MEAT AND POULTRY

1.0 Introduction

Meat and poultry products are one of the most common source of animal protein in Nigeria and the need for its raring and processing can not be over emphasised. Over the years, the sector have grown to be able to meet the demand for its product. This growth has been accompanied by structural changes within the sector, characterized by the emergence and growth of "land-independent" (industrial) farming establishments, and the intensification and concentration of the sectors operations. Pressure to lower production costs and increase supply has led to more efficient operations, made possible through the shift to larger, specialized and more integrated facilities, and through improvements in the use of animal genetics, optimized nutrition and new production technologies.

This improvement in construction and processing pattern have been shown to have some impact on the environment. These impacts are known to arise from the activities involved in the developmental phases and the by-products from its consumption. Therefore, there is need for environmental assessment, especially at the inception of the project development, to identify and predict the potential environmental impacts at every phase of the project development.

This guideline is designed to ensure that all potential environmental issues pertaining to the construction, operation and decommissioning of the project are adequately assessed and addressed. Also, this guideline will assist in sustainable project planning, permitting, and implementation for both project developers and regulators.

2.0 Project Justification

Proponent shall provide necessary and adequate information on the justification of the project in any of the categories above. This shall include a summary of the report of the Project's feasibility study; the need, value and sustainability (social, cultural and economic) of the Project. Such justification shall expressly define the benefits of the Project to its intended end-users and indicate the over-riding advantages or positive impact of the Project over its anticipated environmental impacts. The justification may also include the rationale for selecting the Project amongst various available options or alternatives and any socio-economic factor's justifying the Project.

3.0 Project Description

The following requirements, among others, must be provided for in the project description;

a) Type of project and associated activities to be carried out;

b) The design, size and scale of the food processing project (in terms of raw materials and final products processed on a daily, weekly or monthly basis);

c) The set-up of the building should be in compliance with the existing food laws (NAFDAC Food Act);

d) The workforce – both direct and indirect, permanent or contractual basis;

e) The hours of operation and number of working days per week;

f) The marketing of products (whether products are meant for local market or for exportation) the targeted customer and any proposal for on-site point of sale;

g) A legible Site Layout Plan, drawn to scale 1:200 or as appropriate, indicating the site boundary, any infrastructure on site prior to construction, proposed infrastructures of the new undertaking, entrance/exit, wastewater disposal system, storm water drains, location of chimney, fuel storage, stores, watchman's quarters, parking spaces, delivery bay, entrance and exit amongst others; and

h) Legible detailed Buildings Layout Plans, drawn to scale as appropriate, indicating floor layouts, gross floor area, elevations and architectural plans.

i) Description of main characteristics of operational procedures

j) Numbers of workers during project construction and operation should be accounted

k) Traffic Implications

l) Project time schedule/plan

m) Description of processes involved in terms of:

- Raw materials –its supply, frequency, the mode of transportation and storage;
- Micro-organisms and enzymes– list of micro-organisms to be used as culture and the different enzymes to be used during the different stages of processing. Their origin must be stated;
- Final products –the mode of storage and delivery;
- By-products – the amount of by-products on a daily, weekly or monthly basis, and the mode of disposal;

- Availability of utilities such as water, electricity, and fuel among others; and
- Process technologies – the technology to be used and justification of the choice of technology in case of the availability of alternative technologies.
- A detailed process flowchart should indicate the raw materials input, the intermediate products, the final product and the by-products. The flowchart should also include:
- Flow-rate (either in volume or in mass); and
- Amount of liquid, solid, gaseous and other wastes generated at each stage.
- In case the production involves different process units, a flowchart for each process should be provided along with an overall process flowchart.
- Sources and distribution of equipment, materials needed for the project and its maintenance

4.0 Description of Environment/ Baseline Data

Baseline data of the environment are required to establish the conditions *of* the proposed project site, preceding the actual construction work or development. An overview of the existing environment should be provided in order to place the proposed project in its local and regional context. This baseline studies shall establish the present state of the environment, taking into account changes resulting from natural events and from other human activities. The environmental description shall include; bio-physical component (water, air, soil and biota) and the human socio-economic environment.

4.1 Physical Environment

- Climate and air quality: Rainfall (trend, amount and pattern), wind pattern {speed and direction (presented with a wind rose)}, temperatures, relative humidity, climate zone, air quality measurement (odour, noise, gaseous and particulate pollutants).
- Topography: Drainage pattern, elevation and slopes {this can be presented with a digital elevation model}
- Surface and ground water: physical and chemical quality, seasonal variation, quantity.
- Soil: physical and chemical characteristics

4.2 Biological Environment

- Microbial Ecology: Soil/sediment, water: Total heterotrophic bacteria and fung, Total coliform bacteria, fungi.
- Vegetation: types, species diversity, phytomas, pathological problems, density, rare or significant species or communities, wetlands.
- Wildlife: Checklist, resident and casual, population and density, rare and significant species, significant habitat.

4.3 Socio-Economics (Human Environment)

- Communities likely to be affected: Location, access, population (demographic and social characteristic), economy (employment status, income distribution), housing, concerns, waste management and disposal, energy source/services.
- Land use: existing land use around the project area
- Cultural: Historic sites, archaeological sites, native religious or harvest sites.
- Health: Indigenous population, migrant population, healthcare statistics, disease patterns, disease vectors, health needs, public health/ safety, waste management.

Topography

- Drainage pattern, elevation and slopes which can be presented in digital elevation model, specific landform types etc

Noise

- Identifying sources of noise, Noise due to traffic or transportation of vehicles
- Noise due to heavy equipment operations, Duration and variations in noise over time

Land use

- Land use pattern, actual and projects, specially designated areas, man-made features, incompatible land use attributes (e.g. public water supply, tourism site, , etc.)
- ESAs – sensitivity (distance, area and significance).

5.0 Associated and Potential Environmental Impacts

The project proponent shall state the associated and potential environmental impacts of the proposed meat and poultry processing projects. The study should assess all impacts (positive and negative, significant and non-significant, beneficial and non-beneficial, short and long term) associated with all activities and phases in the project life cycle,

including alternatives.

Common environmental impact associated with the operational phase of meat and poultry processing include:

- Water resources: Significant consumption of water supply, Management of effluent and storm water on site may lead to changes in surface water quality, leaching into aquifers and pollution of downstream environments.
- Land management: Risks of impacting on the integrity of the soil due to irrigation activities, risk of introducing weeds species to the site and the region. Community Health and amenity, risks to health and amenity through odour, noise, light, dust, mosquitoes and vermin; and, risks to traffic safety through increased traffic.
- In addition, risks of disturbance to historical sites, climate change impacts; and solid waste management.

6.0 Mitigation Measures/Alternatives

The project proponent shall state the mitigation measures that shall be taken against identified adverse environmental impacts of the proposed meat and poultry processing project. All the possible preventive, remedial and compensatory measures for each adverse impact shall be determined and recommended. The mitigation measure should be in the format provided in the table below.

Table 1: Associated potential impact and mitigation measures

Impacts	**Typical Mitigation Measures**
Soil	• Construction of drainage ditches, runoff and retention ponds • Usage of appropriate monitoring and control facilities for construction equipment deployed.
Water pollution	• Conjunctive use of ground / surface water, to prevent flooding / waterlogging / depletion of water resources. • Stormwater drainage system to collect surface runoff • All effluents containing acid/alkali/organic/toxic wastes should be properly treated. • Monitoring of ground waters

	• Use of biodegradable, treatable additives, neutralization and sedimentation of wastewaters, where applicable. • Control of sanitary sewage and industrial waste into the environment • Avoid the activities that increases erosion or that contributes nutrients to water (thus stimulating alga growth) • Treated wastewater (such as sewage, industrial wastes, or stored surface runoffs) can be used as cooling water makeup. • Develop spill prevention plans in case of chemical discharges and spills
Air Pollution	• Periodic checking of vehicles and construction machinery to ensure compliance to emission standards • Attenuation of pollution/protection of receptor through green belts/green cover • Regular monitoring of air polluting concentrations • Wetting of roadways to reduce traffic dust and re- entrained particles • Control vehicle seed on sight
Noise Pollution	• Use of suitable muffler systems/enclosures/sound-proof glass panelling on heavy equipment • Proper scheduling of high noise generating activities to minimise noise impacts • Usage of well-maintained construction equipment meeting the regulatory standards and periodic maintenance of equipments Using damping, absorption, dissipation, and deflection methods • Performance specifications for noise represent a way to insure the procured item is controlled
Biological	• Installation of systems to discourage nesting or perching of birds in dangerous environments • Increased employee awareness to sensitive areas

Social	• Health and safety measures for workers • Development of traffic plan that minimizes road use by workers • Upgrade of roads and intersections • Discuss and finalize alternate arrangements and associated infrastructure in places of religious importance • Exploration of alternative approach routes in consultation with local community and other stakeholders • Provision of alternate jobs in unskilled and skilled categories
Construction	• Have a Transport Management Plan in place in order to prevent/minimize the disturbance on surrounding habitats
Solid or Hazardous Wastes	• Proper handling of excavated soil • Proper plan to collect and dispose of the solid waste generated onsite. • Identify an authorized waste handler for segregation of construction and hazardous waste and its removal on a regular basis to minimize odour, pest, litter and garbage impacts • Prohibit burning of refuse onsite.

6.1 Analysis of alternatives

All alternatives in terms of siting and available technologies should be given in the EIA process. Reasons for choosing the present site and technologies proposed must also be given in the EIA report. The no-project alternative should also be considered in circumstances where significant adverse impacts cannot be mitigated. Key considerations here should be ownership, available technologies, and costs. In looking at alternatives, it should also be considered that certain environmental and social impacts are bound to occur in given localities even without the establishment of facility and its consequent activities. Such impacts should be noted while undertaking the EIA.

Other alternatives to be discussed must include, but are not limited to:

- Site selection, including other sites considered and an analysis of local social and economic impacts;

7.0 Environmental Management Plan

Specific safeguards and controls, which are proposed to be employed to minimise or remedy environmental impacts identified in previous sections, are to be included in an Environmental Management Plan (EMP) or similar plan.

Where practicable, the EMP shall include:

- The proposed management structure of the operation and its relationship to the environmental management of the site;
- Management targets and objectives for relevant environmental factors;
- The proposed measures to minimise adverse impacts and maximise opportunities, including environmental protection outcomes;
- Performance indicators by which all anticipated and potential impacts can be measured;
- Proposed monitoring programs to allow early detection of adverse impacts;
- Information on how the land will be managed if it is taken out of production;
- A summary table listing the undertakings and commitments made in the EIA report including clear timelines for key commitments and performance indicators, with cross-references to the text of the EIA report; and
- Provision for the periodic review of the EMP itself.

8.0 Remediation Plans After Decommissioning.

Project proponent shall provide the best remediation plans that will be utilized if the meat and poultry processing facility is to be decommissioned or closed (temporarily or permanently). Both beneficial and adverse environmental effects of the decommissioning or closure shall be scrupulously stated. Mitigation measures shall be proffered for the adverse effects due to decommissioning or closure.

Project proponent shall provide in the EIA report the necessary and appropriate remediation plan that will be taken when the project is decommissioned or temporarily closed for any reason what so ever. The strategy and means of restoring the project area to its original state as much as possible and at the same time ensuring protection of the environment and humans shall be explicitly stated in the EIA report as well as implementation measures proposed.

BREWERY AND BEVERAGE INDUSTRY

1.0 Introduction

In the food industry, the brewing sector holds a strategic economic position with a high annual beer production record. The brewing and beverage industry is one of the largest industrial users of water. In spite of significant technological improvements used in the manufacturing process from acquisition of raw materials to packaging of finished products; energy consumption, water consumption, wastewater, solid waste, by-products and emissions to air remain major environmental challenges.

With this complexity, the need for an environmentally sustainable means of project development is required. The Federal Ministry of Environment developed this guideline to indicate the steps to be followed to carry out an EIA in a brewery and beverage industry. The primary aim of the assessment is to identify the environmental impact of the industry and its mitigating measures.

The food processing projects under this category include the following:

- Beverages (Malt non-alcoholic manufacturing)
- Soft drinks and carbonated water manufacturing
- Beer manufacturing
- Distilleries manufacturing

2.0 Project Justification

Proponents shall provide necessary and adequate information on the justification of the project in any of the categories above. This shall include a summary of the report of the Project's feasibility study; the need, value and sustainability (social, cultural and economic) of the Project. Such justification shall expressly define the benefits of the Project to its intended end-users and indicate the over-riding advantages or positive impact of the Project over its anticipated environmental impacts. The justification may also include the rationale for selecting the Project amongst various available options or alternatives and any socio-economic factor's justifying the Project.

3.0 Project Description

The proposed brewery and beverage manufacturing projects shall describe in details the following:

- Justification for selecting the proposed unit size.
- Land requirement for the project including its break up for various purpose, its availability and optimization.
- Details of proposed layout clearly demarcating various units within the plant.
- Complete process flow diagram describing each unit, its processes and operations, along with material and energy inputs and outputs (material and energy balance).
- Number of working days in the distillery unit.
- Details of proposed source-specific pollution control schemes and equipment to meet the national standards.
- Details on requirement of raw materials, its source and storage at the plant.
- Details on requirement of energy and water along with its source and authorization from the concerned department.
- Details on water balance including quantity of effluent generated, recycled and reused. Efforts to minimize effluent discharge and to maintain quality of receiving water body.
- Details of effluent treatment plant, inlet and treated water quality with specific efficiency of each treatment unit in reduction in respect of all concerned/regulated environmental parameters.
- Details of the proposed methods of water conservation and recharging.
- Detailed plan of spent wash utilization / management.
- Management plan for solid/hazardous waste generation, storage, utilization and disposal including boiler ash utilization and disposal.
- Details regarding infrastructure facilities such as sanitation, fuel storage, restroom, *etc.* to the workers during construction and operation phase.

- In case of expansion of existing industries, remediation measures adopted to restore the environmental quality if the groundwater, soil, crop, air, *etc* are affected and a detailed compliance to the environmental clearance/consent conditions.

- Landuse based on satellite imagery including location specific sensitivities such as national parks or wildlife sanctuary, villages, industries, *etc.* for the study area.

- Demography details of all the villages falling within the study area.

- Topography details of the project area.

- The baseline data to be collected from the study area with different components of the environment in terms of air, noise, water, land, and biology and socio-economic. Actual monitoring of baseline environmental components shall be strictly according to the parameters prescribed in the Terms of Reference ToR after considering the proposed coverage of parameters by the proponent in draft ToR and shall commence after finalization of (ToR) by the competent Authority.

- Geological features and geo-hydrological status of the study area.
- Surface water quality of nearby water sources and other surface drains.
- Details on ground water quality around the plant and compost yard.
- Details on noise levels at sensitive/commercial receptors.
- Site-specific micro-meteorological data including mixing height.
- Ecological status (terrestrial and aquatic) of the study area such as habitat type and quality, species, diversity, rarity, fragmentation, ecological linkage, age, abundance, *etc*.

4.0 Description of the Environment/ Base Line Data

Baseline environmental studies are designed to establish the environmental conditions at a site prior to any site development. Once established, these baseline conditions can provide a benchmark upon which monitoring of any potential future impacts, resulting from the project development, can be evaluated.

However, the baseline study should not be limited to field survey within the proposed site but also should include studies from a systematically delineated area of influence of the proposed project. Area of influence, often called region/zone of influence or

affected environment, is the areas that will be directly or indirectly affected by the phases of the project development. Depending on the magnitude and size of the proposed development, the area of influence shall cover the proposed project site and other areas that might be affected by the project development

Existing data in form of maps, reports, scientific studies, research articles, among others may as well be used to supplement field survey.

5.0 Anticipated and Potential Environmental Impacts

The project proponent shall state the associated and potential environmental impacts of the proposed brewery and beverages project. The potential environmental impacts associated with Food and beverage manufacturing projects (land use and habitat loss, exposing land to erosion, deforestation etc.) vary greatly depending on the technology to be used.

While identifying the likely impacts, also include the following for analysis of significance and required mitigation measures:

- Impacts due to transportation of raw materials and end products on the surrounding environment
- Impacts on surface water, soil and groundwater
- Impacts due to air pollution
- Impacts due to odour pollution
- Impacts due to noise
- Impacts due to fugitive emissions
- Impact on health of workers due to proposed project activities
- Impact on drainage of the area and the surroundings.
- Proposed measures for occupational safety and health of the workers.
- Proposed odour control measures.
- Action plan for the greenbelt development - species, width of plantations, planning schedule etc.

6.0 Mitigation Measures/Alternatives

Mitigation measures that shall be taken against identified adverse environmental impacts of the proposed Brewery and Beverage projects shall be outlined and discussed by the project proponent. All the possible preventive, remedial and compensatory measures for each adverse impact shall be determined and recommended. A table showing the potential impacts of project with corresponding mitigation measures should be provided. The mitigation measure should be in the format provided in the table below.

Table 2: Associated potential impact and mitigation measures

Impacts	**Typical Mitigation Measures**
Soil	• Construction of drainage ditches, runoff and retention ponds • Usage of appropriate monitoring and control facilities for construction equipment deployed.
Water pollution	• Conjunctive use of ground / surface water, to prevent flooding / waterlogging / depletion of water resources. • Stormwater drainage system to collect surface runoff • All effluents containing acid/alkali/organic/toxic wastes should be properly treated. • Monitoring of ground waters • Use of biodegradable, treatable additives, neutralization and sedimentation of wastewaters, where applicable. • Control of sanitary sewage and industrial waste into the environment • Avoid the activities that increases erosion or that contributes nutrients to water (thus stimulating alga growth) • Treated wastewater (such as sewage, industrial wastes, or stored surface runoffs) can be used as cooling water makeup. • Develop spill prevention plans in case of chemical discharges and spills

Air Pollution	• Periodic checking of vehicles and construction machinery to ensure compliance to emission standards • Attenuation of pollution/protection of receptor through green belts/green cover • Regular monitoring of air polluting concentrations • Wetting of roadways to reduce traffic dust and re- entrained particles • Control vehicle seed on sight
Noise Pollution	• Use of suitable muffler systems/enclosures/sound-proof glass panelling on heavy equipment • Proper scheduling of high noise generating activities to minimise noise impacts • Usage of well-maintained construction equipment meeting the regulatory standards and periodic maintenance of equipments Using damping, absorption, dissipation, and deflection methods • Performance specifications for noise represent a way to insure the procured item is controlled
Biological	• Installation of systems to discourage nesting or perching of birds in dangerous environments • Increased employee awareness to sensitive areas
Social	• Health and safety measures for workers • Development of traffic plan that minimizes road use by workers • Upgrade of roads and intersections • Discuss and finalize alternate arrangements and associated infrastructure in places of religious importance • Exploration of alternative approach routes in consultation with local community and other stakeholders • Provision of alternate jobs in unskilled and skilled categories
Construction	• Have a Transport Management Plan in place in order to prevent/minimize the disturbance on surrounding habitats
Solid or	• Proper handling of excavated soil

Hazardous Wastes	• Proper plan to collect and dispose of the solid waste generated onsite. • Identify an authorized waste handler for segregation of construction and hazardous waste and its removal on a regular basis to minimize odour, pest, litter and garbage impacts • Prohibit burning of refuse onsite.

7.0 Environmental Management Plan

- Repetitive, systematic measurement of environmental parameters in effluents wastes and mission.

- Periodic sampling or continuous measurement of environmental parameters to ensure that regulatory requirements are observed and the standard met.

  The project proponent for brewery and beverage production projects shall provide in details the following:

- Monitoring pollutants at receiving environment for the appropriate notified parameters - air quality, groundwater, surface water, *etc.* during operational phase of the project.
- Specific programme to monitor safety and health protection of workers.
- Appropriate monitoring network has to be designed and proposed, to assess the possible residual impacts on VECs.

  Details of in-house monitoring capabilities and the recognized agencies if proposed for conducting monitoring.

  Additional Studies

- Details on risk assessment and damage control during different phases of the project and proposed safeguard measures.
- Details on socio-economic development activities such as commercial property values, generation of jobs, education, social conflicts, cultural status, accidents, *etc.*

- Proposed plan to handle the socio-economic influence on the local community. The plan should include quantitative dimension as far as possible.
- Details on compensation package for the people affected by the project, considering the socio-economic status of the area, homestead oustees, land oustees, and landless labourers.
- Points identified in the public hearing and commitment of the project proponent to the same. Detailed action plan addressing the issues raised, and the details of necessary allocation of funds.

8.0 Remediation Plans After Decommissioning or Closure

- Project proponent shall provide the best remediation plans that will be taken if the renewable energy transmission project is to be decommissioned or closed (temporarily or permanently). Both beneficial and adverse environmental effects of the decommissioning or closure of the transmission project shall be thoroughly stated. Mitigation measures shall be proffered for the adverse effects due to decommissioning or closure. Project proponent shall also design means of restoring the project location back to its original status before the project execution.
- Administrative and technical organizational structure to ensure proposed post-project monitoring programme for approved mitigation measures.
- EMP devised to mitigate the adverse impacts of the project should be provided along with item-wise cost of its implementation (capital and recurring costs).
- Allocation of resources and responsibilities for plan implementation.
- Details of the emergency preparedness plan and on-site and off-site disaster management plan.

FRUIT AND VEGETABLE PROCESSING INDUSTRY

1.0 Introduction

Fruit and vegetables processing are among the most important agricultural based activities. Fruit and vegetable processing projects aim at solving the problems of insufficient demand and supply, weak infrastructure, poor transportation, and perishable nature of the crops. This basic function of this industry is to enable consumers have access to wholesome, safe, and nutritious fruits and vegetables. Fruits and vegetables can be processed in many different ways depending on the type of raw material and the end product. There are two major sub-sectors:

- Fresh packed products, and
- Processed products.

Fruits and vegetables processing generate wastes such as wastewater, fruit pomace, and vegetable stalk which have negative environmental impact on both human health and the environment. This EIA Sectoral Guidelines for Fruit and vegetable Processing are applicable to facilities that extract and process vegetables, fruit juice, and other fruits and vegetable related products such as orange, pineapple, beetroot, mango, banana, grape, salad etc.

2.0 Project Justification

The project proponent shall provide necessary and adequate information on the justification of the project. This shall include a summary of the report of the Project's feasibility study; the need, value and sustainability (social, cultural and economic) of the Project. Such justifications shall expressly define the benefits of the Project to its intended end-users and indicate the over-riding advantages or positive impact of the Project over its anticipated environmental impacts. The justification may also include the rationale for selecting the Project amongst various available options or alternatives and any socio-economic factor's justifying the Project.

3.0 Project Description

Details of litigation pending against the project or proposed site passed by any competent court of law should be stated. The proposed fruit and vegetable processing project shall describe in details the following:

- Justification for selecting the proposed unit size.
- Land requirement for the project including its break up for various purposes, its availability and optimization.
- Complete process flow diagram describing each unit, its processes and operations in production of sugar, plant layout including floor plan, machine and drainage lay-out, water and energy consumption
- Details on requirement of raw materials, its source and storage at the plant.
- List of all machines and equipment to be used including sources of air emissions and the provided control facilities (with details, plans, specifications, manual of operation, catalogue or photographs)
- Details on requirement of energy and water, along with its source and authorization from the concerned department.
- Water Balance (showing water consumption / volume of domestic, process/production, cooling, and other sources)
- Details on wastewater generation (identify all sources, quantity, quality, onsite collection, treatment and disposal). Provide analysis reports; details and plans of any proposed collection/holding tanks and wastewater treatment facilities as shown in drainage lay-out
- Details of effluent treatment plant, inlet and treated water quality with specific efficiency of each treatment unit in reduction in respect of all concerned/regulated environmental parameters.
- Number of working days of the fruit juice production unit.
- Details of the use of steam from the boiler.

Furthermore, information on the following shall be provided:

- Fruit and vegetable oilseed sourcing, transportation and storage (issues of traffic congestion)
- Water sourcing and use for fruit and vegetable plantation at the initial stage of cultivation
- Land use pattern and cropping, if the fruit and vegetable plantations are owned by the fruit processing industry.
- Fruit and vegetable quantity generated, its storage, internal use and external disposal
- Use of Pith

- Fruit and vegetable refrigeration
- Use of fossil fuels
- Fire hazards
- Details of the proposed methods of water conservation and recharging.
- Details of proposed source-specific pollution control schemes and equipment to meet the national standards.
- Identify all sources of solid and hazardous wastes, volume, onsite collection and disposal. (If generated wastes are for recycling - provide all the details including company name, contact person/number and Clearance/permits of the waste scrap/collection companies).
- Management plan for solid/hazardous waste generation, storage, utilization and disposal.
- Details regarding infrastructure facilities such as sanitation, fuel storage, restroom, *etc*. to the workers during construction and operation phase.
- In case of expansion of existing industries, remediation measures adopted to restore the environmental quality if the groundwater, soil, crop, air, etc., are affected and a detailed compliance to the prior environmental clearance/consent conditions.
- Any litigation pending against the project and /or any direction /order passed by any Court of Law related to the environmental pollution and impacts in the last two years, if so, details thereof
- List of dangerous goods with details and plans of storage area/facilities including bund walls
- Manpower requirements and expected plant operation
- Capital or Project Cost
- Project Status, Duration of the Project and Scheduling of activities

4.0 Description of the Environment/Baseline Data

The proponent shall provide in details:

- the study extent, which shall cover the entirety of the proposed project site and areas that are likely to be affected by the phases of the project development.
- Project location and nearby settlements/communities with distances from the project site.
- Land use land cover map indicating the proposed project site, land mark features and

other relevant information within the study area

- Demography details of all the villages within proposed industrial site should be obtained.
- Topography details (terrain types, landforms, etc.) of the project area should be obtained.
- The baseline data to be collected from the study area shall include w.r.t. different components of the environment viz. air, noise, water, land, and biology and socio-economic. Actual monitoring of baseline environmental components shall be strictly according to the parameters prescribed in the ToR after considering the proposed coverage of parameters by the proponent in draft ToR and shall commence after finalization of ToR by the competent Authority.
- Geological features and geo-hydrological status of the study area shall be studied.
- Study of Surface water quality of nearby water sources and other surface drains shall be conducted.
- Details on ground and surface water quality shall also be provided.
- Details on ambient air quality
- The air quality contours may be plotted on a location map showing the location of project site, habitation nearby, sensitive receptors, if any and wind roses.
- Details on noise levels at sensitive/commercial receptors shall be monitored.
- Site-specific micro-meteorological data including mixing height shall be checked.
- Ecological status (terrestrial and aquatic) of the study area such as habitat type and quality, species, diversity, rarity, fragmentation, ecological linkage, age, abundance, etc shall be obtained.

5.0 Associated and Potential Environmental Impacts

The project proponent shall state the associated and potential environmental impacts of the proposed fruit and vegetable project. The potential environmental impacts associated with fruits and vegetable processing projects such as land use and habitat loss, exposing land to erosion, deforestation etc. vary greatly depending on the technology and mode of operation. While identifying the likely impacts, the following shall also be included for analysis of significance and required mitigation measures:

- impacts due to transportation of raw materials and end products on the surrounding environment

- Impacts on surface water, soil and groundwater
- Impacts due to air pollution
- Impacts due to odour pollution
- Impacts due to noise
- Impacts due to fugitive emissions
- Impact on health of workers due to proposed project activities and exposure
- Impact on drainage of the area and the surroundings.
- Proposed measures for occupational safety and health of the workers.
- Proposed odour control measures.
- Action plan for the greenbelt development - species, width of plantations, planning schedule etc.

6.0 Mitigation Measures/Alternatives

Mitigation measures that shall be taken against identified adverse environmental impacts of the proposed fruit and vegetable processing projects shall be outlined and discussed by the project proponent. All the possible preventive, remedial and compensatory measures for each adverse impact shall be determined and recommended. A table showing the potential impacts of project with corresponding mitigation measures should be provided. The mitigation measure should be in the format provided in the table below.

Table 3 Associated potential impact and mitigation measures

Impacts	**Typical Mitigation Measures**
Soil	• Construction of drainage ditches, runoff and retention ponds • Usage of appropriate monitoring and control facilities for construction equipment deployed.
Water pollution	• Conjunctive use of ground / surface water, to prevent flooding / waterlogging / depletion of water resources. • Stormwater drainage system to collect surface runoff • All effluents containing acid/alkali/organic/toxic wastes should be properly treated. • Monitoring of ground waters

	• Use of biodegradable, treatable additives, neutralization and sedimentation of wastewaters, where applicable. • Control of sanitary sewage and industrial waste into the environment • Avoid the activities that increases erosion or that contributes nutrients to water (thus stimulating alga growth) • Treated wastewater (such as sewage, industrial wastes, or stored surface runoffs) can be used as cooling water makeup. • Develop spill prevention plans in case of chemical discharges and spills
Air Pollution	• Periodic checking of vehicles and construction machinery to ensure compliance to emission standards • Attenuation of pollution/protection of receptor through green belts/green cover • Regular monitoring of air polluting concentrations • Wetting of roadways to reduce traffic dust and re- entrained particles • Control vehicle seed on sight
Noise Pollution	• Use of suitable muffler systems/enclosures/sound-proof glass panelling on heavy equipment • Proper scheduling of high noise generating activities to minimise noise impacts • Usage of well-maintained construction equipment meeting the regulatory standards and periodic maintenance of equipments Using damping, absorption, dissipation, and deflection methods • Performance specifications for noise represent a way to insure the procured item is controlled
Biological	• Installation of systems to discourage nesting or perching of birds in dangerous environments • Increased employee awareness to sensitive areas
Social	• Health and safety measures for workers • Development of traffic plan that minimizes road use by workers

	• Upgrade of roads and intersections • Discuss and finalize alternate arrangements and associated infrastructure in places of religious importance • Exploration of alternative approach routes in consultation with local community and other stakeholders • Provision of alternate jobs in unskilled and skilled categories
Construction	• Have a Transport Management Plan in place in order to prevent/minimize the disturbance on surrounding habitats
Solid or Hazardous Wastes	• Proper handling of excavated soil • Proper plan to collect and dispose of the solid waste generated onsite. • Identify an authorized waste handler for segregation of construction and hazardous waste and its removal on a regular basis to minimize odour, pest, litter and garbage impacts • Prohibit burning of refuse onsite.

7.0 Environmental Management Plans

Fruit and vegetable processing project developer or proponent shall provide a qualitative and quantitative plan on the environmental monitoring scheme. This scheme shall discuss the scope of monitoring process, how the monitoring program shall be carried out, how often test shall be carried out to monitor the effects of pollutants (either solid, liquid or gaseous) and other factors on the environment, and the parameters to be monitored. This should also include the following:

- Administrative and technical organizational structure to ensure proposed post-project monitoring programme for approved mitigation measures.
- EMP devised to mitigate the adverse impacts of the project should be provided along with item-wise cost of its implementation (capital and recurring costs).
- Allocation of resources and responsibilities for plan implementation.
- Details of the emergency preparedness plan and on-site and off-site disaster management plan.

7.1 Environmental Monitoring Program

The project proponent for fruit and vegetable processing projects shall provide in details the following:

- Monitoring programme for pollution control at source.
- Monitoring pollutants at receiving environment for the appropriate notified parameters - air quality, groundwater, surface water, *etc.* during operational phase of the project.
- Specific programme to monitor safety and health protection of workers.
- Appropriate monitoring network has to be designed and proposed, to assess the possible residual impacts on VECs.
- Details of in-house monitoring capabilities and the recognized agencies if proposed for conducting monitoring.

Additional studies shall include:

- Details on risk assessment and damage control during different phases of the project and proposed safeguard measures.
- Details on socio-economic development activities such as commercial property values, generation of jobs, education, social conflicts, cultural status, accidents, etc.
- Proposed plan to handle the socio-economic influence on the local community. The plan should include quantitative dimension as far as possible.
- Points identified in the public hearing and commitment of the project proponent to the same. Detailed action plan addressing the issues raised, and the details of necessary allocation of funds.
- Detailed compensation package for the people affected by the project shall be prepared, considering the socio-economic status of the area, homestead oustees, land oustees, and landless labourers.

8.0 Remediation Plans After Decommissioning or Closure

Project proponent shall provide the best remediation plans that shall be taken if the renewable energy transmission project is to be decommissioned or closed (temporarily or permanently). Both beneficial and adverse environmental effects of the decommissioning or closure of the transmission project shall be thoroughly stated. Mitigation measures shall be proffered for the adverse effects due to decommissioning or closure. Project proponent shall also design means of restoring the project location back to its original status before the project execution.

GRAIN MILLING AND PASTA PRODUCTION

1.0 Introduction

Prior to industrial revolution, pasta products were made by hand in small shops. Today most pasta is manufactured by continuous, high capacity extruder, which operate on the auger extrusion principle in which kneading and extrusion are performed in a single operation. Most by-products are dry and environmentally benign. The milling and processing of grains into pasta products leads to so many environmental issues hence, the need for this sectoral guideline on EIA for grain milling.

2.0 Project Justification

The project proponent shall provide necessary and adequate information on the justification of the project. This shall include a summary of the report of the Project's feasibility study; the need, value and sustainability (social, cultural and economic) of the Project. Such justification shall expressly define the benefits of the Project to its intended end-users and indicate the over-riding advantages or positive impact of the Project over its anticipated environmental impacts. The justification may also include the rationale for selecting the Project amongst various available options or alternatives and any socio-economic factor's justifying the Project.

3.0 Project Description

Details of litigation pending against the project or proposed site passed by any competent court of law should be stated. The following should be stated in a project description:

- Type of the Project

1. A description on the type of project such as manufacturing or services
2. Location and site plan showing all buildings, drains, discharge points to air, water, or land and storage areas for dangerous goods. The map must clearly show the adjacent land uses within 2 km. radius.
3. Size or magnitude of the operation, including any associated activities required by the project, drawings showing project layout, components of the projects, etc.
4. Size and location of storage silos for grain and semolina storage.

5. Detail methods of aeration of grains in the silos
6. Description of Project Phases (Pre-Construction, Construction, Operation, and Abandonment Phases)
7. For projects involving manufacturing or processing: Description of manufacturing processes for all activities being applied for license, process flowchart, types and quantities of raw materials, production capacity, energy and water requirement, material balance diagram
8. List of all production machineries or equipment and the provided air emission control facilities (with details, plans, specifications, catalogues and photographs if there are any; floor plan, machinery and drainage lay-out)

- Description of Waste streams (where applicable) pertaining to:
- Air Emissions and Noise

1. Type of fuel and rate of use in all fuel-burning installations
2. Description of all air emission source equipment and the provided air pollution control facilities
3. Rate and type of air pollutant emissions (e.g. PM10, TSP, SO2, NOx)
4. The height and diameter of chimneys to be provided
5. Discharge velocity of flue gases from chimney
6. Details of the operation and maintenance of proposed air pollution control devices

- Water and Wastewater Discharges

1. Type of wastewater generated (domestic, process or trade wastewater), its quality (for process wastewater) and estimated volume of discharge.
2. For process wastewater: Description of onsite collection / disposal, provision for a wastewater treatment facility; and other options rather than disposal
3. Design, plans and details (including Operation and maintenance) of any proposed wastewater treatment facility
4. For domestic wastewater: Onsite collection and disposal and/or if a centralized,
5. Sewage Treatment Plant (STP) is provided in the plant site
6. Solid Wastes

7. Identify all sources of solid wastes generated (domestic, general and hazardous)
8. Quantity / Volume and on-site collection and disposal

   (Where generated wastes are for recycling - provide all the Details including company name, contact person / number and Clearance/Permits of the waste scrap / collecting companies)

- Dangerous Goods

1. Tabulated list of dangerous goods and the rate of use
2. Description of storage
3. Details of storage tanks, bund walls, etc.
4. Manpower requirements
5. Description of manpower requirements during construction and operation phases (administrative and production)
6. Plant Operation
7. State the proposed plant operation (number of hours/day, days/week, shifts/day)
8. Project Capital Cost (to be the basis for Clearance processing fee at 0.1% of the Capital Cost)

4.0 Description of the Environment/Baseline Data

Baseline data of the environment are required to establish the conditions of the proposed project site, preceding the actual construction work or development. An overview of the existing environment should be provided in order to place the proposed project in its local and regional context. This baseline studies shall establish the present state of the environment, taking into account changes resulting from natural events and from other human activities.

The environmental description shall include; bio-physical component (water, air, soil and biota) and the human socio-economic environment.

Facets of the environment to be considered in relation to grain mill and pasta production shall include, the bio-physical, and socio-economic factors.

Bio-physical environment

The following parameters of the bio-physical environment shall be observed.

a. Climate and air quality: rainfall (trend, amount and pattern), wind pattern speed and direction, temperature, relative humidity, climate zone, air quality measurement (odour, noise, gaseous and particulate pollutants).
b. Topography: Drainage pattern, elevation and slopes
c. Surface and ground water: Pphysical and chemical quality, microbial characteristics, seasonal and temporal variations.
d. Soil: Pphysical, chemical and microbiological characteristics, soil engineering test.
e. Vegetation: types, species diversity, pathological problems, density, and rare species
f. Wildlife: population density, terrestrial and aquatic systems, rare species, and significant habitat.

Socio-Economic Factor

The human environment shall consider the following socio-economic factors.

i. Residents affected: Location, access, demographic and social characteristic such as population distribution, Average household size, sex ratio, social structure and literacy levels, economy activity (employment status, income distribution), housing, concerns, health status.
ii. Waste management: generation, storage, transportation, disposal, and recycling, energy source/services.
iii. Land use: existing land use around the project area
iv. Biotic: living components (flora and fauna characteristics)
v. Cultural: Historic sites, archaeological sites, native religious or harvest sites.
vi. Health: Indigenous population, migrant population, healthcare statistics, disease patterns, disease vectors, health needs, public health/ safety, waste management.

5.0 Mitigation Measures/Alternatives

The project proponent shall state the mitigation measures that shall be taken against identified adverse environmental impacts of the proposed meat and poultry processing project. All the possible preventive, remedial and compensatory measures for each adverse impact shall be determined and recommended. The mitigation measure should be in the format provided in the table below.

Table 4 Associated potential impact and mitigation measures

Impacts	**Typical Mitigation Measures**
Soil	• Construction of drainage ditches, runoff and retention ponds • Usage of appropriate monitoring and control facilities for construction equipment deployed.
Water pollution	• Conjunctive use of ground / surface water, to prevent flooding / waterlogging / depletion of water resources. • Stormwater drainage system to collect surface runoff • All effluents containing acid/alkali/organic/toxic wastes should be properly treated. • Monitoring of ground waters • Use of biodegradable, treatable additives, neutralization and sedimentation of wastewaters, where applicable. • Control of sanitary sewage and industrial waste into the environment • Avoid the activities that increases erosion or that contributes nutrients to water (thus stimulating alga growth) • Treated wastewater (such as sewage, industrial wastes, or stored surface runoffs) can be used as cooling water makeup. • Develop spill prevention plans in case of chemical discharges and spills
Air Pollution	• Periodic checking of vehicles and construction machinery to ensure compliance to emission standards • Attenuation of pollution/protection of receptor through green

	belts/green cover • Regular monitoring of air polluting concentrations • Wetting of roadways to reduce traffic dust and re- entrained particles • Control vehicle seed on sight
Noise Pollution	• Use of suitable muffler systems/enclosures/sound-proof glass panelling on heavy equipment • Proper scheduling of high noise generating activities to minimise noise impacts • Usage of well-maintained construction equipment meeting the regulatory standards and periodic maintenance of equipments Using damping, absorption, dissipation, and deflection methods • Performance specifications for noise represent a way to insure the procured item is controlled
Biological	• Installation of systems to discourage nesting or perching of birds in dangerous environments • Increased employee awareness to sensitive areas
Social	• Health and safety measures for workers • Development of traffic plan that minimizes road use by workers • Upgrade of roads and intersections • Discuss and finalize alternate arrangements and associated infrastructure in places of religious importance • Exploration of alternative approach routes in consultation with local community and other stakeholders • Provision of alternate jobs in unskilled and skilled categories
Construction	• Have a Transport Management Plan in place in order to prevent/minimize the disturbance on surrounding habitats
Solid or Hazardous Wastes	• Proper handling of excavated soil • Proper plan to collect and dispose of the solid waste generated onsite.

	• Identify an authorized waste handler for segregation of construction and hazardous waste and its removal on a regular basis to minimize odour, pest, litter and garbage impacts • Prohibit burning of refuse onsite.

5.1 Analysis of alternatives

All alternatives in terms of siting and available technologies should be given in the EIA process. Reasons for choosing the present site and technologies proposed must also be given in the EIA report. The no-project alternative should also be considered in circumstances where significant adverse impacts cannot be mitigated. Key considerations here should be ownership, available technologies, and costs. In looking at alternatives, it should also be considered that certain environmental and social impacts are bound to occur in given localities even without the establishment of facility and its consequent activities. Such impacts should be noted while undertaking the EIA.

Other alternatives to be discussed must include, but are not limited to:

Not proceeding with the proposal;

- Site selection, including other sites considered and an analysis of local social and economic impacts;
- Alternative water management practices to decrease demands on drinking water; and
- Environmental management techniques.

6.0 Environmental Management Plan

The project proponent shall clearly establish and submit information on the environmental monitoring plans. The EMP shall assign responsibilities for action and provides time frame within which plan mitigation measures can be done.

These EMP shall cover the following:

- Management of construction impacts (e.g. landscape management plants).

- Management of operational impacts (e.g. buildings, infrastructure, transport and parking management maintenance and site security plans, emergency and contingency plans).
- Strategies and action plans to feed information from monitoring into management practices.
- Public awareness and training programs for operation staff.
- Indicators of compliance with licensing and approval requirements.
- Performance indicators in relation to critical operational issues including:
- Waste management performance indicators in relation to recycling and reuse Packers on the manual line
- Monitoring of received complaints.
- Monitoring procedures plan (schedule/frequency)
- Internal reporting and links to management practices and action plans
- Reporting to relevant authorities and, if appropriate, to the consent authority or the community.

7.0 Remediation plan after decommissioning

Project proponent shall provide the necessary remediation plan that is required to be undertaken once all activities of the have ceased. The necessary objectives, mitigation measures, allocation of responsibilities, time frames and costs pertaining to prevention, restoration of development area back to its original status, minimization and monitoring of all potential impacts associated with the decommissioning and closure phase of the Housing and settlement project.

SUGAR MANUFACTURING

1.0 Introduction

Sucrose (α-D-glucopyranosyl-(1 → 2)-β-D-fructofuranose) is ubiquitously known as common table sugar, and crystalline sucrose is primarily produced industrially from sugarcane (Saccharum officinarum) and sugar beet (Beta vulgaris). Like many other food and chemical industries, the sugar industry and related sugar-bioproduct processing activity is of concern because of their impact on the environment.

The processing of sugar produces environmental impacts through intensive use of water, discharge and runoff of polluted effluent, air pollution, disturbance from heavy use of equipment, and poses a threat to bio-physical component of the environment.

This guideline is designed to ensure that all potential issues concerning the construction, operation and closure of a sugar industry facility are well managed through assessment, quality management and provisions of measures for environmental and social issues associated with sugar processing and refining.

2.0 Project Justification

The project proponent shall provide necessary and adequate information on the justification of the project. This shall include a summary of the report of the Project's feasibility study; the need, value and sustainability (social, cultural and economic) of the Project. Such justification shall expressly define the benefits of the Project to its intended end-users and indicate the over-riding advantages or positive impact of the Project over its anticipated environmental impacts. The justification may also include the rationale for selecting the Project amongst various available options or alternatives and any socio-economic factor's justifying the Project.

3.0 Project Description

Details of litigation pending against the project or proposed site passed by any competent court of law should be stated. The proposed sugar manufacturing projects shall describe in details the following:

- Justification for selecting the proposed unit size.
- Land requirement for the project including its break up for various purposes, its availability and optimization.

- Complete process flow diagram describing each unit, its processes and operations in production of sugar, along with material and energy inputs and outputs (material and energy balance).
- Details on requirement of raw materials, its source and storage at the plant.
- Details on requirement of energy and water along with its source and authorization from the concerned department.
- Details on water balance including quantity of effluent generated, recycled and reused. Efforts to minimize effluent discharge and to maintain quality of receiving water body.
- Details of effluent treatment plant, inlet and treated water quality with specific efficiency of each treatment unit in reduction in respect of all concerned/regulated environmental parameters.
- Number of working days of the sugar production unit.
- Details of the use of steam from the boiler.
- Information on Sugar cane sourcing, transportation and storage (issues of traffic congestion)
- Water sourcing and use for sugarcane plantation
- Land use pattern and cropping, if sugarcane plantations are owned by the mill
- Bagasse quantity generated, its storage, internal use and external disposal
- Details of the proposed methods of water conservation and recharging.
- Details of proposed source-specific pollution control schemes and equipments to meet the national standards.
- Management plan for solid/hazardous waste generation, storage, utilization and disposal.
- Details regarding infrastructure facilities such as sanitation, fuel storage, restroom, *etc.* to the workers during construction and operation phase.
- In case of expansion of existing industries, remediation measures adopted to restore the

environmental quality if the groundwater, soil, crop, air, etc., are affected and a detailed compliance to the prior environmental clearance/consent conditions.

4.0 Description of the Environment

Detailed description of the existing environment (biophysical and human environment) in which the proposed sugar industry is to be sited. The methods and investigations undertaken for this purpose should be disclosed and be appropriate to the size and magnitude of the project. The description shall include, project location, topography, climatic conditions and the ecological characteristics of the project area.

- Air quality: gaseous pollutant, emissions and particulates
- Biological environment: flora and fauna type, distribution, density, socio-cultural value, economic significance, rareness and abundance of species, recreational/parks values.
- Soil quality: Contamination level, microbial characteristics, moisture content, cation exchange capacity, structural test.
- Water: water Quality and pollution level, availability of water, source of effluent and wastewater discharge.
- Noise: noise disturbance (equipment facilities and transportation)
- Landuse: Land use pattern, landscape, land features, drainage pattern, slope/ topography and landform specifications.
- Climate: Characteristics: Temperature, relative humidity, seasonal rainfall pattern
- Socio-economics: Demography information of project affected areas, economy (employment rate, income distribution, housing, education, and cultural value
- Waste management: generation, storage, transportation, disposal, and recycling, energy source/service

5.0 Anticipated and Potential Environmental Impact

The project proponent shall state the associated and potential environmental impacts of the proposed sugar manufacturing project. The potential environmental impacts associated with Food and beverage manufacturing projects (land use and habitat loss, exposing land to erosion, deforestation etc.) vary greatly depending on the technology to be used. Analysis of significance and required mitigation measures shall include;

a. Impacts due to transportation of raw materials and end products on the surrounding environment

b. Impacts on surface water, soil and groundwater

c. Impacts due to air pollution

d. Impacts due to odour pollution

e. Impacts due to noise

f. Impacts due to fugitive emission

g. Impact on health of workers due to proposed project activities

h. Impact on drainage of the area and the surroundings.

i. Proposed measures for occupational safety and health of the workers.

j. Proposed odour control measures.

k. Action plan for the greenbelt development - species, width of plantations, planning schedule etc.

6.0 Mitigation Measures/Alternatives

Mitigation measures that shall be taken against identified adverse environmental impacts of the proposed Brewery and Beverage projects shall be outlined and discussed by the project proponent. All the possible preventive, remedial and compensatory measures for each adverse impact shall be determined and recommended. A well detailed format showing the potential impacts of project with corresponding mitigation measures should be provided.

Impacts	**Typical Mitigation Measures**
Soil	• Installation of drainage ditches • Runoff and retention ponds • Usage of appropriate monitoring and control facilities for construction equipment deployed • Methods to reuse earth material generated during

	excavation
Resources– fuel/construction materials, etc.	• Availing the resources which could be replenished by natural systems, • etc.
Deforestation	• Plant or create similar areas • Initiate a tree planning program in other areas
Water pollution	• Conjunctive use of to prevent flooding / waterlogging / depletion of water resources. • Stormwater drainage system to collect surface runoff • Minimize flow variation from the mean flow • Storing of oil wastes in lagoons should be minimized in order to avoid possible contamination of the ground water system. • All effluents containing acid/alkali/organic/toxic, oil wastes should be properly treated before final discharge into environment. • Monitoring of ground waters • Dewatering of sludge and appropriate disposal of solids • By controlling discharge of sanitary sewage and industrial waste into the environment • By avoiding the activities that increases erosion or that contributes nutrients to water (thus stimulating alga growth) • All surface runoffs around mines or quarries should be collected treated and disposed. • Treated wastewater can be used as cooling water makeup. • Develop spill prevention plans in case of chemical discharges and spills
Air Pollution	• Periodic checking of vehicles and construction machinery to ensure compliance to emission standards

	• Attenuation of pollution/protection of receptor through green belts/green cover • Regular monitoring of air polluting concentrations • Wetting of roadways to reduce traffic dust and re-entrained particles • Control vehicle speed on sight • Maintaining dust levels within permissible limits • Provision for masks when dust level exceeds
Noise Pollution	• Use of suitable muffler systems/enclosures/sound-proof glass paneling on heavy equipment/pumps/blowers • Pumps and blowers may be mounted on rubber pads or any other noise absorbing materials • Limiting certain activities • Proper scheduling of high noise generating activities to minimise noise impacts • Usage of well-maintained construction equipment meeting the regulatory standards • Periodic maintenance of equipments/replacing whenever necessary/lubrication of rotating parts, etc. • By using damping, absorption, dissipation, and deflection methods • By using common techniques such as constructing sound enclosures, applying mufflers, mounting noise sources on isolators, and/or using materials with damping properties • Performance specifications for noise represent a way to insure the procured item is controlled
Biological	• Increased employee awareness to sensitive areas
Social	• Upgrade of roads and intersections • Provide sufficient counseling and time to the affected population for relocation

	• Discuss and finalize alternate arrangements and associated infrastructure in places of religious importance • Exploration of alternative approach routes in consultation with local community and other stakeholders • Provision of alternate jobs in unskilled and skilled categories
Occupational Health and Safety	• Provision of worker camps with proper sanitation and medical facilities, as well as making the worker camps self-sufficient with resources like water supply, power supply, etc • Arrangement of periodic health check-ups for early detection and control of communicable diseases. • Arrangement to dispose off the wastes at approved disposal sites. • Provide preventive measures for potential fire hazards with requisite fire detection, fire-fighting facilities and adequate water storage
Construction	• Have a Transport Management Plan in place in order to prevent/minimize the disturbance on surrounding habitats
Solid / Hazardous Wastes	• Proper handling of excavated soil • Proper plan to collect and dispose off the solid waste generated onsite. • Identify an authorized waste handler for segregation of construction and hazardous waste and its removal on a regular basis to minimize odour, pest and litter impacts • Prohibit burning of refuse onsite.
	•

7.0 Environmental Management Plan

Sugar manufacturing project developer or proponent shall provide a qualitative and quantitative plan on the environmental monitoring scheme. This scheme shall discuss the scope of monitoring process, how the monitoring program shall be carried out, how often test shall be carried out to monitor the effects of pollutants (either solid, liquid or gaseous) and other factors on the environment, and the parameters to be monitored. This should also include the following:

a. Administrative and technical organizational structure to ensure proposed post-project monitoring programme for approved mitigation measures.

b. EMP devised to mitigate the adverse impacts of the project should be provided along with item-wise cost of its implementation (capital and recurring costs).

c. Allocation of resources and responsibilities for plan implementation.

d. Details of the emergency preparedness plan and on-site and off-site disaster management plan.

7.1 Environmental monitoring program

The project proponent for sugar production projects shall provide in details the following:

a) Monitoring programme for pollution control at source.

b) Specific programme to monitor safety and health protection of workers.

c) Appropriate monitoring network has to be designed and proposed, to assess the possible residual impacts on VECs.

d) Details of in-house monitoring capabilities and the recognized agencies if proposed for conducting monitoring.

e) Proposed plan to handle the socio-economic influence on the local community. The plan should include quantitative dimension as far as possible.

f) Details on compensation package for the people affected by the project, considering the socio-economic status of the area, homestead oustees, land oustees, and landless

labourers.

8.0 Remediation Plans After Decommissioning or Closure

Project proponent shall provide the best remediation plans that will be taken if the sugar production industry project is to be decommissioned or closed (temporarily or permanently). Both beneficial and adverse environmental effects of the decommissioning or closure of the transmission project shall be thoroughly stated. Mitigation measures shall be proffered for the adverse effects due to decommissioning or closure. Project proponent shall also design means of restoring the project location back to its original status before the project execution.

VEGETABLE OIL PRODUCTION AND PROCESSING

1.0 Introduction

Vegetable oils and fats are important ingredient in a vast number of products. They are used in food applications, animal feed, cosmetics, detergents, paints, plastics, candles, pharmaceuticals, biofuels and many other technical applications. Recently, there have been an increase in demand for these products which have resulted in increased need for natural resources. The increase in demand of these product have necessitated the need for concern over environmental sustainability as the various phases involved in its development have varying impact on the environment. Therefore, there is need for environmental impact assessment to assesses the potential environmental impact of a project and to know how such impacts can be mitigated.

However, this EIA Guidelines for Vegetable Oil Production and Processing are applicable to stakeholders and other proponents involved in vegetable oil projects which include the extraction and processing of oils and fats from a variety of seeds, grains, and nuts; these include canola, castor, cottonseed, mustard, olive, palm, palm-kernel, peanut (groundnut), rapeseed, safflower, sesame, soybean, and sunflower.

2.0 Project Justification

The project proponent shall provide necessary and adequate information on the justification of the project. This shall include a summary of the report of the Project's feasibility study; the need, value and sustainability (social, cultural and economic) of the Project. Such justification shall expressly define the benefits of the Project to its intended end-users and indicate the over-riding advantages or positive impact of the Project over its anticipated environmental impacts. The justification may also include the rationale for selecting the Project amongst various available options or alternatives and any socio-economic factor's justifying the Project.

3.0 Project Description

Details of litigation pending against the project or proposed site passed by any competent court of law should be stated. The proposed vegetable oil projects shall describe in details the vegetable oil production, infrastructural facilities and utilities demand, associated waste, management plan.

The EIA written report shall give a description of the project development in relation to the project requirement and environment.

a. Justification for selecting the proposed unit size.

b. Land requirement for the project including its break up for various purposes, its availability and optimization.

c. Complete process flow diagram describing each unit, its processes and operations in production of sugar, plant layout including floor plan, machine and drainage lay-out, water and energy consumption

d. Details on requirement of raw materials, its source and storage at the plant.

e. List of all machines and equipment to be used including sources of air emissions and the provided control facilities (with details, plans, specifications, manual of operation, catalogue or photographs)

f. Details on requirement of energy and water along with its source and authorization from the concerned department.

g. Water Balance (showing water consumption/volume of domestic, process/production, cooling, and other sources)

h. Details on wastewater generation (identify all sources, quantity, quality, onsite collection, treatment and disposal). Provide analysis reports; details and plans of any proposed collection/holding tanks and wastewater treatment facilities as shown in drainage lay-out

i. Details of effluent treatment plant, inlet and treated water quality with specific efficiency of each treatment unit in reduction in respect of all concerned/regulated

environmental parameters.

j. Number of working days of the vegetable oil production unit.

k. Details of the use of steam from the boiler.

l. Information on Palm kernel and vegetable oilseed sourcing, transportation and storage (issues of traffic congestion)

m. Water sourcing and use for oilseed plantation at the initial stage of cultivation

n. Land use pattern and cropping, if oilseeds plantations are owned by the oilseed refinery.

o. Identify all sources of solid and hazardous wastes, volume, onsite collection and disposal. (If generated wastes are for recycling - provide all the details including company name, contact person/number and Clearance/permits of the waste scrap/collection companies)

p. Details regarding infrastructure facilities such as sanitation, fuel storage, restroom, *etc.* to the workers during construction and operation phase.

q. In case of expansion of existing industries, remediation measures adopted to restore the environmental quality if the groundwater, soil, crop, air, etc., are affected and a detailed compliance to the prior environmental clearance/consent conditions.

r. Any litigation pending against the project and /or any direction /order passed by any Court of Law related to the environmental pollution and impacts in the last two years, if so, details thereof

s. List of dangerous goods with details and plans of storage area/facilities including bund walls

t. Manpower requirements and expected plant operation for the vegetable oilseed production

u. Capital or Project Cost

v. Project Status, Duration of the Project and Scheduling of activities

Emphasis should however be given to those components with the most potential for significant short and long term environmental impacts.

4.0 Description of the Environment

An overview of the existing environment should be provided. The baseline description of the proposed project shall detailed indirect and direct impact on various facets of environment. The project proponent shall describe in details of the following:

a) A clear delineation of the EIA study area within which impacts must be considered. The study area shall include all valued environmental resources that might be significantly affected by the project.

b) Environmental components that will be significantly affected by the project, hence not necessarily gathering information on all of the components listed hereunder.

- Water (water quality, physicochemical, microbial parameter, freshwater sediments)
- Air (Meteorology, Air Quality, Noise, Vibration, particulates, EMF)
- Soil (soil quality, physical, chemical and microbial parameters)
- Land (Land use classification, geology, landforms, topography)
- Biodiversity (and identification of affected flora and fauna)
- Socio-economic values (quality of Life Values, public health and safety, aesthetic values, archaeological, historical and cultural values)

Methodology for each component should be clearly stated, this shall be relevant to description and tabulation of the sampling stations established, key findings on the baseline profiling / values per relevant module, summary and analysis of the primary and secondary data and some other appropriate form of quantitative and qualitative information, and an explanation of the environmental indicators chosen to represent the environmental components.

Base maps shall be accurately scaled and can be easily read showing the distribution of various resources within the adjacent to the project / study area, topographical and use features of the project, and location of the sampling stations.

5.0 Associated and Potential Environmental Impacts

The identification, prediction and evaluation of potential impacts of the project on the environment should be investigated and described. These identified impacts shall be defined in terms of the following

(a) A description of direct impact and any indirect, secondary, cumulative, short, medium and long-term, permanent and temporary, positive and negative impact of the project should be addressed.

(b) The types of impact in regards to human beings, flora and fauna, soil, water, air, climate, land and socio-cultural

(c) Impacts during construction and operation phases should be considered including impacts that might arise from non-standard operating conditions, accidents e.t.c.

(d) Predicted impacts should be derived from baseline conditions as to prevail as a consequence of the project.

(e) A brief description of the impact identification method

(f) The significance of impacts should be assessed, taking into account appropriate national and international standards where available. Consideration should also be made for magnitude, location and duration of the impacts. The choice of significance assessment should be justified and any contrary opinion elaborated upon.

(g) Discussion of residual, unavoidable and cumulative impacts, (where relevant and appropriate).

(h) Mitigation measures should be described with respect to the impact of significance

Furthermore, significance shall be assigned to identified impacts associated with the proposed project, to ensure that associated and potential significant impact, are not inadvertently omitted, and how to determine an effective mitigation measures.

5.0 Mitigating Measures

The project proponent shall state the mitigation measures that shall be taken against associated and potential environmental impacts highlighted based on the EIA report. This Chapter should include the following:

a. Presentation of major interventions/actions for each identified significant environmental

impacts/issues across each project phases

b. Assessment of the likely effectiveness of the mitigating measures in terms of reducing or preventing impacts.

c. Monitoring group shall be established to monitor/ manage the development

6.1 Considering Alternatives

Early appraisal of alternatives is essential; this shall help the decision-makers to recognize different approaches to solution and to evaluate the project. These alternatives shall be:

a) No project, this could be relative to the need of the project.

b) Alternative locations for the project to obtain maximum profit from the economical, planning and environmental points of views.

c) Different scales for the project and the flexibility of its size.

d) Different alternatives for land use to reach the ultimate environmental performance.

e) Different alternatives for the construction process: day or night to avoid noises i.e.

f) In considering and evaluating alternatives, cost shall be taken as an essential factor, preferring those alternatives with minimum impact, which minimize the costs of mitigation and management.

g) It is also to be mentioned that the selection of alternative will be based on the economical sustainability, planning and environmental criteria.

Tabulation of the mitigation measures addressing the significant environmental impacts.

Impacts	**Typical Mitigation Measures**
Soil	• Installation of drainage ditches • Runoff and retention ponds • Usage of appropriate monitoring and control facilities for construction equipment deployed • Methods to reuse earth material generated during excavation

Resources– fuel/construction materials, etc.	• Availing the resources which could be replenished by natural systems, • etc.
Deforestation	• Plant or create similar areas • Initiate a tree planning program in other areas
Water pollution	• Conjunctive use of to prevent flooding / waterlogging / depletion of water resources. • Stormwater drainage system to collect surface runoff • Minimize flow variation from the mean flow • Storing of oil wastes in lagoons should be minimized in order to avoid possible contamination of the ground water system. • All effluents containing acid/alkali/organic/toxic, oil wastes should be properly treated before final discharge into environment. • Monitoring of ground waters • Dewatering of sludge and appropriate disposal of solids • By controlling discharge of sanitary sewage and industrial waste into the environment • By avoiding the activities that increases erosion or that contributes nutrients to water (thus stimulating alga growth) • All surface runoffs around mines or quarries should be collected treated and disposed. • Treated wastewater can be used as cooling water makeup. • Develop spill prevention plans in case of chemical discharges and spills
Air Pollution	• Periodic checking of vehicles and construction machinery to ensure compliance to emission standards • Attenuation of pollution/protection of receptor through

	green belts/green cover • Regular monitoring of air polluting concentrations • Wetting of roadways to reduce traffic dust and re-entrained particles • Control vehicle speed on sight • Maintaining dust levels within permissible limits • Provision for masks when dust level exceeds
Noise Pollution	• Use of suitable muffler systems/enclosures/sound-proof glass paneling on heavy equipment/pumps/blowers • Pumps and blowers may be mounted on rubber pads or any other noise absorbing materials • Limiting certain activities • Proper scheduling of high noise generating activities to minimize noise impacts • Usage of well-maintained construction equipment meeting the regulatory standards • Periodic maintenance of equipments/replacing whenever necessary/lubrication of rotating parts, etc. • By using damping, absorption, dissipation, and deflection methods • By using common techniques such as constructing sound enclosures, applying mufflers, mounting noise sources on isolators, and/or using materials with damping properties • Performance specifications for noise represent a way to insure the procured item is controlled
Biological	• Increased employee awareness to sensitive areas
Social	• Upgrade of roads and intersections • Provide sufficient counseling and time to the affected population for relocation • Discuss and finalize alternate arrangements and associated

	infrastructure in places of religious importance • Exploration of alternative approach routes in consultation with local community and other stakeholders • Provision of alternate jobs in unskilled and skilled categories
Occupational Health and Safety	• Provision of worker camps with proper sanitation and medical facilities, as well as making the worker camps self-sufficient with resources like water supply, power supply, etc • Arrangement of periodic health check-ups for early detection and control of communicable diseases. • Arrangement to dispose the wastes at approved disposal sites. • Provide preventive measures for potential fire hazards with requisite fire detection, fire-fighting facilities and adequate water storage
Construction	• Have a Transport Management Plan in place in order to prevent/minimize the disturbance on surrounding habitats
Solid / Hazardous Wastes	• Proper handling of excavated soil • Proper plan to collect and dispose the solid waste generated onsite. • Identify an authorized waste handler for segregation of construction and hazardous waste and its removal on a regular basis to minimize odour, pest and litter impacts • Prohibit burning of refuse onsite.

6.2 Environmental Management and Monitoring Program

The environmental management and monitoring program shall contain

- Detailed description of environmental management measures for each identified significant environmental impacts/issues across each project phases which will be

managed by a dedicated environmental team of the organization, including the timetable of implementation, the cost of mitigation/enhancement measures and the financial guarantee

- Organizational structure of the Environmental Management Team or office, administrative arrangements and staffing requirements
- A detailed description of the monitoring program which include, among others; the monitoring objectives to determine the actual effects and effectiveness of environmental management measures/plan, sampling design, methodology for measurement, data management and analysis, reporting schedules, budgets, equipment and supplies
- Identified monitoring and auditing requirements
- Roles and responsibilities of the project proponent and its contractors
- Public consultation (as required)

7.0 Environmental Management Plan

Specific safeguards and controls, which are proposed to be employed to minimise environmental impacts identified in previous sections, are to be included in the Environmental Management Plan (EMP) .

Where practicable, the EMP shall include:

- The proposed management structure of the operation and its relationship to the environmental management of the facility;
- Management targets and objectives for relevant environmental factors;
- The proposed measures to minimise adverse impacts and maximise opportunities, including environmental protection outcomes;
- Performance indicators by which all anticipated and potential impacts can be measured;
- Proposed monitoring programs to allow early detection of adverse impacts;
- Information on decommissioning;
- A summary listing the undertakings and commitments made in the EIA report including clear timelines for key commitments and performance indicators, with cross-references to the text of the EIA report; and
- Provision for the periodic review of the EMP itself.

8.0 Remediation Plans After Decommissioning.

Project proponent shall provide the best remediation plans that will be utilized if the facility is to be decommissioned or closed (temporarily or permanently). Both beneficial and adverse environmental effects of the decommissioning or closure shall be scrupulously stated. Mitigation measures shall be proffered for the adverse effects due to decommissioning or closure.

Project proponent shall provide in the EIA report the necessary and appropriate remediation plan that will be taken when the project is decommissioned or temporarily closed for any reason what so ever. The strategy and means of restoring the project area to its original state as much as possible and at the same time ensuring protection of the environment and humans shall be explicitly stated in the EIA report as well as implementation measures proposed.