.	Social conflicts and frictions with neighbourhood community	- Avoid interaction with the local neighbourhood community - Avoid visiting houses of the neighbourhood community by the labour or other persons - Respect social, cultural and religious beliefs of the neighbourhood community	Avoidance of the friction with the neighbourhood communities is an important issue and the proponent must ensure that no friction takes place

6

STAKEHOLDERS' CONSULTATIONS

6. STAKEHOLDERS' CONSULTATIONS

6.1 Objectives and Rationale of Consultations

The primary objective of the stakeholders' consultations was to learn and know the apprehensions, concerns, and opinions of the key stakeholders over environmental implications of the project. The consultation sessions also served as a source of first-hand information about expectations of the community and beneficiaries of the project. Dialogue with the stakeholders and recording their concerns at appropriate stages of the project can help to tailor the project in line with stakeholders' aspirations and therefore likely to promote public acceptance of the project and its sub-components.

6.2 Identification of the Relevant Stakeholders

The consultation process began with identification of the most pertinent stakeholders. Efforts were made to identify the relevant stakeholders through a systematic process based on the nature and degree of their actual and perceived stakes in the project. Tables 6.2a and 6.2b are the various categories of the stakeholders and the nature of their stakes into the project pertaining to both construction and operation of the plant:

Table 6.2a: Stakeholders of the Project and Nature of their Stakes (Construction Phase)

Category	Stakeholders	Nature of the Stakes
	Design & Construction Stage	
Project Funding Agency	Proponent	All those stakes which a funding agency would have i.e., achieving the desired objectives and reaping benefits of investment into the project
Project Sponsoring Agency	Proponent	That the project is carried on smoothly in accordance with scheduled timeline
Project Implementing Agency	Proponent Machinery Construction Contractor Sub-contractors and Labour Vendors of machinery, equipment and various goods and services for the Project	That the project is implemented as per schedule and delays on whatsoever account are avoided That all bottlenecks and impediments are removed in a timely and effective manner That the bills are cleared in timely manner and payments are made as per contract agreement
Regulatory Authorities	Environmental Protection Agencies Local District and the Municipal Administration Local Building Control Authority	That constructions under the project conform to applicable building codes, rules, regulations, bylaws, and environmental standards
Project Users/Beneficiaries	Proponent Construction contractors Persons employed at the project Goods & Service providers Others	That the project is completed as per schedule and that they get maximum benefits from the project That the project structures meet with their needs and requirements
Public and Community	Neighbourhood community, Industrialists, Residents, Vendors, Agriculturists and Land owners	That the project activities do not affect their living, business, and civic rights in an adverse manner That the project activities are not harmful for their health, hygiene and aesthetic ambience That the locals are preferred in provision of jobs at the project

Table 6.2b: Stakeholders of the Project and Nature of Their Stakes (Operation Phase)

Category	Stakeholders	Nature of the Stakes
	Operation Stage	
Project Funding Agency	Proponent	That the fruits of investment are fully realized to the desired extent and the objectives are achieved to a satisfactory level
Project Sponsoring Agency	Proponent	That the project operates as a successful venture

Category		Stakeholders	Operation Stage	Nature of the Stakes
Agency				and serves as a role model for replicating similar projects by others
Project Operating Authorities		• Proponent		• That operational bottlenecks are removed in a timely manner and the project's operations carries on smoothly
Regulatory Authorities		• Environmental Protection Agencies • Local District and the Municipal Administration		• That the project remains conformant to the applicable rules, laws and the environmental standards
Project Beneficiaries		• Proponent • Employees and Project Staff • Persons providing services and goods at and for the project • Others		• That the project provides all the services and facilities for which it is to be constructed • That the project is safe and secure from any outside intrusion • That the quality of academics and research at the project university of international standard • The food served at the project facilities (canteens, mess, cafeteria etc.) is of prime standard and quality • That the project activities do not pollute the environment • That appropriate training and capacity building is provided to the project staff • That operation of the project is free from corrupt practices and malades and is geared to serve its underlying objectives • That payment to suppliers are made in a timely manner without any hassle and problems
Public and Community		• Neighbourhood community • Project beneficiaries		• That the project activities do not affect their living, business, and civic rights in an adverse manner • That the project activities are not harmful for their health, hygiene and aesthetic ambience • That the locals are preferred in provision of jobs at the project

6.3 Consultation Methodology

Onsite consultations were held with representatives of the various categories of the stakeholders as were available during field visits of the site. Annex-5 is a list of the persons consulted and interviewed. Additionally, wherever found feasible, general public in the vicinity were also consulted to know their views and concerns over the plant activities. The majority of these consultations were either one to one meetings or small and focused group discussions.

6.4 Issues Discussed

The points listed below are some of the issues discussed during the consultations:

- Are the Construction being undertaken in accordance with applicable codes, rules, and regulations?
- Are the Construction s commensurate to their usage after completion?
- Are the contractors complying with the environmental requirements?
- Are there any concerns apprehensions, and views of the community and the stakeholders over the project activities relating to design, Construction and operational aspects? What are these?
- What are the likely adverse impacts of the project on the various components of the environment i.e. physical, biological, and social components?
- What could be the possible remedies for the concerns and apprehensions? How they concerns can be effectively addressed?
- Any particular and specific personal or site related concerns.
- What steps would be needed to ensure long-term sustainability of the project and the activities under the project?

How the project operations can come up to expectations of the users and or the beneficiaries?

6.5 Outcome of the Consultations

The neighbourhood communities did not express any specific or significant concerns. Interestingly, different stakeholders had different perceptions and different concerns about the project. Some of the concerns and apprehensions relating to various aspects of the project are reproduced below:

6.5.1 Design Aspects

The design aspects need to take into account the relevant engineering codes, byelaws, and the applicable governmental policies.

6.5.2 Construction Aspects

- Delays in construction and its completion are likely to result into escalation of costs.
- Delays in payments to the contractors, sub-contractors, suppliers and the labour can cause delays in the project implementation.
- Delays in handing over the sites and later changes in the drawings and scope of work result into slow progress of construction of the plant.
- Interferences by the local regulatory agencies and the municipal authorities are also likely to cause delays in completion.
- Disorderly and haphazard placement of materials with its attended consequences could be a nuisance for the labour and other persons working on the project.
- Construction related noise could be troublesome for the neighbourhood community.
- Generation of dust and its deposition on exposed surfaces would require frequent dusting.

6.5.3 Operation Aspects

- There could be disruptions and discontinuations in the supply of the machinery and equipment and other materials for timely completion of the project
- There could be non-payment or delayed payment of wages to the work charge and the temporary employees.
- There could be unsatisfactory cleanliness of the premises due to administrative and supervisory lapses.

6.6 Measures to Address the Concerns

Table 6.6 presents a summary of the concerns and apprehensions of the various stakeholders to the project and the plausible measures to address them:

Table 6.6: Summary of Stakeholders' Concerns alongwith Remedial Measures

Persons Consulted	Concerns/Apprehensions	Remedial Measures
Environment Protection Agency	• Environmental and functional compatibility of the project • An institutional setup for addressing the issues and concerns • No or minimal delays at various milestones	• The EMP and the Environmental Guidelines as given in this document will ensure environmental and functional compatibility of the project. • Additionally, the Environmental Safety, Health and Social Management Unit (ESHU) will be setup to manage all environmental and social issues of the project during both Construction and subsequent operation
District Executive Authorities	• The project carries on smoothly without creation of any serious impediments	• The core administration of the project as well as ESHU will ensure smooth functioning of the project without eruption of any unpleasant situation
Project Staff	• Wages are paid in time and no deductions are made therefrom on any count • Good quality and hygienic food is served • Social security cover is provided for the project staff and the labour	• The core administration and the ESHU will ensure that all apprehensions are allayed in a timely manner
Contractors	• Delays in Construction and	• The majority of the contractors' concerns

Persons Consulted	Concerns/Apprehensions	Remedial Measures
	completion of the project and resultant escalation in costs - Delays in clearing of the running bills/ payments - Poor coordination between various departments and functionaries - Changes in the drawings and scope of work - Lengthy and tedious procedural requirements - Interferences by the local regulatory agencies and the municipal authorities	relate to procedural and management issues. The institutional setup proposed for environmental and social management of the project will help solve the problems
Office staff and other employees	- Non-fulfilment of promises by the project authorities - Disruptions in the supply of essentialities like office stationery, diesel for generators, and ink for printers - Non-payment or delayed payment of wages to the work charge and the temporary employees - Unsatisfactory cleanliness of the premises - Lack of appropriate working space for the employees - Lack of space for placing the important record and files - Lack of safe drinking water facility	The majority of the concerns relate to procedural and management issues. The proposed institutional setup will help solve the problems
Neighbourhood community and shopkeepers	- Noise pollution - Dust and air pollution - Disorderly placement of materials - Environmental compatibility of the project - Neighbours are not displaced or their business are not affected - Timely completion of the project - Preference in provision of jobs to locals	- The ESHU will keep constant liaison with the neighbouring community and will resolve all disputes and differences in an amicable manner through negotiations and consultations - Timely completion of the project is ensured - No person is dispossessed or displaced from his land without paying for due compensation - The proponent will give due preference in provision of jobs to the locals provided they otherwise qualify for the job as per the prescribed qualification and applicable conditions

STAKEHOLDER CONSULTATION WITH GOVERNMENT DEPARTMENTS

Sr. No.	Designation and Department	Concerns / Remarks
1.	Assisnant Director Environment - EPA Layyah	It should be ensure that the Solid waste should be manage effectively.
2.	Inspector Environment - EPA	Proposed project area is industrial in nature. Following mitigation measures should be adopted. - The plantation in designated green zones should be carried out. - Proper disposal of the solid waste.

EIAR: Setting-up of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit", Chak 285/TDA, Distt. Layyah
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Superintendent District Council	HSE management measure should be adopted and implemented effectively.
Senior Sub Engineer	Timely implementation of the project. HSE plant should be consulted at source.
Head Clerk	Following measures should be adopted Construction and installation should meet the standard of HSE. Proponent should facilitate to obtain documents for its project.
Social Welfare Officer	The management of the unit must concern with the department for welfare of general public and labour and funds will be donated to needy person and rehabilitation.
DHQLayyah	DHQ HOSPITAL LAYYAH Health of the worker should be checked by the qualified Medical Staff. Solid waste should be managed properly to ensure cleanliness. First aid facility and emergency will be provided to the workers of unit at with the premises.

6.15 Consultation with local Community

The local people of the project consulted and their views were recorded in form of survey and presented in the table annexure.

Sr.	Name	Concerns / Comments
1.	Nadeem Abbas son of Adil Bukhsh	Job Opportunity will arise
2.	Hassan Din S/o Lal Jan din	Business opportunity will enhance
3.	Haji Karam Din S/o Din Muhammad	Bright Future prospective
4.	Muhammad Amjad S/o Ijaz din	Investment will generate
5.	Rafique Ahmad S/o Hassan Din	Economic condition of the community will improve.
6.	Muhammad Ahsan son of Muhammad Islamil	Jobs and economics condition of layman uplift.
7.	Muhammad Subhan S/o Hassan Din	Enhance selling of different products.
8.	Asim Mehmood son of Muhammad Asif	Labour opportunity will be increase.

6.16 Consultation with local Community

The community consultations demonstrated that goodwill towards the project proponent indeed exists. Approval project activities by communities was evident. The consultations were considered a good gesture and were appreciated; especially by men and women. The poverty level is such that communities are looking forward to any project proponent to improve their financial well-being to a great extent. Benefit from the project should be distributed judiciously and equitably among the primary stakeholders in the project area, and the proponent will continue to ensure that this principle is followed in this project and community development program.

6.16.1 Local Employment

Communities in the project area emphasized that local inhabitants should be given priority when people for related works and activities according to their skills.

6.17 Compensation

Compensation shall be paid for any damage if it is there. The compensation process should be transparent.

6.18 Interaction with Local Community

Local work force coming in the project area who will not be aware of the local customs and norms and may result in conflicts with the local community; keeping in mind the sensitive law and order culture of area.

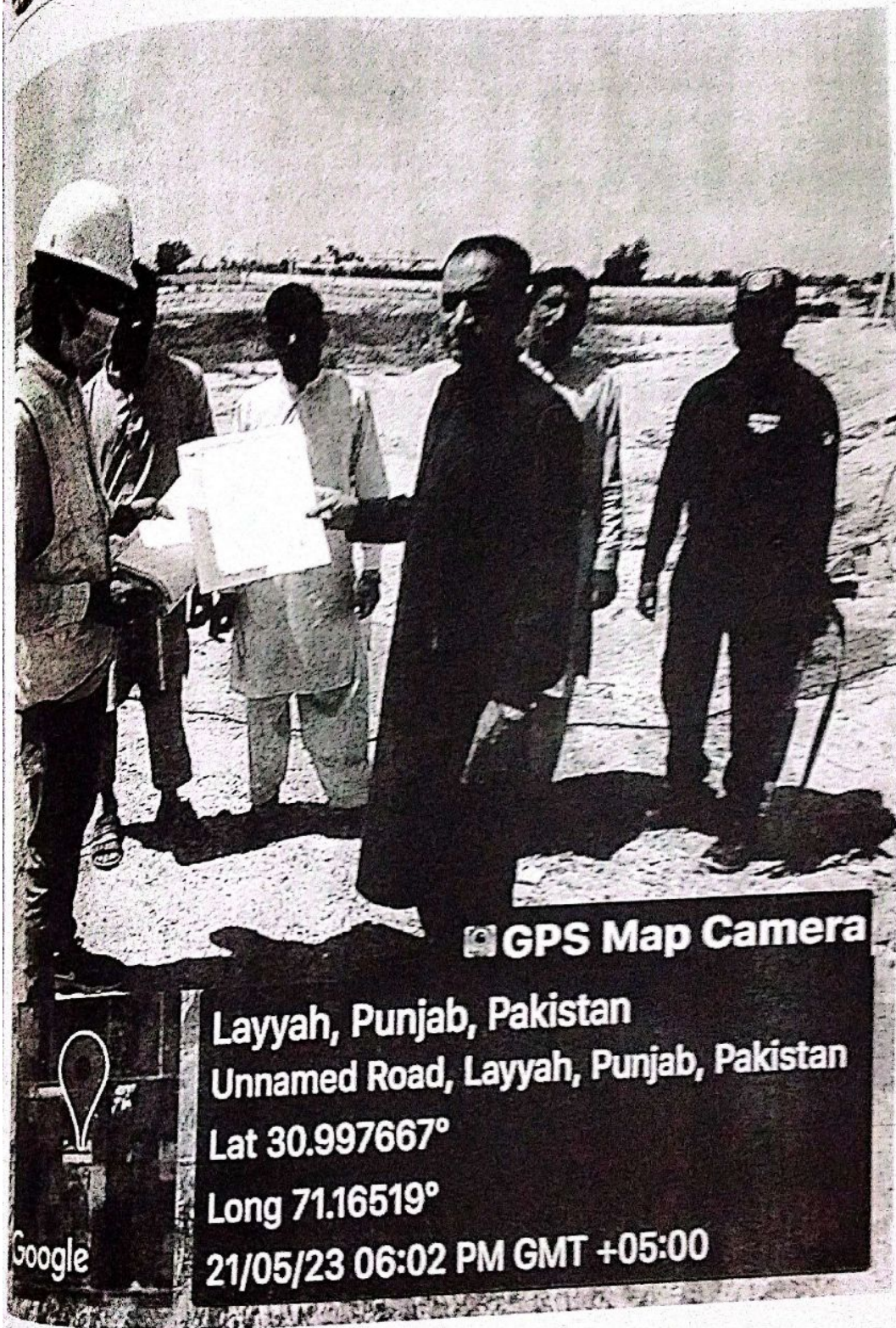


6.19 Settlement/ Relocation

The proposed site land is owned and possessed by proponent. No human population resides within project area. No structure of any significance (cultural, religious, local, recreational or any other) stands on the land selected for the project. No flora or fauna; Belonging to endangered species is found within a safe distance from the site which is to be removed to some other part. Hence, no relocation and resettlement is required. Socio-economic aspects are attached as Annexure-XIV with EIA report.

4.7.6 Project Response

Respondents were in favor of the proposed project as it will raise the employment opportunities for the skilled and unskilled labor. 98% favored the construction of the project keeping in view its importance.



 **GPS Map Camera**

Layyah, Punjab, Pakistan

Unnamed Road, Layyah, Punjab, Pakistan

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Long 71.16519°

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Google

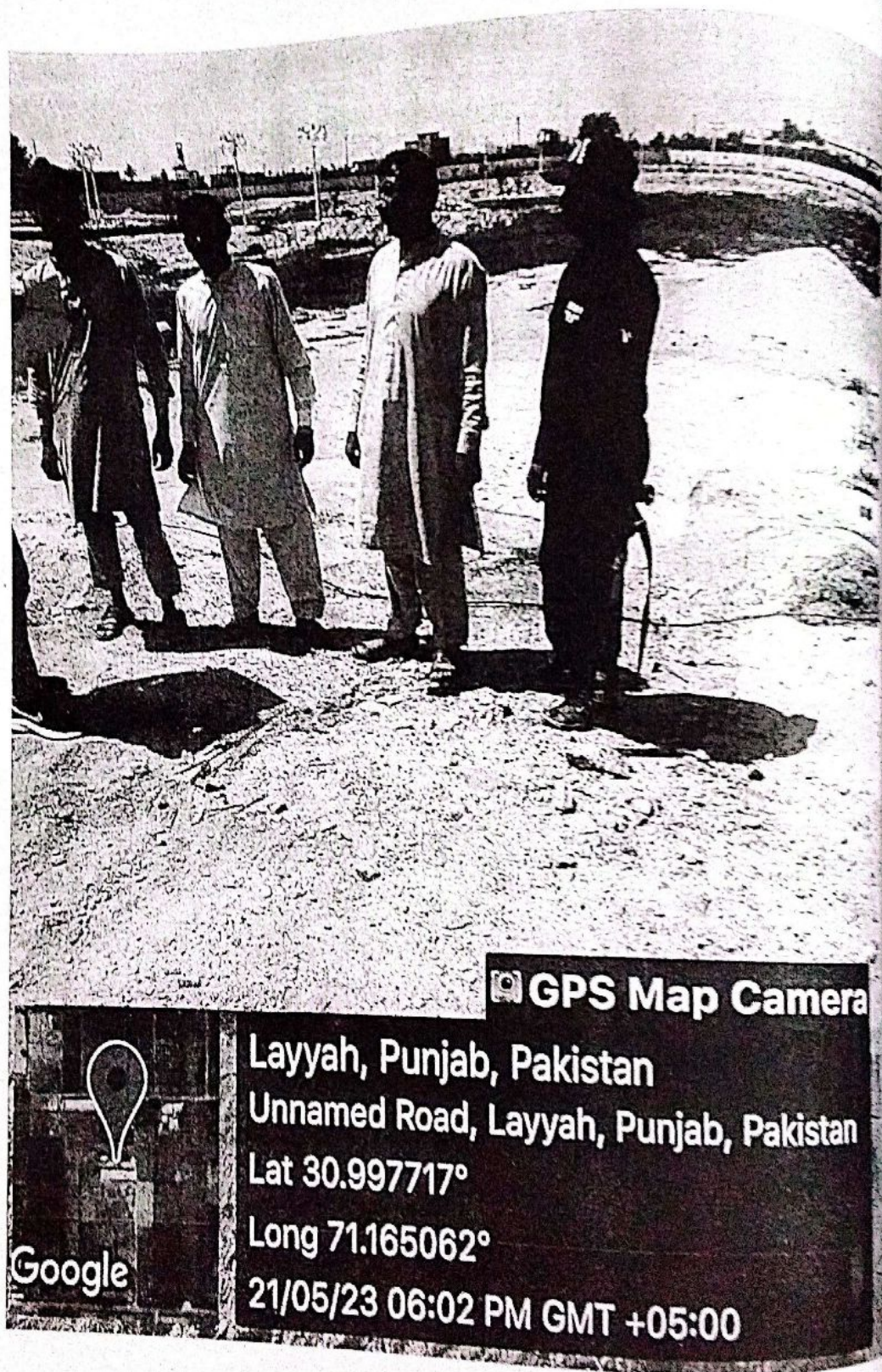
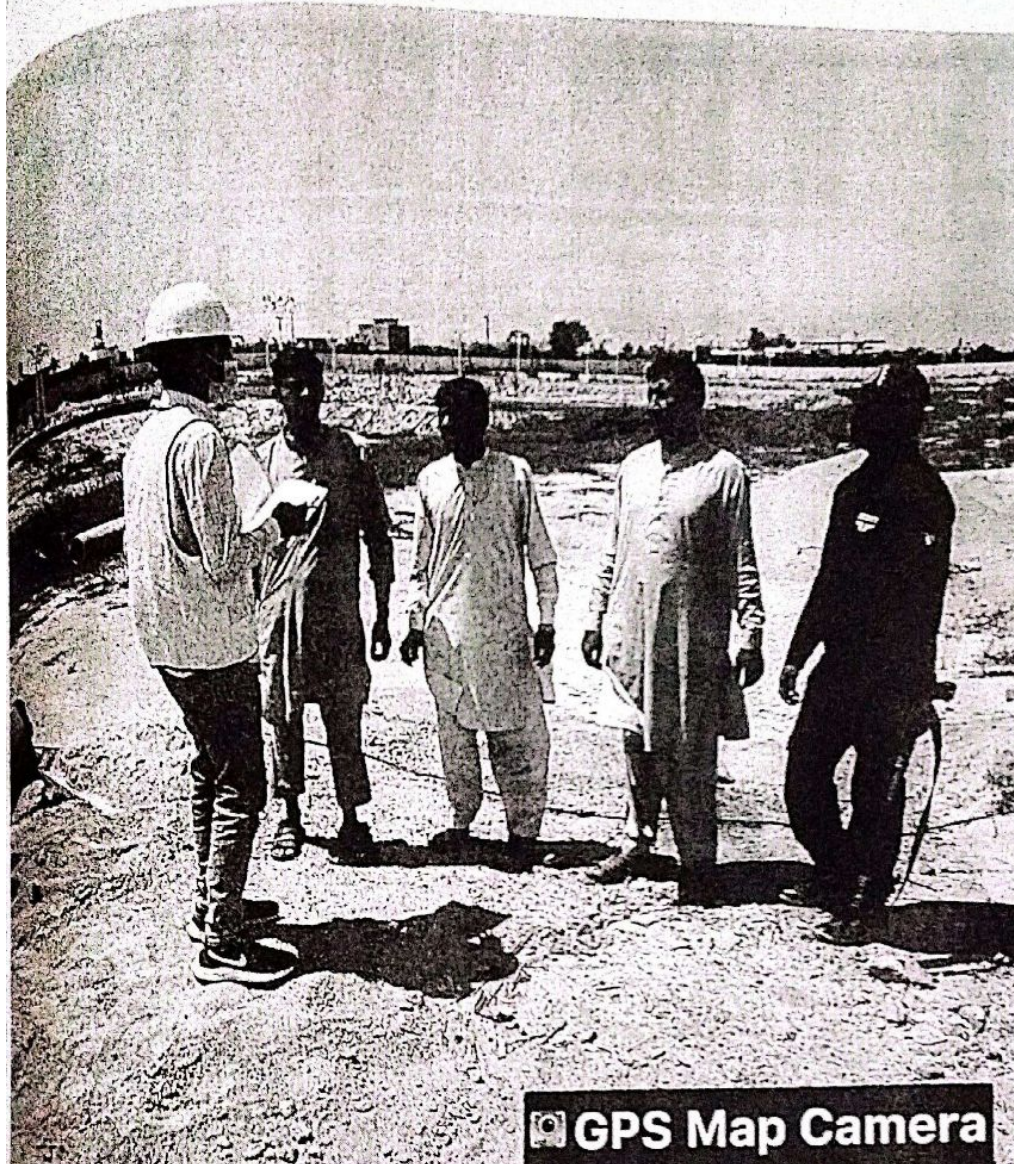


Fig. 6b: Onsite Stakeholders Consultation

EIAR: Setting-up of "Maryam Fatima Enterprises (Fat Melting & Protein Recovery Unit", Chak 285/TDA, Distt. Layyah
Green Revolution, 2023



 **GPS Map Camera**



Layyah, Punjab, Pakistan

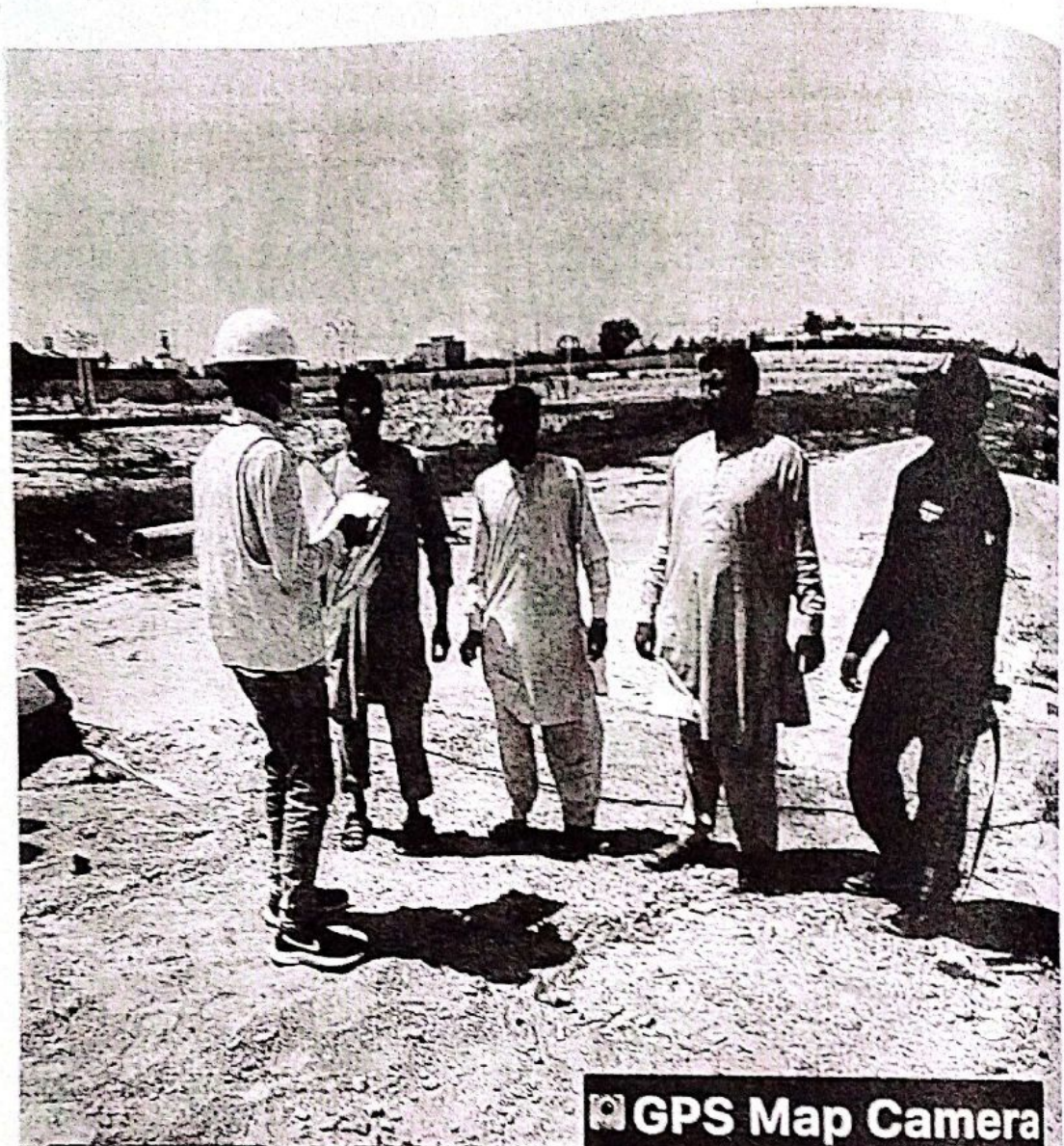
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Long 71.16497°

21/05/23 05:59 PM GMT +05:00

Fig. 6c: Onsite Stakeholders Consultation



 **GPS Map Camera**



Layyah, Punjab, Pakistan

Unnamed Road, Layyah, Punjab, Pakistan

Lat 30.997697°

Long 71.16497°

21/05/23 05:59 PM GMT +05:00

FINDINGS & CONCLUSION



FINDINGS & CONCLUSION

Results of the instant EIAR show that construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]" at a vacant site will be devoid of any serious environmental impacts, whatsoever, interalia for the following reasons:

- ✓ The building will be constructed on a vacant land, owned and possessed by the proponent
- ✓ The machinery will be installed simultaneous with construction of the building
- ✓ There proponent will procure necessary NOC of permissible land use change from the concerned authority
- ✓ The controlled cooking of poultry waste will be of no environmental bearing, provided the recommended mitigation and pollution control measures are enforced in letter and spirit
- ✓ The proponent will apply to the EPA-Pb for environmental approval by submitting the instant EIAR
- ✓ The layout and architectural design of the plant has been prepared by an expert architect and engineer
- ✓ The controlled cooking of the poultry waste is a cleaner process operation. There will not be the generation of any air emissions, wastewaters, effluents, solid wastes during the cooking operation.
- ✓ The foul smells will be effectively controlled by installation of an efficient pollution control system and implementation of good housekeeping practices
- ✓ All the materials and wastes at the premises will be stored securely and safely
- ✓ There will be conserved and minimal usage of freshwater, as effective water reuse will be practised
- ✓ The usage of water at the worksite toilets and washrooms will be just normal for such like plant
- ✓ The setting-up of the plant will not cause disturbance of any environmental parameter or sensitive bio indicators of the site/area
- ✓ The setting-up of the plant will bring-in opportunities of job and employment for the locals and the neighbouring communities around the site
- ✓ The setting-up of the plant will bring-in market competitiveness and the resultant lowering of the costs of the protein meal, which is an important ingredient of the poultry feed, from a healthy market competition

The setting-up of the plant will not cause any adverse or negative impacts on the physical as well as the biological environment of the site. The transitory and measly impacts (if there will be any) will be all negligible and of no eventual consequence at all. As per findings of the EIA, there will not be any impacts of construction, as the project building will be constructed on a vacant land, owned and possessed by the proponent at Chak 285/TDA Road, Tehsil and Distt. Layyah. However, if any tertiary impacts (although none) are discovered at some later stage, it is certain that they will be all mitigable in character. Even after conducting a comprehensive examination of the parametric and the non-parametric aspects concerning construction, the Team of Experts could not find any negative impacts of construction and operation of the plant here. The transient impacts of construction, if any, will be all-reversible and can be made good by implementing the recommended mitigation measures and the environmental management and monitoring plan, as given in this EIA report. To conclude, there will not be any environmental and social impacts of setting-up of the plant. However, if any, are discovered later, they all will be mitigable. In nutshell, the impacts of construction and operation of the plant are all positive in nature and beneficial for the environment, economy and the community.

As far as the operation phase is concerned, there will not be the generation of any air emissions, wastewater and or solid wastes. The operation of the plant, particularly fat melting and cooking of poultry waste for recovery of protein meal, will be of immense advantage and benefit for the community and the environment. The findings of the EIA show that there will not be any exhaustive exploitation and consequential depletion of the local natural resources from any of the operational activities of the plant. Similarly, there will not be the generation of any pollutants, contaminants or wastes from any of the operational activities at the plant, because the plant will be fitted with an efficient and effective pollution control system. In view of the calculated scope and well-defined magnitude of the plant's operations, the local resources shall remain conserved and available for sustainable future development. The construction and operation of the plant will therefore bring-in positive and healthy improvements in the socio-economic environment of the area. It will benefit hundreds of people, locally and distantly. In nutshell, the high-end positive impacts of construction and operation of the plant far outweigh all the low-end negative impacts (if there be any), thereby making it an environmentally sustainable, compatible, feasible and implementable unit.

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ANNEXES



Layout Map & Other Documents

STRUCTURAL NOTES

1. Class "A" bitumen 40/50 with minimum crushing strength of 5000 PSI should be used & joint or seal should be sloped. Vertical installed joint of carriers are prohibited.
2. A steel 5-40 deformation for all dimensions.
3. Concrete 1:2:4 with 4000 psi compressive strength of 7" x 7" cubes after 28 days for footings, beams, slabs, columns and in 6 water retaining structures, concrete 1:2:3 with 4000 PSI compressive strength of 7" x 7" cubes after 28 days.
4. Cement-sand mortar should be used as:
 - a. In foundations 1:4
 - b. Super structure 1" thick 1:5
 - c. Super structure 4" x 6" 1:6
5. Shale ground water table, overland water level, water table should be of R.C.C. 12" x 12" x 8" and beings should be protected by all means so that water may not seep into sub-structure.
6. Concrete clear coverings should be followed:
 - a. Slab 3/4" (bottom)
 - b. Beams 1 1/2" (all sides)
 - c. Columns 1" (all sides)
 - d. Footing 1 1/2" (all sides)
7. Lap length should be followed as:
 - a. 34" x 40"
 - b. 34" x 50"
 - c. 34" x 60"
 - d. 34" x 70"
8. Vertical reinforcement in walls should be provided as per given drawing.
9. Strength of concrete & structure should be provided as per 7" x 7" height & 7" x 7" in other side (in 6 sections) has been provided as the structural drawings.
10. The design is in accordance with IS:456-1978.
11. Footing has been designed for the design with bearing capacity of soil as 1.5 x 10⁶ PSI.

Opening Schedule

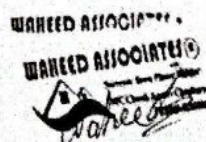
S.N	Description	Size	Qty	Side
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2	Door	3' x 7'	1	Back
3	Door	3' x 7'	1	Left
4	Door	3' x 7'	1	Right
5	Window	3' x 4'	1	Front
6	Window	3' x 4'	1	Back
7	Window	3' x 4'	1	Left
8	Window	3' x 4'	1	Right
9	Window	3' x 4'	1	Front
10	Window	3' x 4'	1	Back
11	Window	3' x 4'	1	Left
12	Window	3' x 4'	1	Right
13	Window	3' x 4'	1	Front
14	Window	3' x 4'	1	Back
15	Window	3' x 4'	1	Left
16	Window	3' x 4'	1	Right
17	Window	3' x 4'	1	Front
18	Window	3' x 4'	1	Back
19	Window	3' x 4'	1	Left
20	Window	3' x 4'	1	Right

SCHEDULE OF AREAS

TOTAL AREA PLOT	27000 SFT
NET AREA PLOT	19440 SFT
OPENING FOR STREET	17700 SFT
COVERED AREA	G.F. 17700 SFT
OPEN AREA	G.F. 19440 SFT
COVERED AREA	G.F. 17700 SFT

LAND INFORMATION

NAME	SAJJAD ALI S/O SAJJAD AL
KHATA	1313-10-0
INTOAL	211616/7145440
PLOT SIZE	
TOTAL AREA	05 KANAL



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DETAILS - PLANS, ELEVATIONS, SECTION, SITE PLAN & LOCATION MAP	
DRAWN BY:-	
Checked By:-	

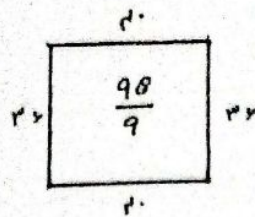
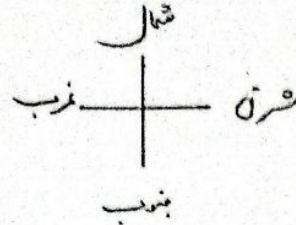
Layout Map

EIAR: Setting-up of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit", Chak 285/TDA, Distt. Laysah
Green Revolution, 2023

Aksh Sajra

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پیمانہ سببہ ۱۰۰۰



بنامہ سال

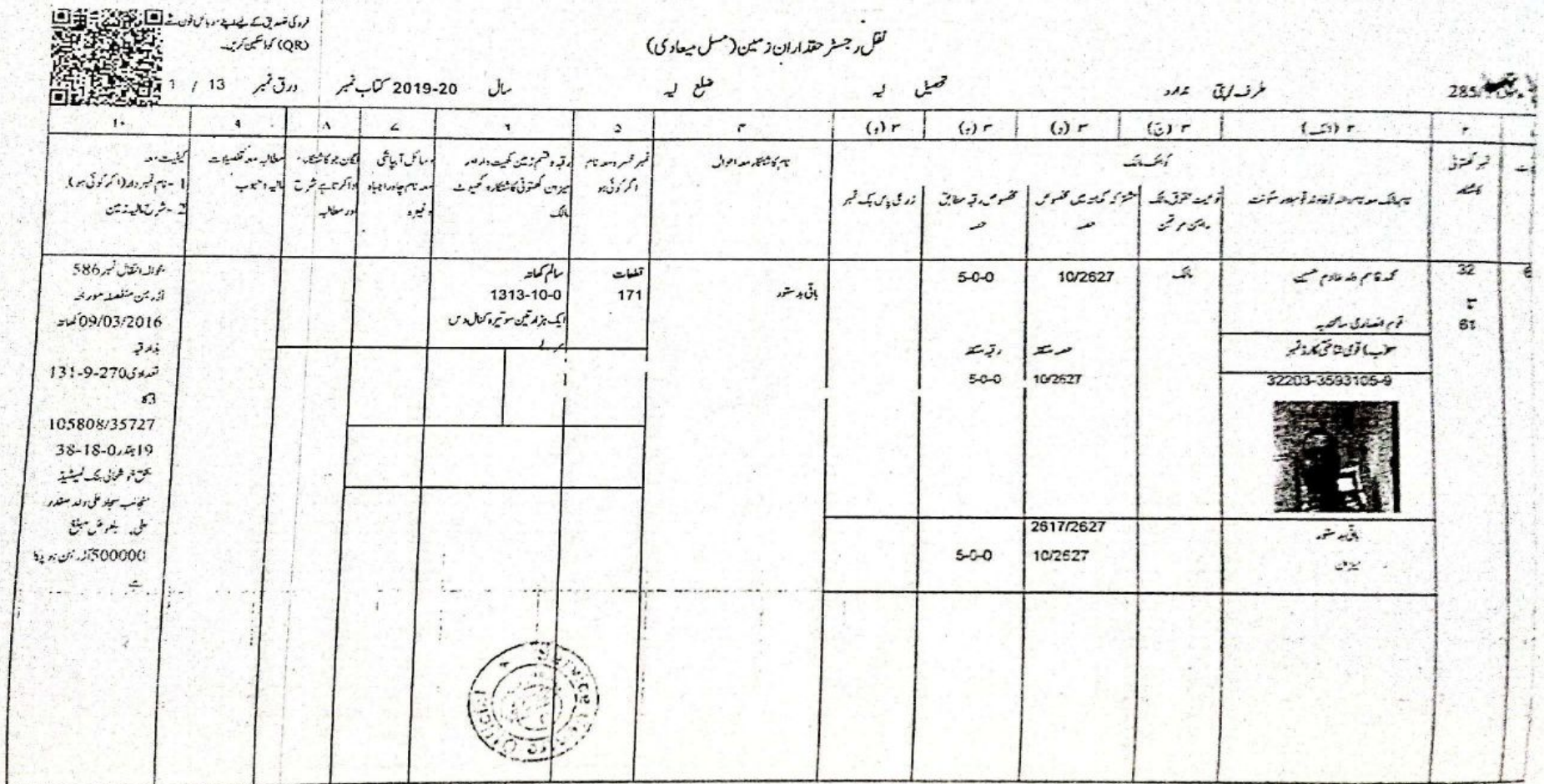
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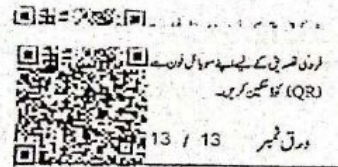
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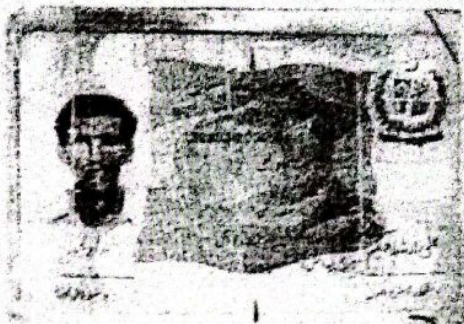
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 S/O :
 Agents :
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 Dated On/Validity :
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 Reason :
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 Low Denomination
 Rs 100/-

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 One Hundred Rupees Only
 FOR AFFIDAVIT
 Ghulam Raza [PB-LAY-91 | Dh



Sh. Muhammad Akbar
Address: 110, South Commercial Street
Kuala Lumpur, Malaysia
Tel: 03-2345 1234
Fax: 03-2345 1234
E-mail: akbar@akbar.com

دوتا بہادر قہرمانوں کا یہ جہاز جسے سارا ملک دیکھ رہا ہے اسے ایک ایسا ہی جہاز کہیں نہ ملے گا۔ یہ ایک ایسا ہی جہاز ہے جسے سارا ملک دیکھ رہا ہے اسے ایک ایسا ہی جہاز کہیں نہ ملے گا۔ یہ ایک ایسا ہی جہاز ہے جسے سارا ملک دیکھ رہا ہے اسے ایک ایسا ہی جہاز کہیں نہ ملے گا۔

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E-STAMP



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 Amount : Rs 100/-



Scan for online verification

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 S/O : MALIK NOOR HUSSAIN
 Agent : Self
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 Amount In Words : One Hundred Rupees Only
 Reason : FOR AFFIDAVIT
 Vendor Information : Ghulam Raza | PB-LAY-91 | Dhori Adda

GHULAM RAZA
 Stamp Vendor
 Dhori Adda Teh. & Distt. Layyah

ATTESTED
 Si. Mubashir Akram
 Advocate, Oath Commissioner
 District Court Layyah
 Appointed on 11.03.2023
 Cell # 0300 7643744 | E-mail # 1171
 UANIC # 32203-5703207
 Tsk Layyah

Type "eStamp + 16 digit eStamp Number" send to 8109

بیان حق
 ۱۔ مکمل طور پر اس بات کی تصدیق کرتا ہوں کہ میں نے اس عہد نامے کی تمام شرائط پوری کی ہیں اور اس میں کوئی تبدیلی نہیں کی ہے۔
 ۲۔ میں نے اس عہد نامے کی تمام شرائط پوری کی ہیں اور اس میں کوئی تبدیلی نہیں کی ہے۔
 ۳۔ میں نے اس عہد نامے کی تمام شرائط پوری کی ہیں اور اس میں کوئی تبدیلی نہیں کی ہے۔
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 ۱۰۔ میں نے اس عہد نامے کی تمام شرائط پوری کی ہیں اور اس میں کوئی تبدیلی نہیں کی ہے۔

共六册 全一册



Scan for online verification

GHULAM RAZA
Stamp Vendor
Ukhti Aqda Tpk & Dns Layan

ATTESTED

Sh. Muhammad Ali
Advocate, D. H. Congress Inter
District Co. [unclear]
Appointed on 11-1-22 to 25-1-22
Cell # 8205-78434 Licence # 1657
Add # 32205-87031 AL-1
Pat Extension [unclear]

Type "eStamp + 16 digit eStamp Number" send to 8100

[illegible]

11

سید احمد علی

CHIC of proponent

PAKISTAN National Identity Card

Name: **Muhammed Qasim**

Father Name: **Khadim Hussain**

Gender: **M** Country of Stay: **Pakistan**

Identity Number: **32283-3593105-9** Date of Birth: **15.07.1987**

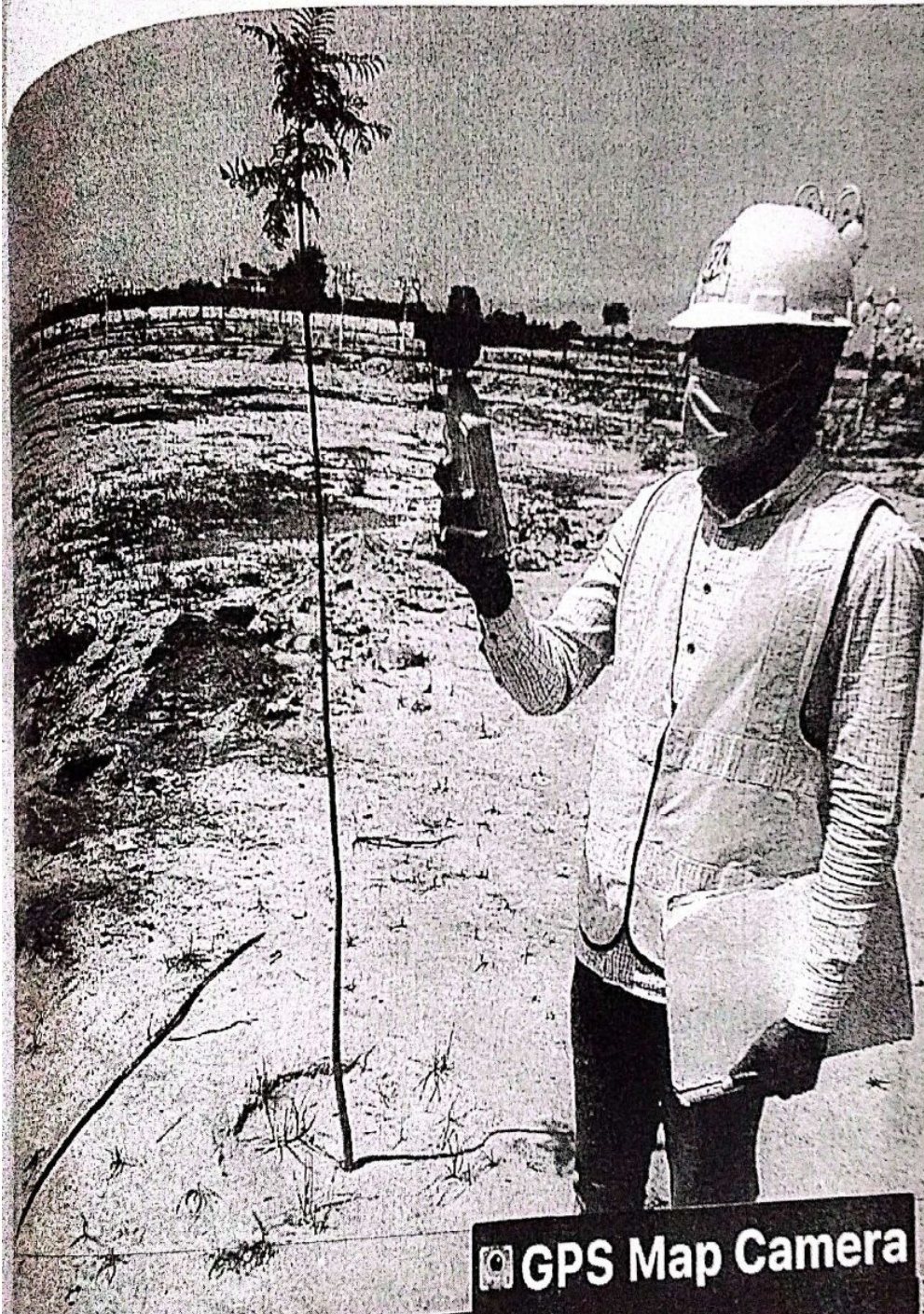
Date of Issue: **07.04.2021** Date of Expiry: **07.04.2031**

Holder's Signature

32283-3593105-9

564281131868

گمشدہ کارڈ ملنے پر قریبی لیئر کس میں ڈال دیں



 **GPS Map Camera**

Layyah, Punjab, Pakistan

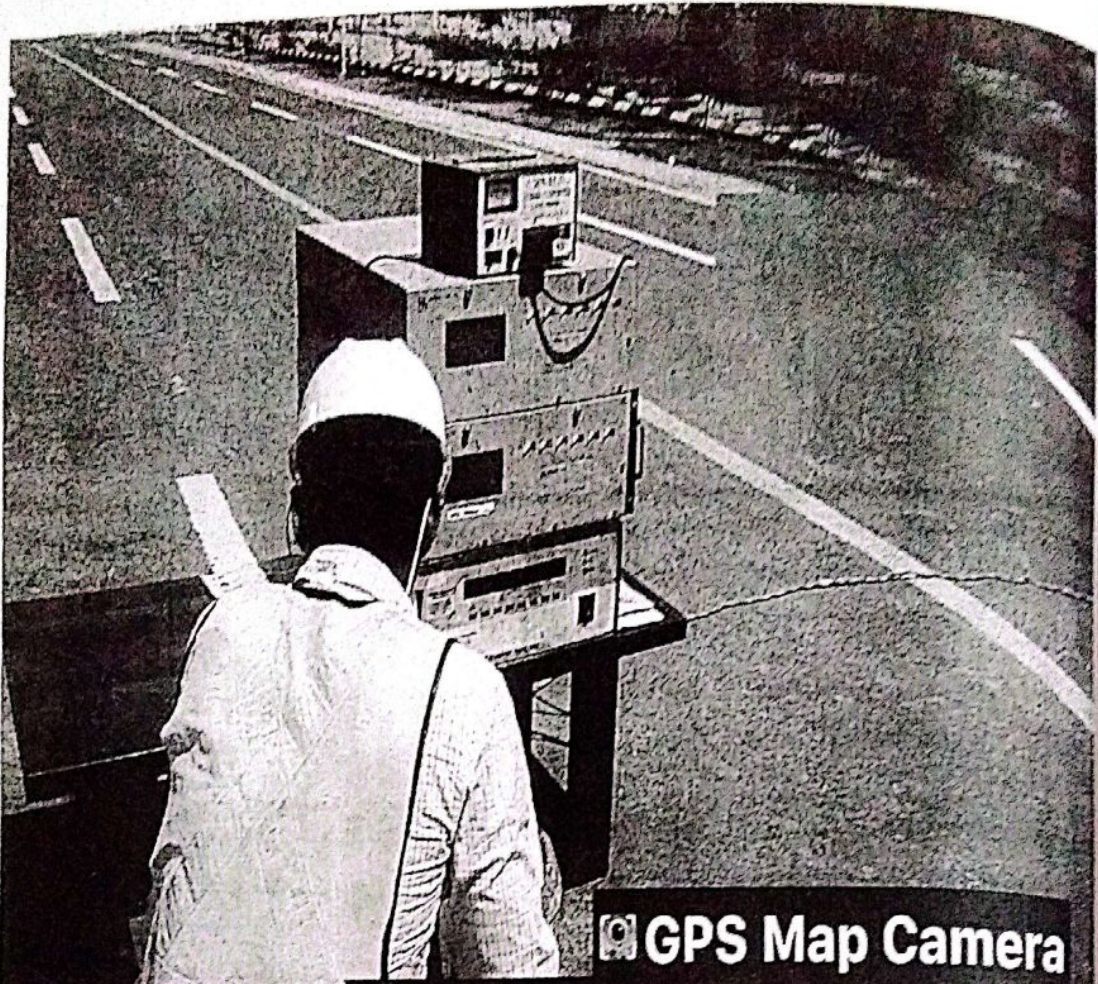
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Lat 30.997702°

Long 71.165223°

21/05/23 06:04 PM GMT +05:00





 **GPS Map Camera**

Layyah, Punjab, Pakistan

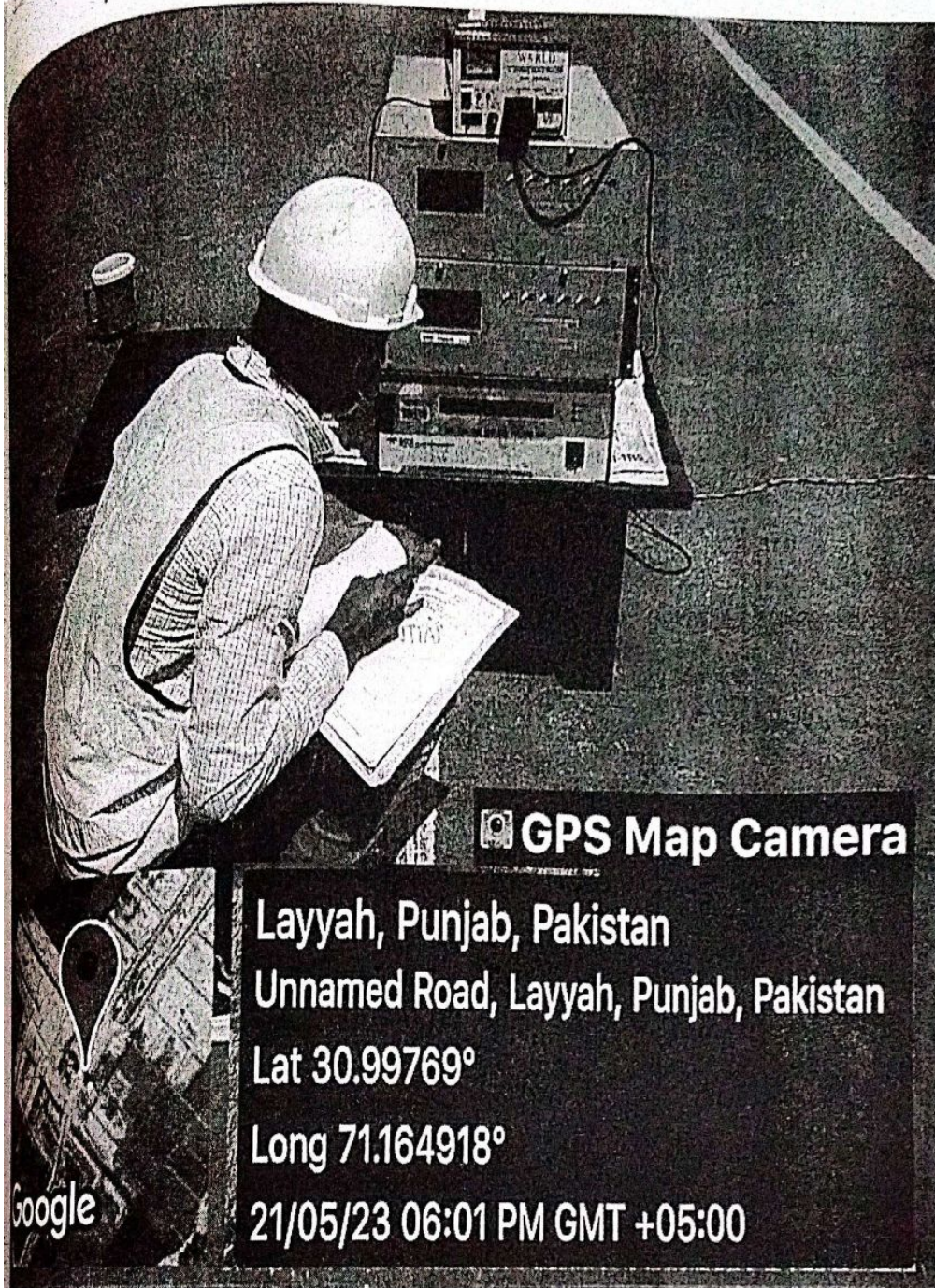
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Long 71.16519°

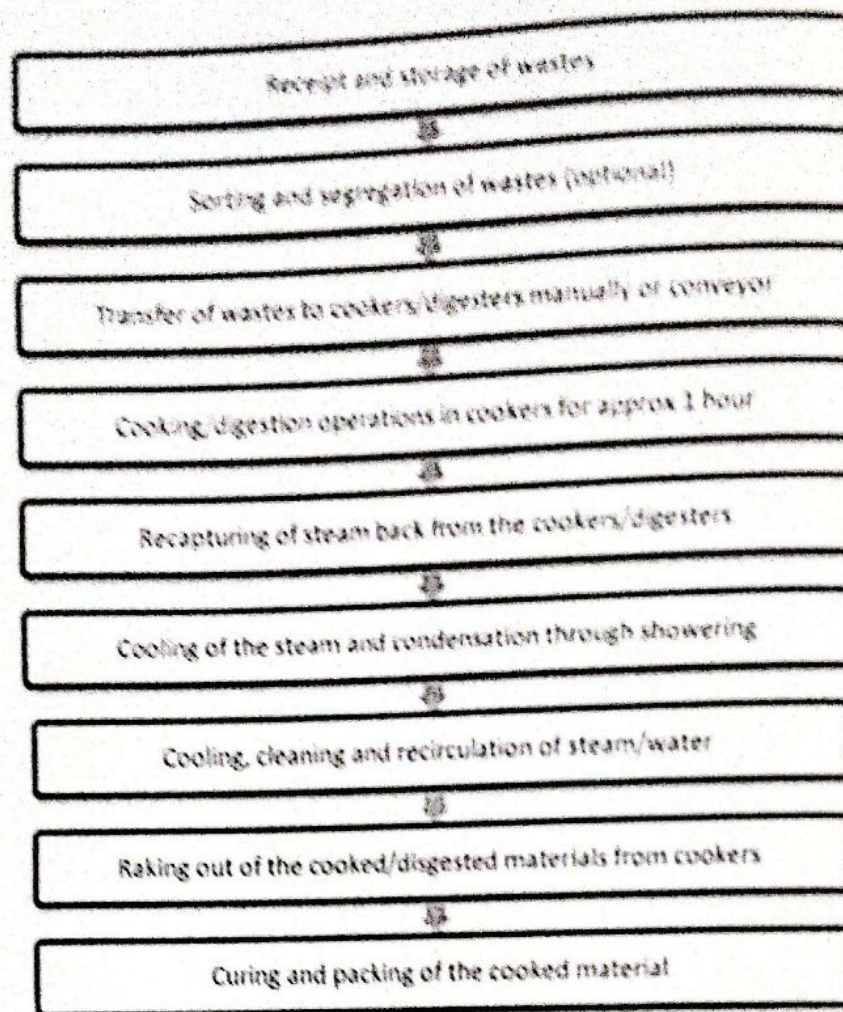
21/05/23 06:02 PM GMT +05:00







Process Flowchart



Persons Interviewed & Consulted

Name and Designation

Muhammad Qasim
Owner/Proponent
Maryam Fatima Enterprises
Chak No. 285/TDA, Tehsil and District Layyah

Hassan Nawaz
General Manager
Maryam Fatima Enterprises
Tehsil and District Layyah

Naeem Akbar
Production Manager
Maryam Fatima Enterprises
Tehsil and District Layyah

Mr. Muhammad Arshad
Assistant Director (Environment)
District Layyah

Neighbouring industry owners/operators/employees/staff

Neighbouring residents

Local NGOs

Local public representatives

Others



Survey Form at Project Location

Survey of the Project Area and Public Consultation Questionnaire
Regarding Project in the Context of Environmental Impact Assessment

M/S Maryam Fatima Enterprises
Chak No. 285/TDA Tehsil and District Layyah

- | | |
|---|--|
| 1. Name of the person interviewed: | Nadeem Abbas son of Adil Bukhsh |
| 2. Age: | 35 |
| 3. Marital Status: | Married |
| 4. If Married No. of Children: | 4 |
| 5. Designation / Profession : | Labour |
| 6. Qualification : | Middle |
| 7. Address: | Layyah |
| 8. Do you know this project : | Yes, by my friend |
| 9. What do you think about the project: | Yes, its good project and will create job opportunity |
| 10. What do you think would be the positive/negative effect of the project? | Positive effect of uplift the economy of the country |
| 11. What will be Health and safety issue due to this project in your point of view? | No health issue in my opinion, as it is simply the construction work |
| 12. Would you like to add anything else? | Nothing |



Survey of the Project Area and Public Consultation Questionnaire
Regarding Project in the Context of Environmental Impact Assessment

Annexes

M/S Maryam Fatima Enterprises
CHak No. 285/TDA Tehsil and District Layyah

Name of the person interviewed:

Hassan Din S/o Lal Jan din
45

Age:

Married

Marital Status:

3

No. of Children:

Designation / Profession :

Guard

Qualification :

Middle

Address:

Layyah

Do you know this project :

Yes, by my relative

What do you think about the project:

Yes, its good project and it will benefit workers

What do you think would be the positive/negative effect of the project?

Positive effect of uplift the economy of the country

What will be Health and safety issue due to this project in your point of view?

No health issue in my opinion, as it is simply the
construction work

Would you like to add anything else?

Nothing



Survey of the Project Area and Public Consultation Questionnaire
Regarding Project in the Context of Environmental Impact Assessment

M/S Maryam Fatima Enterprises
CHak No. 285/TDA Tehsil and District Layyah

- | | |
|---|--|
| 1. Name of the person interviewed: | Haji Karam Din S/o Din MUhammad |
| 2. Age: | 40 |
| 3. Marital Status: | Married |
| 4. If Married No. of Children: | 5 |
| 5. Designation / Profession : | Guard |
| 6. Qualification : | F.A |
| 7. Address: | Layyah |
| 8. Do you know this project : | Yes, by my colleague |
| 9. What do you thing about the project: | Yes, its good project and it will benefit workers |
| 10. What do you think would be the positive/negative effect of the project? | I don't know much, but it will provide jobs |
| 11. What will be Health and safety issue due to this project in your point of view? | No health issue in my opinion, as it is simply the construction work |
| 12. Would you like to add anything else? | Nothing |



Survey of the Project Area and Public Consultation Questionnaire
Regarding Project in the Context of Environmental Impact Assessment

M/S Maryam Fatima Enterprises
Chak No. 285/TDA Tehsil and District Layyah

1. Name of the person interviewed: Muhammad Amjad S/o Ijaz din
2. Age: 32
3. Marital Status: Married
4. If Married No. of Children: 3
5. Designation / Profession: Labour
6. Qualification: Primary
7. Address: Layyah
8. Do you know this project: Yes, by my relative
9. What do you think about the project: Yes, Its good project and it will benefit workers
10. What do you think would be the positive/negative effect of the project?
Positive effect of uplift the economy of the country
11. What will be Health and safety Issue due to this project in your point of view?
No health issue in my opinion, as it is simply the construction work
12. Would you like to add anything else? Nothing



Survey of the Project Area and Public Consultation Questionnaire
Regarding Project in the Context of Environmental Impact Assessment

M/S Maryam Fatima Enterprises
Chak No. 285/TDA Tehsil and District Layyah

- | | |
|---|--|
| 1. Name of the person interviewed: | Rafique Ahmad S/o Hassan Din |
| 2. Age: | 38 |
| 3. Marital Status: | Married |
| 4. If Married No. of Children: | 1 |
| 5. Designation / Profession : | Guard |
| 6. Qualification : | Middle |
| 7. Address: | Layyah |
| 8. Do you know this project : | Yes, by my friend |
| 9. What do you thing about the project: | Yes, a good project, as it will provide job opportunity |
| 10. What do you think would be the positive/negative effect of the project? | Positive effect of uplift the economy of the country |
| 11. What will be Health and safety issue due to this project in your point of view? | No health issue in my opinion, as it is simply the construction work |
| 12. Would you like to add anything else? | Nothing |

Survey of the Project Area and Public Consultation Questionnaire
Regarding Project in the Context of Environmental Impact Assessment

M/S Maryam Fatima Enterprises
CHak No. 285/TDA Tehsil and District Layyah

Name of the person interviewed:

Muhammad Ahsan son of Muhammad Islamil

25

Married

2

labour

Primary

Layyah

Yes, by my relative

Yes, its good project and it will benefit workers

Positive effect of uplift the economy of the country

No health issue in my opinion, as it is simply the
construction work

Nothing

Do you know this project :

What you think about the project:

What you think would be the positive/negative effect of the project?

Will be Health and safety issue due to this project in your point of view?

Do you like to add anything else?



Survey of the Project Area and Public Consultation Questionnaire
Regarding Project in the Context of Environmental Impact Assessment

M/S Maryam Fatima Enterprises
CHak No. 285/TDA Tehsil and District Layyah

1. Name of the person interviewed: Muhammad Subhan S/o Hassan Din
2. Age: 33
3. Marital Status: Unmarried
4. If Married No. of Children:
5. Designation / Profession : Guard
6. Qualification : Middle
7. Address: Layyah
8. Do you know this project : Yes, by my relative
9. What do you thing about the project: Yes, its good project and it will benefit workers
10. What do you think would be the positive/negative effect of the project?
Positive effect of uplift the economy of the country
11. What will be Health and safety Issue due to this project in your point of view?
No health issue in my opinion, as it is simply the construction work
12. Would you like to add anything else? Nothing

Figure 1

THE UNIVERSITY OF CHICAGO
DIVISION OF THE PHYSICAL SCIENCES
DEPARTMENT OF CHEMISTRY

Socio-economic information was gathered through different techniques and methodologies and is derived from primary and secondary sources. Primary data were collected through following data collection tools: (i) Village profiles; (ii) Socio economic survey; Village profiles were carried out for all villages/villages falling under the area. An introductory leaflet about basic information of the project was prepared in Hindi and was distributed among the people at public places. This helped the people to understand about the project and its objectives. After one week the area was revisited by the team of experts and again asked the people about the project in the form of well designed and survey questionnaire.

姓名: 王明

1992-1993

1992

2000年12月1日 星期三

any impact on natural vegetation, land and properties.

1. Introduction

...for the local people

... effects of the project

THE

...of the project by the people of the area

Environmental Assessment report

of the society were included to reflect the true and unbiased opinion. From number 1 to 100 of the project area were interviewed. The officers at district level were approached to have a list of the project. The people who were interviewed through a questionnaire which showed the

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Survey of the Project Area and Public Consultation Questionnaire
Regarding Project in the Context of Environmental Impact Assessment

M/S Maryam Fatima Enterprises
CHak No. 285/TDA Tehsil and District Layyah

1. Name of the person interviewed: Asim Mehmood son of Muhamad Asif
2. Age: 56
3. Marital Status: Married
4. If Married No. of Children: 4
5. Designation / Profession : Tea Stall Owner
6. Qualification : Middle
7. Address: Layyah
8. Do you know this project : Yes, by my relative
9. What do you think about the project: Yes, Its good project and it will benefit workers
10. What do you think would be the positive/negative effect of the project?
Positive effect of uplift the economy of the country
11. What will be Health and safety issue due to this project in your point of view?
No health issue in my opinion, as it is simply the construction work
12. Would you like to add anything else? Nothing



Public Consultation and Information Disclosure Socio-economic Survey of the Project Area

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

Methodology

Identification of stakeholders

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

- Local people
- Affected Communities
- Proponents
- Management of unit
- Government Agencies
- NGO
- Influential people
- Technical persons
- Poor People

Techniques for Public Consultation

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

- Provision of material / information in easy language
- Providing sufficient time to understand
- Providing discussion to understand the information in a friendly way
- Portraying the actual Issues relating to the project
- Discussion at the place which has easily access to the people
- Selection the time when maximum people are available Selection of influential people of project area
- Including of poor people
- Selection of people who give true presentation of community make up Including technical people who has clear knowledge of on the issues relating to unit.
- Concerned government departments were selected who had liaison with the execution of the project and environmental approval.

Public Meetings and Group discussions

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

Convenient Time and Place

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

Non-Government Organization

NGO are working in the area which are mostly exploiting

Limitations of the Public Consultation

We tried our best to include all segments of life in to account according to education and professions as per local distribution of the social formation. But we could not include the enough women in public consultation

process due to closeness of the society for women exposure to alien people and social taboo.

Questionnaire

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

- Socioeconomic background
- Positive impact of the Zodiac
- Unit Acceptance level of the Project.

Public Consultation

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

- Management of poultry unit
- Nobles of the area.
- Shopkeepers
- Farmers

Labors

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

Issues Discussed

Following issues were discussed during the stakeholder consultation: Personal information

- Education status
- Income level
- Residence status
- Information about project
- Possible impacts on natural vegetation, land and properties;
- Beneficial factors and involvement
- Opportunities for the local people.
- Adverse effects of the project
- Scope of the report
- Acceptance of the project by the people of the area
- Scope of the environmental assessment report

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

	49	
	1	
Level:		
	15	30%
	20	40%
	10	20%
	2	4%
	3	6%
	0	0%

Occupation:

Farmer	20	40%
Labour	15	30%
Shopkeeper	10	20%
Government Service	5	10%

Water Pollution Problem:

Concerned about water pollution	0	0%
Don't show any concern about water pollution.	50	100%

Employment chances Direct and Indirect:

Yes	50	100%
No	0	0%

Consent on project Implementation:

Yes	50	100%
Conditional (Yes)	0	0%
No	0	0%

Apprehensions of the people of the area

- Low employment offer to local people during operation phase
- Social work in the area
- Health dispensary

Mitigation of the Peoples Apprehensions

- No resettlement in involved
- Waste water will be treated before disposal
- Big opportunity for the local people during construction phase and small scale chances of job during operational phase.
- Parking of trolleys and trucks will be done within factory premises.
- It will create employment opportunities.
- Project management will give priority to local people for employment
- Social welfare work through community uplift.



Emergency Preparedness and Response Plan

LPG Unit will be prepared to combat with any emergency, according to risk assessment carried out during site visit; the potential emergency scenario might be fire, first aid and security event.

In case of Fire

Fire safety management plan has been provided above.

In case of external threats or site Security:

LPG Plant will arrange 24/7 two armed security staff.

Goals of Disaster Management

Following are the aims of Emergency preparedness plan for the factory:

Reduce, or avoid, losses from hazards Assure prompt assistance to victims Achieve rapid and effective recovery.

Fire and Evacuation

In the Event of a Fire, Pull the Fire Alarm and Call 1122. If you see smoke or flames: Use CARE:

- Contain the fire by closing all doors as you leave
- Activate the nearest Fire Alarm pull station (Pull stations are located near building exits)
- Report the fire by dialing 1122
- Evacuate or extinguish (In most cases, it is best to Evacuate)

Use a Fire Extinguisher only if:

- You have been trained
- You have your back to an unobstructed exit
- You have a fully charged and proper type unit for the fire you are fighting
- The fire is contained, and you have reported the fire by Fire Alarm or activation
- Everyone else has left the area
- There is little smoke or flames

Never fight a fire if:

- It has left its source of origin
- You are unsure of the type of extinguisher you need or have
- If you can't control the fire within 30 seconds, abandon your efforts, close the door(s) and evacuate immediately

Building Evacuation

You should familiarize yourself with the evacuation routes. If an evacuation order is issued for your building, or if it were necessary to evacuate due to an emergency, fully cooperate with Safety and Security/Emergency personnel and:

- Take only keys, wallets and essential belongings with you
- If possible wear weather appropriate clothing
- If you are the last one to exit your room close, and lock doors Leave the building immediately
- Do not investigate the source of the emergency Walk, don't run, to the nearest exit
- Use stairs, not elevators
- Assist people with special needs
- If there is no immediate danger, persons with disability/mobility limitations should shelter in place and call Safety and Security at phones to report location and number of people needing assistance
- If there is imminent danger and evacuation cannot be delayed, the person with a disability should be carried or helped from the building in the best and fastest manner (the person with the disability is the best authority as to how to be moved out of the building)
- If you are unable to evacuate, call Safety and Security at and report your location
- As you make your way out, encourage those you encounter to exit as well
- Follow instructions of the Department of Safety and Security or other identified emergency personnel



- Wait for instructions before returning to your building after an evacuation

Medical Emergency

- If someone is injured or becomes ill:
- Stay Calm
- Dial 1122 and explain the type of emergency, the location, condition, and number of victims
- Let the dispatcher know of any safety hazards – chemical spill, fire, fumes, etc. Do not hang up unless told to do so by the dispatcher
- Do not move the victim unless there is danger of further injury if s/he is not moved. Render first-aid or CPR only if you have been trained
- Do not leave the injured person except to summon help. Comfort the victim until emergency medical services arrive
- Have someone stand outside the building to flag down the ambulance and/or Safety and Security when they reach the vicinity

Bomb Threat

If you receive a bomb threat, remain calm and:

- 1) Obtain as much information as possible:
 - Write down the number from where the call is coming
 - Write down the exact time of the call
 - Write down as accurately as possible the statements made
 - Listen to the voice to determine the sex, age, accents, lisps, tone, etc. (Note any distinguishing feature)
 - Listen for background noises
 - Try to signal for someone else to also listen on the telephone line, if possible
 - Do not hang up and stay on the line as long as possible; wait for the caller to hang up
- 2) Keep the bomb threat caller talking, and ask as many questions of the caller as you can:
 - When will the bomb go off? How much time remains?
 - Where is the bomb located?
 - What does it look like?
 - What kind of bomb is it?
 - How do you know about this bomb?
 - Why was it placed here?
 - Who are you?
 - What is your name?
- 3) Call to Department of Safety and Security

Utility Failure and Natural Disaster

These may include electrical outages, plumbing failure/flooding, gas leaks, steam line breaks, ventilation problems, elevator failures, etc.

- Remain calm
- If the building must be evacuated, follow the instructions on Building Evacuation. Unplug all electrical equipment (including computers) and turn off light switches. Use a flashlight. Do not light candles or use other kinds of flames for lighting
- If worker is trapped in an elevator, advise them to stay calm and tell him you are getting help, use the Call Button of Phone to call for help

Earthquakes

Earthquakes are more common in the Pakistan, In the event of an earthquake:

- Stay away from large windows, shelving systems, or tall room partitions
- Get under a desk, table, door arch, or stairwell
- If none of these is available: move against an interior wall and cover your head with your arms
- Remain under cover until the movement subsides
- After the shaking stops, survey your immediate area for trapped or injured persons and ruptured utilities (water, gas, etc.)
- Do not evacuate until instructed by emergency personnel



- After an earthquake:
- Put on enclosed shoes to protect against broken glass
- Evacuate if the building seems unsafe or if Instructed to do so



Water Management Plan

Construction Phase

To prevent degradation and to maintain the quality of water sources, adequate control measures have been proposed to check the surface run-off, as well as uncontrolled flow of water into any water body. Following management measures are suggested to protect the water quality during the construction phase.

- Avoid excavation during monsoon season.
- Wastewater channels from the site would be connected to septic tank during construction and operation.
- To prevent surface and groundwater contamination by oil grease, leak proof containers should be used for storage and transportation of oil/grease. The floors of oil/grease handling area should be kept effectively impervious. Any wash off from the oil/grease handling area or workshop shall be drained through impervious drains, clarifiers or oil/water separators shall be constructed and effluent should be treated appropriately before releasing it.
- Construction activities generate disturbed soil, concrete fines, oil and other wastes. Onsite collection and settling of storm water, prohibition of equipment wash downs, and preventive of soil loss and toxic releases from the construction site are necessary to minimize water pollution.
- All stacking and loading areas should be provided with proper garland drains equipped with baffles to prevent runoff from the site

Operation phase

In the operation phase of the project, water conservation and development measures need to be taken including all possible potential for conservation of water, reuse, rainwater collection in reservoirs, and recycling of water. These could be in the following form:

- Water source development
- Minimizing water consumption
- Promoting reuse water after treatment
- Water source development shall be practiced by installation of well-designed water extraction pumps.

Minimizing water Consumption

Implementing water efficient fixtures such as 3 litres WC flushing cistern will minimize water consumption, sensor operated urinals and taps to minimize the wastage of water together with other water conservation measures. Furthermore, to ensure ongoing water conservation, an employee education and awareness program will be introduced for the employee of the unit. Dry type urinals will also be selectively.

Domestic usage

Use of water efficient plumbing fixtures uses less water with no marked reduction in quality and services. To install water less W.C. and urinals, this will help in conserving sufficient quality of water.

Leak detection and repair techniques

- Sweep with a broom and pan where possible, rather than hose down for external areas;
- Awareness campaign to disseminate knowledge on strategies and technologies that can be used for water conservation.
- Standard water information packet may be prepared and distributed. The information should include water conservation plans, methods being adopted in the complex and a list of essential and non-essential water uses.
- As new conservation efforts are implemented, the manager will communicate these changes accordingly.
- Paper methods of water use will be placed in the toilets and other areas of water consumptions
- Promoting reuse of water after treatment and development of closed loop systems.

Following section details the wastewater scheme suggested for the project.

- Wastewater management
- Sanitation infrastructure shall comprise of wastewater collection and conveyance system. The wastewater will be collected in the septic tanks



Noise Management Plan

No residential colonies are present near project location; moreover, the Project not intends to use any machinery. Only source for noise pollution will be generator, it is recommended to place generator 100 ft away from workers work place. Noise levels were measured with noise meter. Noise levels at site are presented below.

Construction phase

To mitigate the impact of noise from construction equipment during the construction phase and other machinery (generator) during operation phase the following measures are recommended for implementation:

Job rotation and hearing protection

Workers employed in high noise areas will be rotated. Earplugs/muffs or other hearing protective wear will be provided to those working very close to noise generating machinery.

Operations Phase

To mitigate the impact of noise from diesel generator sets during the operational phase, following measures are recommended for implementation:

- noise emission control technologies
- Greenbelt development

Noise emission control technologies

All the diesel generator will be housed in suitable acoustics enclosure so that noise level at a distance of 6 to 7 meter do not exceed 75 dB (A). The diesel generator set LPG Unit will be equipped with walls and ceiling lined with glass wool to acoustically treat the noise levels.

PPEs

Workers will use Ear muffs during their working hours

Diesel Generator Set Emission Control Measures

The most important pollutant requiring control is NOX, as the impact of SO2 emission is minimal because of the use of low (0.05%) sulphur in diesel as fuel. All the DG set would be provided with emission control equipment's. The following mitigation measures are proposed for NOX reduction:

- Add-on emission control technologies;

Exhaust Gas Recirculation (EGR) technology will be used to reduce diesel nitrogen oxide (Nox) emissions. It is one of the principal methods used to reduce nitrogen oxide emissions from diesel engines. EGR technology will be used to reduce diesel nitrogen oxide (Nox) emissions by taking a carefully controlled portion of the inert exhaust gases, cooling it and re-introducing it to the combustion chamber when conditions are right to do so. This reduces the high concentration of Oxygen and the high temperatures in the combustion chamber, both of which are causes of Nox formation.



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Dust Control Plan

Earth moving

For any earth moving, conduct watering as necessary to prevent visible dust emissions from extending 1 km in length in any direction.

- Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface.
- Areas which cannot be stabilized as evidenced by wind driven dust, must have an application of water at least twice per day to at least 80% of unstabilized area.

Distributed surface areas

Apply water to at least 80% of all inactive accessible distributed surface areas on daily basis when there is evidence of wind driven fugitive dust.

Unpaved road

Water all roads used for any vehicular traffic once daily and restrict vehicle speed 25km/h



Health Safety and Environment Plan

The purpose of this field HSE plan to identify the potential impacts and to develop a mechanism for better management of health, safety and environment (HSE) issues to related to the project. The HSE objectives include but are not limited to the following:

- Relevant safety devices like belts, gloves and testers should be strictly used by the Labor at the work site
- Observance construction and safety codes to avoid all possible injuries during construction of the project.
- To ensure all personnel employed on the project are competent to carry out their designated tasks.
- Implement training programs that support the achievement of the unit's staff and personnel's competency in relation to health, safety and environment. Implement a hierarchy of communication forums that ensure that HSE concerns are raised and addressed at all levels of the organization. Introduce methodology of motivating good safety and environmental performance; Continuous monitoring to improve HSE performance HSE orientation sessions before starting work, Wearing of personal protective equipment
- Follow the messages and instructions displayed on HSE notice boards installed in the premises of the unit.
- Beware of emergency assembly points and escapes routes.
- Promptly reporting all accidents to the concerned environmental manager. Do not smoke or produce flame in NO Smoking areas.
- Regular medical check-ups will improve the working condition and efficiency of workers.
- Relevant safety devices like belts, gloves and testers should be strictly used by the operators at the work site.
- Safety of management, workers and visitors must be ensured.
- Observance operational safety codes.



Internal Monitoring Proforma

Sr.	Activity / Parameter	1 month	3 months	6 months	Yes	No
1.	Last clean-up of the drinking water tank?	1 month	3 months	6 months	1 year	Never
2.	Last water quality testing?	1 month	3 months	6 months	1 year	Never
3.	Is the emergency alarm system functioning properly? Any faults?					
4.	Any air borne emissions?					
5.	Any spillage of oils, lubricants, chemicals etc.					
6.	Is septic tank working well? Any overflows?					
7.	Are materials stored squarely?					
8.	Was tree plantation carried out during last plantation season?					
9.	Are diesel, chemicals, and other liquid items stored well and away from water / rain?					
10.	Any littering of floors / premises with solid waste?					
11.	Any smell from the storage compounds?					
12.	Are general parameters being followed?					
13.	Are the mitigation guidelines being followed?					
14.	Any other information? Please describe.					

Name	
Designation	
Signature	
Date	

Terms of Reference (ToR)

The following Terms of Reference (ToRs) were agreed between the project proponent and the environmental consultant for carrying out EIA of the project titled, construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]" at Chak 285/TDA Road, Tehsil and Distt. Layyah.

Being an environmental impact assessment report, the EIA is limited in its extent and scope to the ToRs agreed to between the proponent and the environmental consultant. The EIA was conducted in accordance with international practices and the guidelines, rules, and regulations issued by the Government of Pakistan. The format and mode of environmental impact examination/ assessment shall be kept, to the extent possible, in conformity to the national and international practices in the field of IEE/EIA. The EIAR shall contain examination of the essential baseline conditions, likely or foreseeable disturbances or impacts to the baseline conditions, and the necessary mitigation measures/recommendations in respect of the environmental impacts of the project both during construction and during subsequent functioning. This, of course, will include examination of the potential and actual positive or negative impacts on the physical (tangible) & abstract (non-tangible) environments. The EIA shall cover all aspects of the proposed developmental activity including architectural-, civil-, mechanical-, electrical-works and the spectrum of services concerning its operations as a fat melting and protein recovery plant. The terms of reference (ToR) and scope of the EIA will include, though shall not be limited to the following activities:

- Carrying out a detailed assessment and evaluation of the likely or foreseeable environmental impacts of the project and preparing the Environmental Impact Assessment Report (EIAR) for and on behalf of the project proponent
- Formal submission of the report to the concerned agency for its review in compliance with the mandatory provisions of the rules on the subject
- Reviewing the project activities in context to all pertinent environmental perspectives and examining whether the project is environment friendly or otherwise
- Preparing the EIA Report in the light of the guiding principles, international practices, and the rules set forth in the Pakistan Environmental Protection Agency's Regulations on the subject of IEE/EIA
- Using the best-suited environmental examination and impact assessment methodologies, i.e., those that are most appropriate for the identification, screening and assessment of the possible negative or positive environmental impacts, in line with special nature of the project
- Identifying, investigating, examining, and preparing a comprehensive profile of the foreseeable impacts on the physical, biological, hydrological, economical, and socio-cultural environments likely to emanate from implementation of the project in the area and beyond
- Provision of any other advice and or technical expertise before, during, and after completion of the EIA and even thereafter, if so required by the proponent and covered by the scope of the MoU for the job.

Being an EIA, the report is limited in its extent and scope only to the pertinent environmental parameters as defined in the Environmental Assessment Guidelines of the Government of Pakistan 1997 and the checklist proforma and guidelines of the EPA-Pb. The report shall begin, first by establishing the baseline or the existing environmental profile of the site in particular and the project district in general (wherever and whenever relevant), followed by identification of the adverse or the potentially negative impacts of the project. Besides identification of the potentially adverse or negative impacts, the following shall constitute a few other important aspects of the EIAR:

- Assessment of the spatial, temporal and social dimensions (such as extent, quantum, magnitude and time of occurrence) of the adverse as well as the beneficial impacts
- Assessment of the degree of disturbances to the baseline profile, if any
- Identification of the best-suited measures for mitigating the adverse impacts
- Presenting a workable environmental management plan for ensuring long-term environmental and socioeconomic sustainability of the project

The EIA shall take a stock of the project's potential of consuming the natural resources, particularly the building construction and other input materials required for construction and operation of the plant with reference to the rate of consumption and their sustainable availability in the future. Ascertainment of the extent, quantum and magnitude of the adverse impacts on the existing environmental profile of the area, identification of the best-suited measures for mitigating the identified adverse impacts, and finally the



presentation of a practicable environmental management and monitoring plan for ensuring long-term sustainability of the project also form part of the scope of the EIA. The EIAR shall present a review of consumption of natural resources and the resultant impacts of their consumption on the environment, particularly of the freshwater and energy. The EIAR shall also review the short-term and long-term effects of the groundwater abstraction for various project operations on the environment.

Additionally, the EIA Report to be prepared by the consultant shall comprises the following components:

- Description of the existing environmental settings or the baseline profile of the project's zone of social and environmental influence (the zone of influence has been taken only with respect to the extent of the spatial and temporal impacts of the project)
- Assessment and examination of the social and environmental implications of an adverse land use change emanating from implementation of the project
- Assessment of the most likely disturbances to various environmental parameters emanating from Construction and other related activities to be taken up by the project proponent, if any, following allotment of the land
- ESRMP containing guidelines for the proponent for avoiding and mitigating the predicted adverse impacts on the physical, biological, and socio-cultural environment

CONCLUSION

After carrying out an in-depth and extensive EIA of the probable present and the future impacts (both positive and negative) of the project, construction of "Maryam Fatima Enterprises [Fat Melting & Protein Recovery Unit]" at a vacant site at Chak 285/TDA Road, Tehsil and Distt. Layyah; it is concluded confidently that setting-up of the plant will not cause any adverse impacts on the environmental profile of the area. The setting-up of the plant will rather bring-in healthy and positive improvements in the social, cultural, developmental, agricultural, and employment sectors of the area and the district. As per findings of the EIAR, there will be hardly any noticeable environmental effects from construction of the plant. The whatsoever little impacts, as are likely to come in the wake of setting-up of the plant, can be mitigated by implementing the mitigation measures, as suggested in the instant EIAR.

The EIAR reveals that the impacts of setting-up of the plant on the physical and biological environment will be all negligible and without any bearing on the environmental profile of the site/area. The EIAR further shows that there will not be any exhaustive exploitation of the local natural resources, which will remain conserved and available for sustainable future development. The setting-up of the plant will rather bring-in positive and healthy improvements in the socio-economic environment of the area.

In nutshell, the high-end positive impacts of setting-up of the plant and installation of machinery and pollution control equipment will far outweigh all the low-end negative impacts, thereby making the plant an environmentally sustainable, compatible, feasible and implementable project.



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