

**ENVIRONMENTAL IMPACT  
ASSESSMENT OF YONGLI  
BIOTECHNOLOGY CO. LTD.  
(INDUSTRIAL PROTEIN POWDER  
FROM TANNERY WASTE), TAKSUR,  
MIRZANAGAR, ASHULIA, SAVAR**

ABSTRACT: Yongli Biotechnology Co. Ltd. is a specialized industrial facility that produces high-quality protein powder derived from animal leather cuttings. Strategically located in Takshur, Mirzanagar, Ashulia, Savar, Dhaka, the factory is designed to meet the growing demand for sustainable and efficient utilization of leather by-products.

**Environmental Impact Assessment (EIA) of  
Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery  
Waste)**

**ENVIRONMENTAL IMPACT ASSESSMENT (EIA) REPORT  
FOR**

**YONGLI BIOTECHNOLOGY CO. LTD.**

**Industrial Protein Powder from Tannery Waste Project**

*(Production of Industrial Protein Powder from Tannery Leather Waste for Leather Softening and Polishing  
Application)*

**Project Location**

**Takshur, Mirzanagar, Ashulia, Savar, Dhaka, Bangladesh**

**GPS Coordinate:**

**23°57'47.8 "N, 90°17'01.3 "E**

**Submitted To**

**Department of Environment (DoE)**

**Ministry of Environment, Forest and Climate Change**

**Government of the People's Republic of Bangladesh**

**Prepared For**

**Yongli Biotechnology Co. Ltd.**

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**Draft Environmental Impact Assessment (EIA) Report**

*(This report will be updated following Public Consultation in accordance with Department of Environment  
(DoE) requirements.)*

**Date of Submission: June, 2026**

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Powder from Tannery Waste)

## Declaration

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This Environmental Impact Assessment (EIA) Report has been prepared for the proposed **Yongli Biotechnology Co. Ltd. (Industrial Protein Powder from Tannery Waste) Project** in compliance with the provisions of the **Bangladesh Environmental Conservation Act, 1995 (amended 2010)**, the **Environmental Conservation Rules, 2023 (as amended)**, and relevant guidelines, circulars, and instructions issued by the **Department of Environment (DoE), Ministry of Environment, Forest and Climate Change, Government of the People's Republic of Bangladesh**.

We hereby declare that this EIA Report is the outcome of a comprehensive and systematic environmental assessment carried out in accordance with **DoE Red Category project requirements**, including:

- Approved **Terms of Reference (ToR)** issued by the Department of Environment;
- Baseline environmental data collection through field survey, site investigation, and secondary sources;
- Identification, prediction, and evaluation of potential **physical, biological, chemical, and socio-economic impacts** during the construction and operation phases;
- Consideration of environmental sensitivity, natural hazards, emergency preparedness, and climate resilience.

This EIA Report has been prepared using:

- Authentic project information provided by the project proponent, including layout plans, engineering designs, Scientific literature, national standards, and internationally accepted environmental assessment methodologies;
- Professional expertise, judgment, and experience of qualified environmental specialists.

We further certify that:

- All information presented in this report is accurate, correct, and complete to the best of our knowledge;
- No significant environmental impact has been intentionally omitted, concealed, or misrepresented;
- The proposed mitigation measures, including installation of **Effluent Treatment Plant (ETP) with Sewage Treatment Plant (STP), Industrial Protein Powder from Tannery Waste Management System, Retaining Wall, and water body protection measures**, are technically viable and environmentally appropriate.

We also declare that if the project is implemented strictly in accordance with the recommendations, mitigation measures, and environmental management provisions outlined in this EIA Report, the project will comply with all applicable environmental laws, rules, and DoE clearance conditions, and will not result in unacceptable adverse ecological impacts.

This EIA Report is submitted to the **Department of Environment (DoE)** for review and approval to obtain an **Environmental Clearance Certificate (ECC)** under the **Red Category** classification.

### DECLARATION BY THE CONSULTANT

**Name of Consulting Organization:** Global Environmental and Textile Technological Services  
**Address:** West Agargaon, Shere-E-Bangla Nagar, Dhaka -1207

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

## ***Abstract***

*This Environmental Impact Assessment (EIA) report has been prepared for the proposed Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project, located at Taksbur, Mirzanagar, Ashulia, Savar, Dhaka, Bangladesh. The proposed project is categorized under Schedule-1, Red Category (Serial No. 8) in accordance with the applicable environmental regulations and Department of Environment (DoE) requirements.*

*The proposed project aims to establish an industrial facility to produce Industrial Protein Powder from Tannery Leather Waste, with an annual production capacity of approximately 5,000 Metric Tons. The final product will primarily be used as a leather-softening and polishing agent in the leather processing industry. The project represents a resource-recovery and value-addition approach through the conversion of tannery leather waste into commercially useful industrial products.*

*The production process consists of Shredding, Washing, Hydrolysis, Filtration, Decolorisation, Concentration, Multi-Effect Evaporation, and Spray Drying, resulting in industrial protein powder. Major utilities associated with the project include 800 kW electrical demand, diesel generator backup system, approximately 155 m<sup>3</sup>/day water requirement, dedicated wastewater treatment systems, and internal water reuse arrangements.*

*A significant contextual consideration for this project is that an existing DoE-approved gelatin manufacturing facility already operates within the same industrial boundary, approximately 200 feet from the proposed project location. The existing facility processes tannery waste into gelatin for pharmaceutical capsule shell production. Therefore, the proposed project is assessed as a compatible industrial expansion within an established tannery waste processing environment, rather than a new industrial intrusion into an environmentally sensitive undeveloped area.*

*The environmental baseline investigation indicates that the project area is predominantly characterized by an industrial land-use pattern, with nearby industries, transportation infrastructure, drainage systems, and a nearby Government Khal functioning as a local drainage and surface water receptor. Ecological sensitivity of the project influence zone is relatively low, while surface water and groundwater remain environmentally important components requiring careful protection.*

*The EIA study identified potential environmental impacts associated with:*

*Industrial wastewater generation.*

*Air emissions from process operations and utility systems.*

*Solid waste and sludge generation.*

*Chemical handling and occupational exposure.*

*Noise generation from machinery and transport activities.*

*Traffic and cumulative environmental considerations.*

*Industrial wastewater will mainly originate from washing, hydrolysis, filtration, decolorisation, and cleaning operations, while domestic wastewater will originate from worker sanitation facilities*

*To control environmental impacts, the project proposes a comprehensive environmental management framework incorporating:*

*150 m<sup>3</sup>/day Effluent Treatment Plant (ETP) for industrial wastewater.*

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

*Separate Sewage Treatment Plant (STP) for domestic sewage.*

*Zero Liquid Discharge (ZLD)-oriented reuse system.*

*Air pollution control measures including dust control and stack management.*

*Chemical handling and spill prevention systems.*

*Structured solid waste and sludge management system.*

*Occupational health and safety measures.*

*Environmental monitoring and compliance program.*

*Under the proposed management arrangement:*

*No untreated wastewater will be discharged outside the project boundary.*

*No direct discharge to nearby Government Khal or surface water bodies will occur.*

*Treated water will be reused internally for non-potable applications.*

*Pollution risks will be minimized through engineering controls and operational management.*

*The project is also expected to provide positive socio-economic benefits including:*

*Employment generation.*

*Industrial value addition.*

*Resource recovery from tannery waste.*

*Promotion of circular economy practices.*

*Local economic stimulation.*

*This report is presently prepared as a draft EIA document for submission and technical review purposes. Following submission, a public consultation process will be conducted in accordance with Department of Environment (DoE) procedures, and the findings, stakeholder feedback, and consultation outcomes will be incorporated into the updated and finalized EIA report.*

*Based on the findings of the environmental assessment, the proposed Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project is considered technically feasible, environmentally manageable, and suitable for implementation, subject to effective implementation of the proposed mitigation measures, environmental management plan, monitoring commitments, and applicable regulatory requirements.*

**Environmental Impact Assessment (EIA) of  
Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery  
Waste)**

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# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## ABBREVIATION

Abbreviation	Full Form
ACF	Activated Carbon Filter
ACM	Air Quality Control Measure
ATFD	Agitated Thin Film Dryer
BOD	Biochemical Oxygen Demand
BIDA	Bangladesh Investment Development Authority
BNBC	Bangladesh National Building Code
COD	Chemical Oxygen Demand
DoE	Department of Environment
ECA	Ecologically Critical Area
ECC	Environmental Clearance Certificate
ECR	Environmental Conservation Rules
EIA	Environmental Impact Assessment
EMP	Environmental Management Plan
ETP	Effluent Treatment Plant
FGD	Focus Group Discussion
GPS	Global Positioning System
HSE	Health, Safety and Environment
KII	Key Informant Interview
kW	Kilowatt
MBBR	Moving Bed Biofilm Reactor
MEE	Multi-Effect Evaporator
MOA	Memorandum of Association
MSDS	Material Safety Data Sheet
NO <sub>x</sub>	Nitrogen Oxides

**Environmental Impact Assessment (EIA) of  
Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery  
Waste)**

<b>OHS</b>	Occupational Health and Safety
<b>PPE</b>	Personal Protective Equipment
<b>PM</b>	Particulate Matter
<b>REB</b>	Rural Electrification Board
<b>RO</b>	Reverse Osmosis
<b>SO<sub>x</sub></b>	Sulfur Oxides
<b>STP</b>	Sewage Treatment Plant
<b>TDS</b>	Total Dissolved Solids
<b>TSS</b>	Total Suspended Solids
<b>UV</b>	Ultraviolet
<b>VOC</b>	Volatile Organic Compound
<b>ZLD</b>	Zero Liquid Discharge
<b>IPP</b>	Industrial Protein Powder
<b>ITW</b>	Industrial Protein Powder from Tannery Waste
<b>YBCL</b>	Yongli Biotechnology Co. Ltd.
<b>WWTP</b>	Wastewater Treatment Plant
<b>WWG</b>	Wastewater Generation
<b>APC</b>	Air Pollution Control
<b>GOVT. KHAL</b>	Government Drainage Canal / Surface Water Channel

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

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## GLOSSARY

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- **Adverse impact:** An impact that is considered undesirable.
- **Ambient air:** Surrounding air.
- **Aquatic:** Growing or living in or near water.
- **Bangla:** Bengali language.
- **Baseline (or existing) conditions:** The „baseline“ essentially comprises the factual understanding and interpretation of existing environmental, social, and health conditions of where the business activity is proposed. Understanding the baseline shall also include the trends within it, and primarily how changes could occur regardless of the presence of the project, i.e., the „No-development Option“.
- **Bazar:** Market.
- **Beel:** A „back swamp“ or depression. It can be either perennial or seasonal.
- **Beneficial impacts:** Impacts that are considered to be desirable and valuable.
- **Biological diversity is the variety of life forms, the different plants, animals, and microorganisms, the genes they contain, and the ecosystems they form. It is usually considered at three levels: genetic diversity, species diversity, and ecological diversity.**
- **Ecosystem:** A dynamic complex of plant, animal, fungal and microorganism communities and associated non-living environments interacting as an ecological unit.
- **Emission:** The total amount of solid, liquid or gaseous pollutant emitted into the atmosphere from a given source within a given time, as indicated, e.g., in grams per cubic meter of gas or by a relative measure, upon discharge from the source.
- **Endangered species:** Species in danger of extinction and whose survival is unlikely if the existing conditions continue to operate. Among those are species whose numbers have been reduced to a critical level or whose habitats have been so drastically reduced that they are deemed to suffer from immediate danger of extinction.
- **Environmental effects are the measurable changes in the natural system of productivity and environmental quality** resulting from a development activity.
- **Environmental impact assessment (EIA) / Environmental assessment:** The systematic, reproducible, and interdisciplinary identification, prediction, evaluation, mitigation, and management of impacts from a proposed development and its reasonable alternatives, sometimes known as environmental assessment.
- **Environmental Impact:** An estimate or judgment of the significance and value of environmental effects for natural, socio-economic, and human receptors. Environment Management Plan (EMP): A Plan to undertake an array of follow-up activities that provide for the sound environmental management of a project/ intervention so that adverse environmental impacts are minimized and mitigated; beneficial ecological effects are maximized; and sustainable development is ensured.
- **Environmental Management:** Managing the productive use of natural resources without reducing their productivity and quality.
- **Erosion:** A Process in which wind and water remove materials from their original place; for instance, soil washed away from an agricultural field.
- **Evaluation:** The process of looking back at what has been really done or accomplished.
- **Fauna:** A collective term denoting the animals occurring in a particular region or period.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- **Field Reconnaissance:** A field activity that confirms the information gathered through secondary sources. This field study is essentially a rapid appraisal.
- **Flora:** All of the plants found in a given area.
- **Green Building:** The project of increasing the efficiency with which buildings and their sites use energy, water, and materials, and reducing building impacts on human health and the environment over the entire life cycle of the building.
- **Habitat:** The natural home or environment for a plant or animal.
- **Household:** A household is a dwelling unit where one or more persons live and eat together in a joint cooking arrangement. Persons living in the same dwelling unit with separate cooking arrangements constitute an individual household.
- **Important Environmental Component (IEC):** These are environmental components of biophysical or socio-economic importance to one or more interested parties. Using critical environmental components helps to focus the environmental assessment.
- **Initial Environmental Assessment / Evaluation:** A preliminary analysis undertaken to ascertain whether there are sufficient likely significant adverse impacts to warrant a „full“ EIA. In some countries, initial assessments form a means of “screening” proposed projects.
- **Water body:** A large body of water surrounded by land.
- **Mauza:** A Bangla word for the smallest government administrative area corresponding to a village revenue unit.
- **Mitigation:** An action that may prevent or minimize adverse impacts and enhance beneficial impacts.
- **Negative Impact:** Negative change from the existing situation due to the project.
- **Public involvement / Public consultation:** A range of techniques that can be used to inform, consult, or interact with stakeholders“ affected / to be affected by a proposal.“  
**Reversible impact:** An environmental impact that recovers either through natural processes or with human assistance (e.g., cutting off fish migration by an embankment might be reversible at a later stage if a proper regulator is built).
- **Stakeholders:** Those who may be potentially affected by a proposal, e.g., Local people, the proponent, government agencies, NGOs, donors, and others, all parties who may be affected by the project or take an interest in it.
- **Taka:** Unit of Bangladeshi currency.
- **Terrestrial:** Living on land.
- **Thana:** Sub-district level of government administration, comprising several unions under a district.
- **Union:** Smallest unit of local self-government comprising several villages.
- **Upazila:** Sub-district name. Upazila was introduced in 1982.
- **Zila:** Bengali word for a district.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Powder from Tannery Waste)

## CHAPTER 1 EXECUTIVE SUMMARY

---

This Environmental Impact Assessment (EIA) report has been prepared for the proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project**, located at **Takshur, Mirzanagar, Ashulia, Savar, Dhaka, Bangladesh**.

The project has been proposed to produce Industrial Protein Powder from Tannery Leather Waste, with an annual production capacity of approximately 5,000 Metric Tons (**MT/year**). The industrial protein powder produced will primarily be used as a leather softener and polishing agent in the leather processing industry.

The project falls under the **Red Category (Schedule-1, Serial No. 8)** according to applicable environmental regulations and therefore requires an Environmental Impact Assessment (EIA) prior to environmental clearance.

### 1.1 Project Background

---

The proposed project is a tannery waste resource-recovery initiative aimed at converting leather waste into value-added industrial products using modern industrial processing technology.

An important project consideration is that an **existing DoE-approved gelatin manufacturing facility** is already operating within the same industrial boundary, approximately **200 feet from the proposed project location**.

The existing facility processes tannery waste into:

- Gelatin
- Pharmaceutical capsule shell raw material

The proposed project will process similar tannery leather waste into:

- Industrial Protein Powder
- Leather softening and polishing material

Therefore, the project is considered a **compatible industrial expansion within an established tannery waste-processing environment**.

### 1.2 Project Location

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Item	Description
Project Name	Yongli Biotechnology Co. Ltd.
Project Location	Takshur, Mirzanagar, Ashulia, Savar, Dhaka
GPS Location	23°57'47.8"N, 90°17'01.3"E
Project Area	Approx. 33,418 sq.ft.
Project Type	Industrial Protein Powder from Tannery Waste

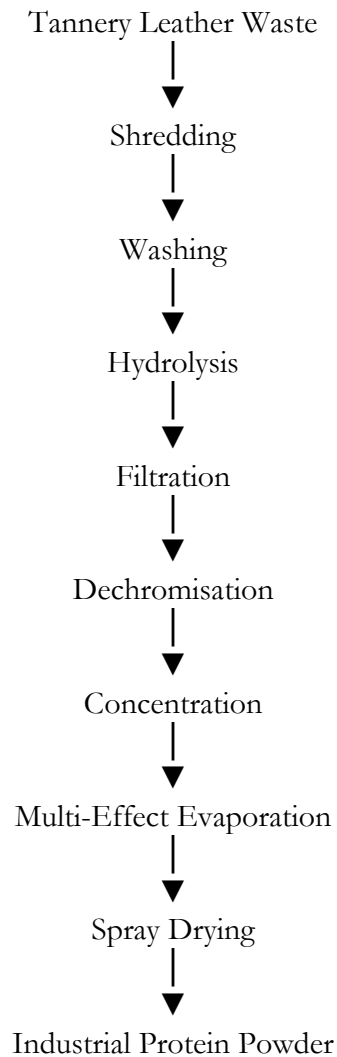
# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Entrepreneur	Mr. Lu Chengyi
Production Capacity	5,000 MT/year
Product Use	Leather softening and polishing

## 1.3 Production Process

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The production process involves the following major stages:



## 1.4 Utility Requirement

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Utility Component	Requirement
Water Requirement	Approx. 155 m <sup>3</sup> /day
Wastewater Generation	Approx. 130 m <sup>3</sup> /day
Power Requirement	Approx. 800 kW

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Generator Capacity	500 KVA
Fuel Requirement	100–150 liters diesel/day
Manpower	100–120 persons

## 1.5 Existing Environmental Condition

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The project area is predominantly industrial in nature and contains:

- Existing manufacturing industries
- Industrial utility infrastructure
- Transportation corridors
- Surface drainage systems
- Government khal (nearby drainage channel)

The environmental investigation indicates:

- No protected forest area nearby
- No ecological critical area (ECA)
- No wildlife sanctuary nearby
- No major environmentally sensitive habitat within immediate influence zone

However:

- Surface water resources remain environmentally sensitive.
- Groundwater protection is important.
- Industrial cumulative impact management is necessary.

## 1.6 Major Environmental Concerns Identified

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The EIA identified several potential environmental impacts associated with project construction and operation.

### Major Potential Impacts

- Wastewater generation
- Air emission and odor
- Sludge and solid waste generation
- Chemical handling risks

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Occupational health and safety concerns
- Noise generation
- Traffic movement increase
- Cumulative industrial impact

## 1.7 Wastewater Management Strategy

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The project proposes a comprehensive wastewater management system.

### Wastewater Sources

Industrial wastewater will mainly originate from:

- Washing section
- Hydrolysis process
- Filtration section
- Dechromisation section
- Utility and cleaning operations

Domestic wastewater will originate from:

- Toilets
- Bathrooms
- Wash basins
- Staff facilities

### Proposed Wastewater Management System

Treatment Component	Description
ETP Capacity	150 m <sup>3</sup> /day
ETP Type	Physico-Chemical + Biological
STP	Separate sewage treatment arrangement
Water Reuse	Internal reuse system
ZLD Concept	ZLD-oriented wastewater reuse approach

### Key Environmental Commitment

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- No untreated wastewater discharge outside project boundary.
- No direct discharge to Government Khal or surface water bodies.
- Internal treated water reuse system.

## **1.8 Air Pollution Management**

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Potential air emission sources include:

- Spray drying operation
- Generator operation
- Boiler/utility systems
- Raw material handling

### **Mitigation Measures**

- Bag filter/dust collector system
- Adequate stack height
- Covered raw material storage
- Periodic emission monitoring
- Good housekeeping practices

## **1.9 Solid Waste Management**

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Solid wastes may include:

- Leather residue
- Filtration residue
- ETP sludge
- Chemical waste
- Packaging waste

### **Management Measures**

- Waste segregation
- Sludge dewatering

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Secure storage
- Authorized disposal
- Recycling where feasible

## 1.10 Occupational Health and Safety

---

Potential occupational concerns include:

- Chemical exposure
- Dust inhalation
- Noise exposure
- Heat stress
- Mechanical injury

### Control Measures

- PPE usage
- Safety training
- Emergency preparedness
- Fire protection system
- Ventilation and dust control

## 1.11 Environmental Sensitivity Assessment

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Environmental sensitivity assessment indicates:

Environmental Component	Sensitivity Level
Surface Water	Moderate–High
Groundwater	Moderate
Air Environment	Moderate
Ecology	Low–Moderate
Seismicity	Moderate
Landslide	Negligible
Socio-economic Environment	Moderate

The project area is considered environmentally manageable due to:

- Existing industrial compatibility

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Presence of similar approved industry
- Proposed environmental safeguards

## 1.12 Socio-economic Benefits

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The project is expected to generate several positive socio-economic impacts:

- Employment generation
- Resource recovery from tannery waste
- Industrial value addition
- Local economic growth
- Circular economy promotion
- Technical skill development

## 1.13 Public Consultation

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The current report is being prepared as a **draft EIA report** for submission and technical review purposes.

Following submission:

- Public consultation will be conducted according to **DoE procedures**.
- Stakeholder feedback and recommendations will be incorporated.
- The EIA report will be updated and finalized accordingly.

The Environmental Impact Assessment concludes that the proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project** is:

- Technically feasible
- Environmentally manageable
- Industrially compatible
- Socio-economically beneficial

The project incorporates:

- 150 m<sup>3</sup>/day ETP
- STP
- ZLD-oriented reuse system

## **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- Pollution control systems
- Waste management framework
- Environmental monitoring plan

With proper implementation of the proposed mitigation measures and environmental management systems, the project is not expected to create significant adverse environmental impacts.

Therefore, the project is considered suitable for implementation subject to compliance with applicable environmental regulations and Department of Environment (DoE) requirements.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## CHAPTER 2 GENERAL INFORMATION

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### 2.1 Background of the Project

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Yongli Biotechnology Co., Ltd. is a proposed industrial project to produce protein powder from animal leather-cutting waste. The project is located in Takshur, Mirzanagar, Ashulia, Savar, Dhaka, a well-established industrial zone in close proximity to Savar's tannery and leather processing industries.

The project is initiated by Mr. Lu Chengyi, with the objective of utilizing leather industry by-products in an efficient and environmentally sustainable manner. The factory will have an annual production capacity of 5,000 metric tons, converting solid leather waste into value-added protein products through a series of modern processing techniques.

The production process includes shredding, washing, hydrolysis, filtration, dechromisation, concentration, multi-effect evaporation, and spray drying, resulting in the final product of industrial protein powder. This process not only ensures resource recovery but also reduces the environmental burden associated with improper disposal of leather waste.

Bangladesh, particularly the Savar region, generates a significant amount of leather waste due to numerous tanneries. Improper handling of this waste can lead to soil, water, and air pollution. In this context, the proposed project plays an important role in promoting a circular economy approach by converting waste materials into useful industrial products.

The project is categorized under the Red Category as per the Environmental Conservation Rules (ECR), 2023 of Bangladesh, which requires a detailed Environmental Impact Assessment (EIA) prior to establishment and operation. This EIA report has been prepared to assess the potential environmental impacts, identify mitigation measures, and ensure compliance with the Department of Environment (DoE) regulations.

The project's background aligns with the increasing demand for sustainable industrial practices, efficient waste management, and resource recovery technologies. By implementing appropriate environmental management systems, including a 150 m<sup>3</sup>/day Effluent Treatment Plant (ETP) for treating wastewater, the project aims to operate in an environmentally responsible manner.

Overall, Yongli Biotechnology Co. Ltd. represents an initiative towards industrial sustainability, pollution reduction, and economic development, contributing positively to both the local industry and the national economy.

### 2.2 Project Context

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The proposed project, Yongli Biotechnology Co. Ltd., has been conceptualized within the broader framework of sustainable industrial development, resource recovery, and environmental protection. The project aims to convert animal leather cutting waste into industrial protein powder, thereby addressing both industrial demand and environmental challenges associated with the leather sector in Bangladesh.

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

Bangladesh is one of the leading countries in the leather and leather products industry, with a significant concentration of tanneries and related industries in the Savar region. The relocation of tanneries to the Savar Tannery Industrial Estate has generated substantial quantities of solid waste, including leather trimmings, shavings, and offcuts. These wastes, if not properly managed, pose serious environmental risks, including soil contamination, groundwater pollution, and public health hazards due to the presence of chromium and other chemicals.

In this context, the establishment of Yongli Biotechnology Co. Ltd. is highly relevant, as it introduces a waste-to-resource conversion approach. By using leather waste as a raw material, the project helps reduce the burden on landfills and minimize the leather industry's environmental footprint. The project aligns with national priorities for sustainable waste management, circular economy practices, and industrial pollution control.

Furthermore, there is growing global and domestic demand for industrial protein powder, which is used across sectors such as animal feed, fertilizers, adhesives, and the chemical industry. The project is therefore positioned to meet market demand while ensuring environmentally sound production practices.

## **2.2.1 Technical Feasibility**

The proposed production process—comprising shredding, washing, hydrolysis, filtration, dechromisation, concentration, multi-effect evaporation, and spray drying—is based on proven and widely accepted technologies in the protein extraction and rendering industry.

- The technology ensures efficient breakdown of collagen and protein structures from leather waste.
- The inclusion of a dechromisation unit ensures the removal of chromium and heavy metals, which is critical for environmental compliance and product safety.
- The use of multi-effect evaporation and spray-drying systems enhances energy efficiency and ensures the production of a high-quality powdered product.
- The availability of the required machinery, technical expertise, and operational knowledge further supports the project's technical viability.

## **2.2.2 Resource Availability**

The project's location in Ashulia, Savar, provides a significant advantage in raw material availability. Large quantities of leather waste are generated daily from nearby tanneries, ensuring a consistent and reliable supply chain.

**Water Supply:** Adequate water is available through industrial utility connections and/or deep tube wells.

**Energy Supply:** Reliable electricity and fuel sources are available to support the continuous operation of machinery such as dryers and evaporators.

**Human Resources:** The area has access to skilled and semi-skilled labor, as well as technical professionals experienced in industrial operations.

## **2.2.3 Environmental Feasibility**

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

The project incorporates necessary environmental control measures to ensure compliance with regulatory standards:

- Installation of a 150 m<sup>3</sup>/day Effluent Treatment Plant (ETP) for treatment of wastewater, ensuring discharge meets Department of Environment (DoE) standards.
- Implementation of air pollution control systems such as cyclones, scrubbers, or bag filters in drying units.
- Proper management of solid waste and sludge, including safe disposal or reuse where feasible.
- By integrating these measures, the project minimizes adverse environmental impacts and promotes environmentally responsible industrial practices.

## **2.2.4 Economic Feasibility**

The project is economically viable due to the following factors:

- Low-cost raw materials, as leather waste is readily available and often considered a by-product.
- High market demand for industrial protein powder in domestic and international markets.
- Opportunities for value addition, transforming low-value waste into commercially valuable products.
- Potential for job creation, contributing to local economic development.
- The combination of low input costs and high-value output ensures a favorable cost-benefit ratio and an attractive return on investment (ROI).

## **2.2.5 Regulatory and Institutional Feasibility**

The project falls under the Red Category as per the Environmental Conservation Rules (ECR), 2023, and requires a detailed environmental assessment and clearance from the Department of Environment (DoE).

The proponent has undertaken this Environmental Impact Assessment (EIA) to ensure full compliance with national environmental regulations. The project design incorporates all necessary mitigation and management measures to obtain and maintain environmental clearance.

## **2.3 Overall Feasibility Justification**

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Considering the availability of raw materials, proven technology, environmental safeguards, economic benefits, and regulatory compliance, the proposed project is technically, environmentally, and economically feasible.

The project not only addresses leather waste management but also contributes to resource recovery, pollution reduction, and sustainable industrial development. Therefore, the establishment of Yongli Biotechnology Co. Ltd. is well justified within the current industrial and environmental context of Bangladesh.

## **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

Both **primary and secondary data** were used to assess the potential **economic, social, and environmental impacts** of establishing the leather industry by-products in an efficient manner at the proposed location.

To ensure a comprehensive assessment of all aspects of feasibility, the following approaches were adopted:

<b>Method</b>	<b>Description</b>
Review of Secondary Data	Analysis of existing reports, statistical data, policies, and sectoral documents.
Community Surveys	Collection of primary data through structured community-level surveys.
Key Informant Interviews (KII)	Interviews with relevant officials and stakeholders.
Focus Group Discussions (FGD)	FGDs were conducted with landowners, local government representatives, and affected persons.
Institutional Consultations	Consultative meetings were held with the Deputy Commissioner, the Additional Deputy Commissioner (Revenue), the Land Acquisition Officer, the Department of Agriculture, the Public Works Department, and other relevant government offices.
Academic Consultation	Meetings with Yongli Biotechnology Co., Ltd., administration, and faculty members to assess institutional needs and expectations.
Field Investigation	Physical inspection of the proposed project site and surrounding areas.

**YONGLI BIOTECHNOLOGY CO. LTD. (INDUSTRIAL PROTEIN POWDER FROM TANNERY WASTE)** intends to build a leather industry by-product in an efficient manner at Takshur, Mirzanagar, Ashulia, Savar, Dhaka. Geographically, the project lies between 23°57'47.8 "N & 90°17'01.3 "E.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Powder from Tannery Waste)

## 2.4 Project description

The proposed project, Yongli Biotechnology Co. Ltd., located in **Takshur, Mirzanagar, Ashulia, Savar, Dhaka**, is an Industrial Protein Powder manufacturing project led by entrepreneur **Mr. Lu Chengyi**. The factory will produce high-quality products.

The proposed project shall not be contrary to any development plan, policy or decision of the Government.

## 2.5 Basic Data of the proposed project

Sl. No.	Particulars	Details
1	Project Name	<b>Yongli Biotechnology Co. Ltd.</b>
2	Project Type	<b>Industrial Protein Powder Manufacturing from Tannery Leather Waste</b> (Tannery Waste to Value-Added Industrial Product)
3	Project Category	Schedule-1, <b>Red Category</b> , Serial No. 8 (as per ECR 2023)
4	Name of the Entrepreneur	<b>Mr. Lu Chengyi</b>
5	Designation of Entrepreneur	Chairman
6	Project Location	Takshur, Mirzanagar, Ashulia, Savar, Dhaka
7	Head Office Address	Takshur, Mirzanagar, Ashulia, Savar, Dhaka
8	Project Area	Approx. <b>33,418 sq.ft.</b> (as per Fire Service License)
9	Project Cost	Approx. <b>BDT 94,480,000</b> (as per BIDA/MOA)
10	Nature of Project	Proposed industrial unit for production of <b>Industrial Protein Powder from Tannery Leather Waste</b> to be used as <b>leather softener and polishing agent</b>
11	Existing Industrial Context	An existing <b>DoE-approved gelatin manufacturing factory</b> is located within the same industrial boundary. The existing facility converts tannery waste into <b>gelatin for pharmaceutical capsule shell production</b> . The proposed project will be established approximately <b>200 ft from the existing facility</b> .
12	Final Product	Industrial Protein Powder

**Environmental Impact Assessment (EIA) of  
Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery  
Waste)**

13	<b>Application of Product</b>	Leather softening, leather polishing, and allied leather finishing applications
14	<b>Raw Material</b>	Tannery Leather Waste / Leather Cutting Waste
15	<b>Production Capacity</b>	<b>5,000 Metric Tons per Year (MT/year)</b>
16	<b>Daily Production Capacity</b>	Approx. <b>16.67 MT/day (~17 MT/day)</b> based on 300 operating days/year
17	<b>Production Process</b>	Shredding → Washing → Hydrolysis → Filtration → Dechromisation → Concentration → Multi-Effect Evaporation → Spray Drying → Finished Protein Powder
18	<b>Power Requirement</b>	Approx. <b>800 kW</b> (Supply from REB)
19	<b>Fuel Requirement</b>	Approx. <b>100–150 liters diesel/day</b>
20	<b>Water Requirement</b>	Approx. <b>155 m<sup>3</sup>/day</b>
21	<b>Raw Water Source</b>	Own Deep Tube Well
22	<b>Submersible Pump</b>	2 Nos. Pumps
23	<b>Industrial Wastewater Generation</b>	Generated mainly from <b>Washing, Hydrolysis, Filtration, and Dechromisation Sections</b>
24	<b>Wastewater Quantity</b>	Approx. <b>130 m<sup>3</sup>/day</b> (within ETP operational design limit with 10% freeboard consideration)
25	<b>ETP Capacity</b>	<b>150 m<sup>3</sup>/day (≈7 m<sup>3</sup>/hour)</b>
26	<b>ETP Type</b>	<b>Physico-Chemical + Biological Treatment System</b> integrated with <b>Zero Liquid Discharge (ZLD) Program</b>
27	<b>Wastewater Management Strategy</b>	Wastewater treatment through <b>ETP + ZLD (RO + Evaporation based recovery/reuse system)</b>
28	<b>Solid Waste Generation</b>	Filter cake, ETP sludge, packaging waste, leather residue, carton, plastic containers
29	<b>Solid Waste Management</b>	Segregation, recycling, sludge dewatering, authorized disposal
30	<b>Manpower Requirement</b>	Approx. <b>100–120 persons</b>
31	<b>Factory Operation Schedule</b>	<b>3 Shifts, 6 Days per Week</b>

**Environmental Impact Assessment (EIA) of  
Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery  
Waste)**

32	<b>Generator Capacity</b>	<b>500 KVA Diesel Generator</b>
33	<b>Machinery / Major Equipment</b>	Shredder, Washing Unit, Hydrolysis Reactor, Filtration Unit, Dechromisation Unit, Concentration System, Multi-Effect Evaporator (MEE), Spray Dryer (1300 kg/hr), ETP & ZLD System
34	<b>GPS Location</b>	<b>23°57'47.8" N, 90°17'01.3" E</b>
35	<b>Surrounding Environment / Boundary Condition</b>	<b>North:</b> Vacant land (~250 m), Kaizen Metal Industries Bd. Ltd., Dhaka-Aricha Highway <b>South:</b> <b>Yongli Biotechnology, another project;</b> Khal, Nabinogor Textile Ltd., Aaron Denim Ltd., Uzzal Fabrics Ltd. <b>East:</b> Berger Becker Bangladesh Ltd. <b>West:</b> Vacant Area, Semi-Pacca Road, Local Settlement
36	<b>Liquefaction Consideration</b>	Site falls within <b>moderate seismic sensitivity zone</b> ; structural design will follow BNBC provisions
37	<b>Process Flow Diagram</b>	<b>Raw Material (Tannery Leather Waste) → Shredding → Washing → Hydrolysis → Filtration → Dechromisation → Concentration → Multi-Effect Evaporation → Spray Drying (1300 kg/hr) → Finished Product: Industrial Protein Powder</b>
38	<b>Responsible Contact Person</b>	<b>Mr. Parvez</b>
39	<b>Designation of Contact Person</b>	Project Coordinator
40	<b>Contact Number</b>	<b>+880 1779 068605</b>
41	<b>Nearby Receiving Water Body / Drainage</b>	Government Khal
42	<b>Environmental Compliance Context</b>	The proposed facility is adjacent to an existing DoE-approved tannery waste-processing industry operating within the same boundary; environmental compatibility and industrial suitability are already established for handling similar feedstocks.

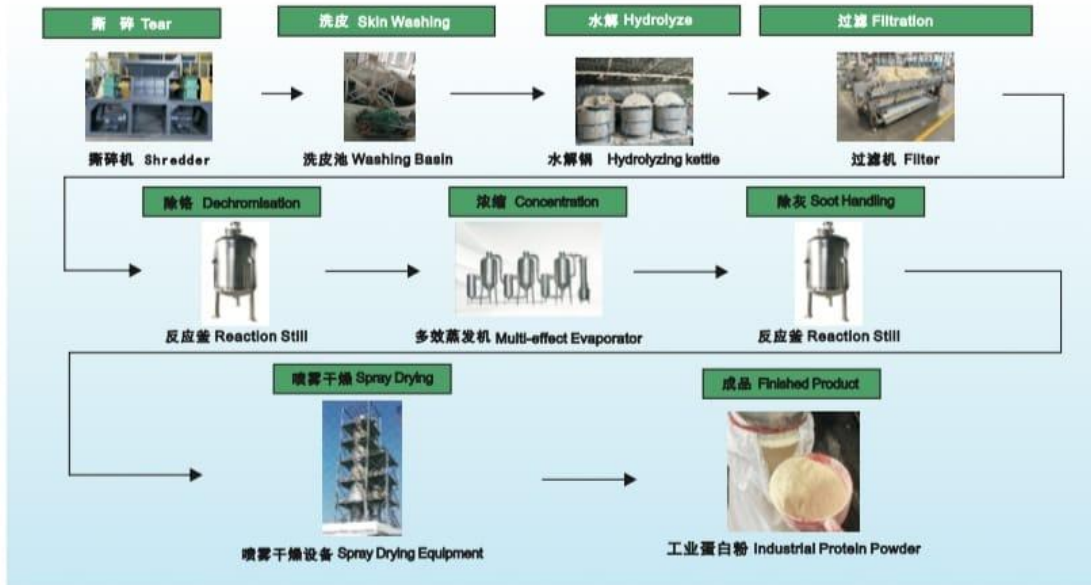
**2.6 Process Flow: Industrial Protein Powder**

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

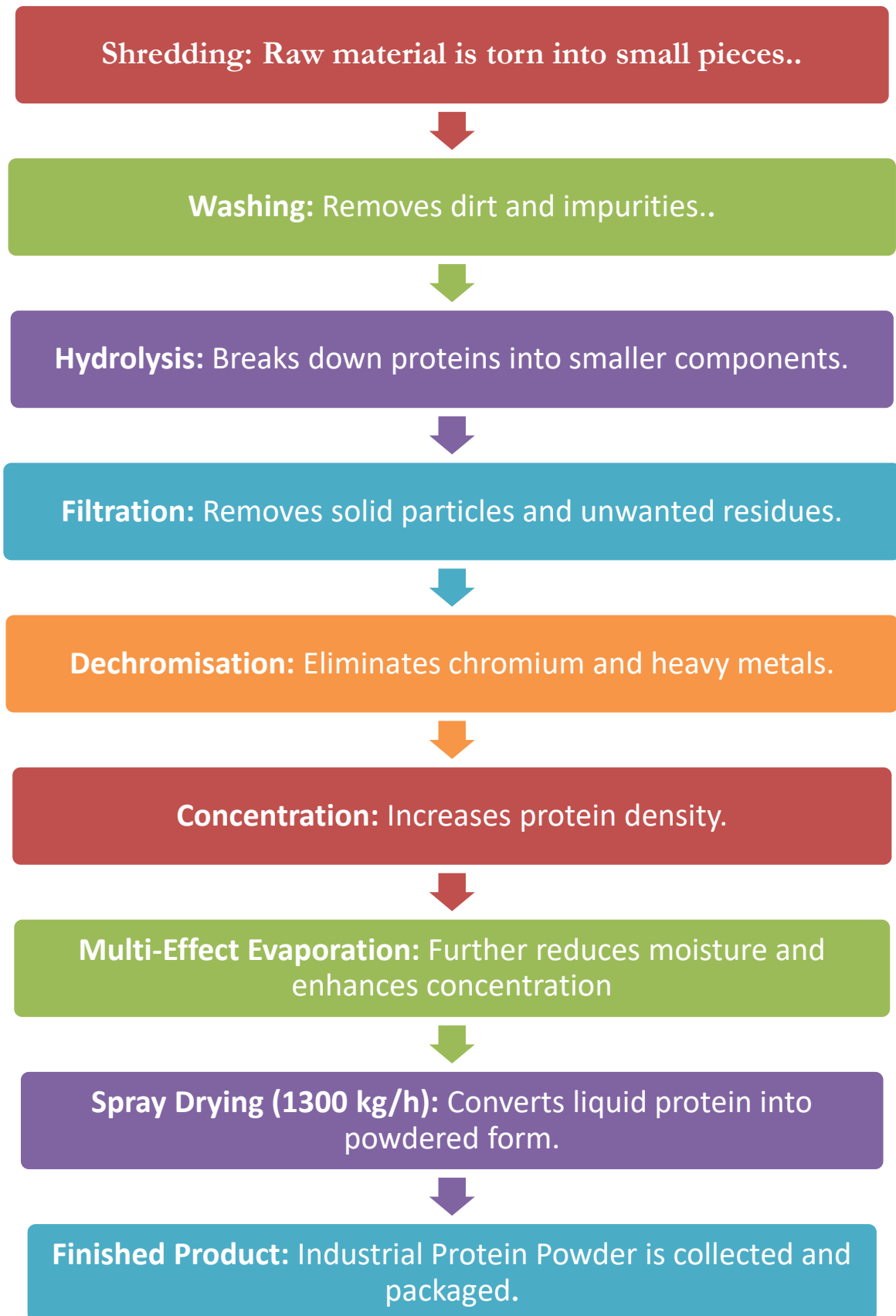
工业蛋白  
Industrial Protein

河北盛铭机械设备有限公司  
HEBEI SHENGMING MACHINERY EQUIPMENT CO., LTD

Industrial Protein 工业蛋白



**Environmental Impact Assessment (EIA) of  
Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery  
Waste)**



This process ensures the efficient recycling of waste fabrics into high-quality yarn.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 2.7 Daily Water Consumption & Wastewater Generation Calculation

---

### 2.7.1 Wastewater-Producing Sections in the Production Process

Based on the **industrial protein powder production process**, wastewater is generated mainly in the following stages:

1. **Washing** – Remove dirt, dust, and impurities from raw materials.
2. **Hydrolysis** – Chemical breakdown of proteins using water.
3. **Filtration** – Separation of solid residues from the liquid protein solution.
4. **Dechromisation** – Removal of chromium and heavy metals (produces contaminated wastewater).
5. **Concentration & Multi-Effect Evaporation** – This may generate some liquid waste during moisture reduction.

### 2.7.2 Wastewater Calculation

- **Annual Production Capacity = 5000 metric tons (MT) of protein powder**
- **Industry Standards for Wastewater Generation:**
  - **Washing & Processing: 5-6 m<sup>3</sup> of wastewater per ton of product**
  - **Dechromisation & Filtration: Additional 1-2 m<sup>3</sup> per ton (consider as COD<sub>Cr</sub>)**
  - **Total Wastewater Generation Estimate = 6-8 m<sup>3</sup> per ton**
  - **Effluent Treatment Plant (ETP) Capacity = 150 m<sup>3</sup>/day**

#### Daily Production Calculation

$$\begin{aligned} \text{Daily Production} &= \frac{\text{Annual Production}}{\text{Working Days per Year}} \quad [\text{Assuming } 300 \\ \text{working days per year (typical industrial operation)}] & \\ &= \frac{5000 \text{ MT}}{300} \\ &= 16.67 \approx 17 \text{ MT per day} \end{aligned}$$

#### Daily Wastewater Generation Calculation

Daily Wastewater = Daily Production × Wastewater per ton

For **minimum wastewater generation** (6 m<sup>3</sup> per ton):

$$= 17 \times 6 = 102 \text{ m}^3 \text{ per day}$$

For **maximum wastewater generation** (9 m<sup>3</sup> per ton):

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

$$=17 \times 8 = 136 \text{ m}^3 \text{ per day}$$

## Final Estimation:

- **Estimated Daily Wastewater Generation: 102 - 136 m<sup>3</sup> per day**
- **ETP Capacity: 150 m<sup>3</sup> per day** (sufficient for treatment)

This confirms that the **150 m<sup>3</sup> ETP is adequately designed** to handle the plant's wastewater load.

## 2.8 Steps in the EIA Process

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EIA steps are shown in the flowchart:

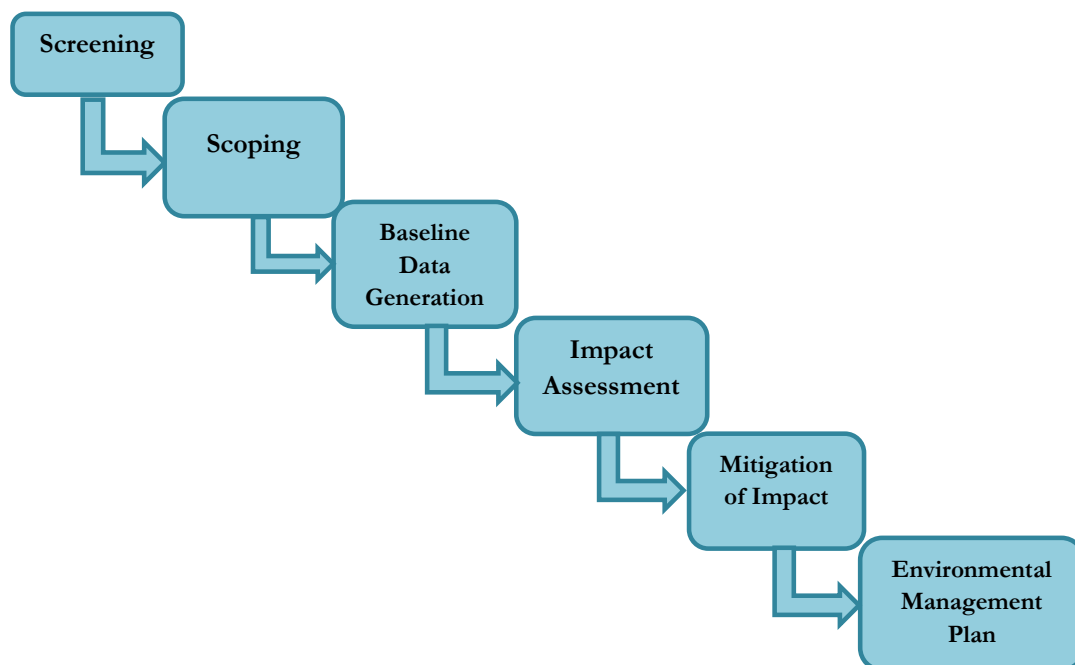


Figure 2-1 Flowchart of EIA Steps

## 2.9 Yongli Biotechnology Co. Ltd. (Industrial Protein Powder from Tannery Waste) Commitments

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We adhere to the rules and regulations governing land use, guided by government regulations and various codes. We always uphold the basic code of conduct that is stated below-

- Child labor is strictly prohibited.
- Providing pure drinking water to the customers.
- No Discrimination for hiring people;
- First aid treatment and legal minimum wages;
- Strictly maintained overtime hours and payments, as well as safety.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Deliver the social-economic benefits to employees and our dependents to uplift their livelihood.
- Complying with applicable environmental legislation and regulations;
- Conservation of natural resources through responsible management of energy and water use;
- Adopting cost-effective measures in the prevention of pollution from our processes;
- Motivating and preparing all employees to take personal accountability for protecting the environment;
- Planning, implementing, and reviewing environmental objectives and targets;

## 2.10 EIA Team

A good, qualified, knowledgeable, and energetic Global Environmental and Textile Technological Services team has contributed to the preparation of this EIA report. They are experts in different fields of engineering, science, and sociology. During the preparation of this report, they have sat together, held roundtable meetings, conducted field visits, and had conversations with clients and people near the project.

Table 2-1 EIA Team

S. L.	Profile	Details		Expertise sector
1	<b>Professor Md. Mostafizur Rahman, PhD</b>	Designation	Professor Department of Environmental Sciences	<ul style="list-style-type: none"> <li>• Pollution Control, Prevention, and Monitoring.</li> <li>• Pollution Control and Prevention (ETP, STP) and Monitoring.</li> <li>• Waste Management</li> <li>• General Environmental Management,</li> </ul>
		Title	Tam leader	
		Qualification	PhD, Environmental Science	
		Experience	20 years	
		Institution	Jahangirnagar University	
		Mail ID	Env.mustafiz@yahoo.com	
3	<b>Kamrul Islam</b>	Designation	Geology Expert	<ul style="list-style-type: none"> <li>• Ecology and Biodiversity</li> <li>• Land Use Planning</li> <li>• General Environmental Management,</li> <li>• Waste Management</li> <li>• Risk Assessment and Hazard Management</li> <li>• Health Impacts assessment</li> </ul>
		Title	Team Member	
		Qualification	M.Sc. & B.Sc. in Geological Sciences.,	
		Experience	12 years	
		Institution	Jahangirnagar University	
		Mail ID	kamrul.ju.geo@gmail.com	
4	Md. Mizanur Rahman	Designation	Civil Engineer	<ul style="list-style-type: none"> <li>• Control and Prevention (ETP, STP) and Monitoring.</li> <li>• Land Use Planning</li> <li>• Waste Management</li> <li>• Groundwater and Hydrology</li> </ul>
		Title	Team Member	
		Qualification	Dip. in Civil Engr. PPI	
		Experience	12 years	
		Mail ID	mizanglobal14@gmail.com	

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

5	<b>Md. Shaik Hassan Ashik</b>	Designation	Team Member	<ul style="list-style-type: none"> <li>Modeling and Prediction of Pollution Control and Prevention (ETP, STP) and Monitoring.</li> <li>Waste Management</li> <li>General Environmental Management,</li> <li>Social Impact Assessment</li> <li>Risk Assessment and Hazard Management</li> <li>Health Impacts assessment</li> </ul>
		Title	Environmental Chemist	
		Qualification	MSc. In Chemistry	
		Experience	6 Years	
		Institution	Jagannath University, Dhaka	
Mail ID	ashik111955@gmail.com			
6	<b>Shumya Jannat</b>	Designation	Environmental Executive	<ul style="list-style-type: none"> <li>Ecology and Biodiversity</li> <li>Land Use Planning</li> <li>General Environmental Management,</li> <li>Social Impact Assessment</li> </ul>
		Title	Team member	
		Qualification	B.Sc. & M. Sc. in Environmental Sciences	
		Experience	5 years	
		Institution	Jahangirnagar University	
Mail ID	shumya.getts@gmail.com			
5	<b>Mr. Parvez</b>	Designation	Team Member	<ul style="list-style-type: none"> <li>Project responsible</li> </ul>
		Title	General Manager	
		Qualification	B.S.C. in Civil Engineering Experience:11 years in construction-related works	
		Experience	11 Years	
		Mail ID	+880 1779 068605	
6	<b>Mohammad Taukir Hossain.</b>	Designation	Mechanical Works. Qualifications: B.S.C. in Mechanical Engineering Experience: 4 years in construction-related work. Email: taukirhossain280@gmail.com	<ul style="list-style-type: none"> <li>Project Responsible</li> </ul>

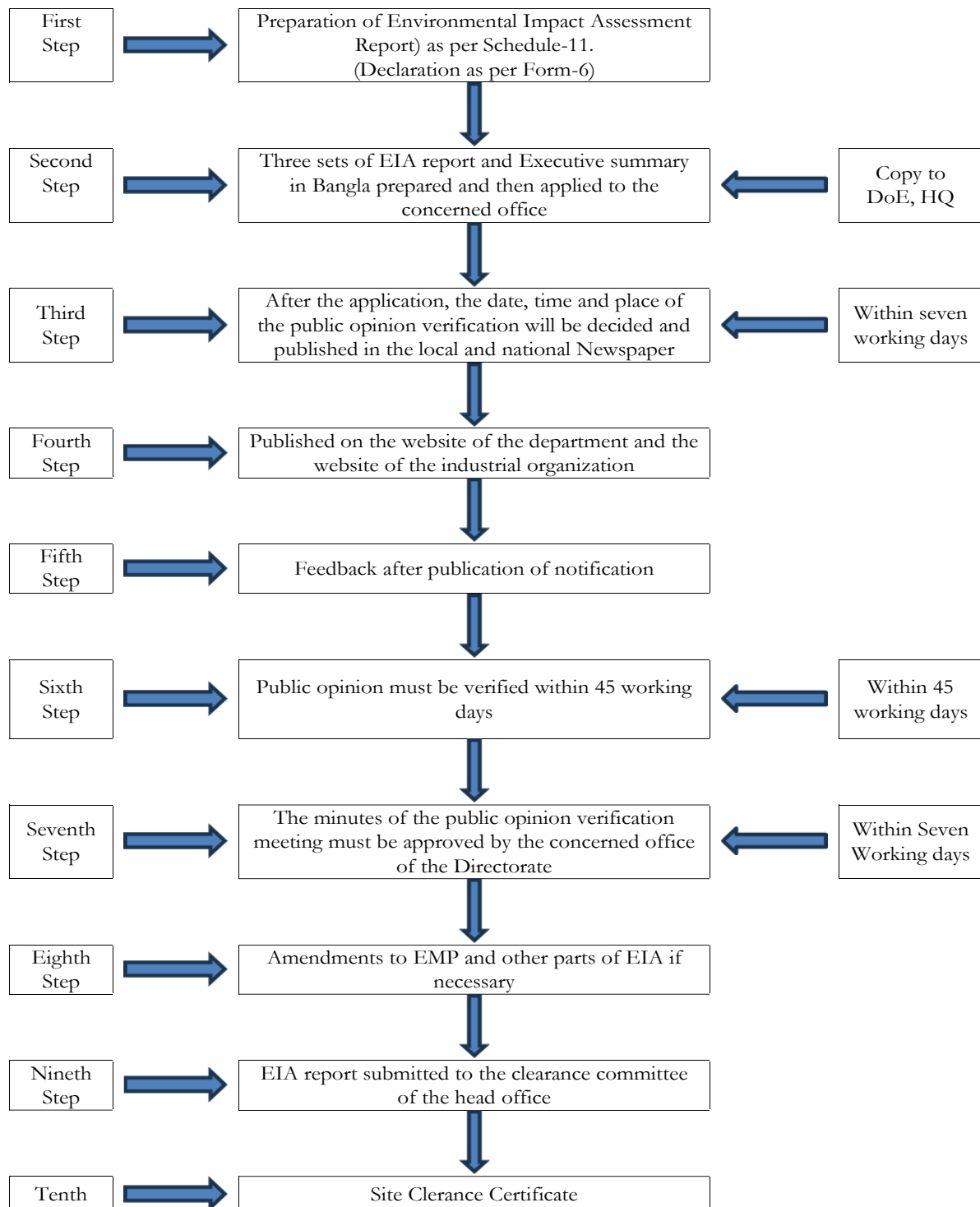
### 2.11 Procedure for Obtaining Site/Environmental Clearance

All industries and projects in the red category must conduct EIAs, which help assess the potential extent of environmental changes and identify mitigation measures by drawing on available experience and standard operating practices. The steps for conducting EIAs are:

- Collection of baseline information with respect to the project and the environmental setting of the project and its site.
- Setting boundaries of an IEE by identifying the significant issues.
- Impact assessment suggesting mitigation measures, Environmental Management Plan (EMP), or alternative sites or other project modifications.
- If the IEE of the project or industry reveals that further investigation is to be carried out, the sponsors will have to carry out a detailed EIA.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 2.11.1 Procedure



After completion of the EIA Report, the project proponent should apply to the DOE in the prescribed format for site/ environmental clearance. The application for environmental clearance for the project classified in the Red Category should be accompanied by the following documents:

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Feasibility Study Report of the industry (project)
- IEE report
- An NOC (No Objection Certificate) from the local authorities concerned
- Pollution minimization plan, including an emergency plan for mitigation of adverse environmental impacts
- Outline of relocation plans (where applicable)
- Other information as deemed necessary

Environmental Conservation Rules-2023 ensure the right of any aggrieved party to appeal against the notice order or decision to the appellate authority. The appeal should be made to the appellate authority with clear justification and the attested copy of the DoE office against which the appeal is to be made. The focus of the ECR, 2023, lies with the classification of industries into three main categories, i.e., Green, Orange, and Red, based on their pollution potential. Documents required by respective DoE divisions for different categories are as follows:

## 2.12 National Environmental Standards/Guidelines

Bangladesh Environmental standards and guidelines relevant to the construction and operation of the project cover the following issues:

- Water Quality
- Atmospheric emissions and ambient air quality;
- Liquid effluent discharges
- Noise emissions and ambient noise levels.

### 2.12.1 Water Quality

Table 2-2 Standard for Inland Surface Water

Best practice-based classification	Parameter											
	PH	DO mg/l	BO D mg/l	NO <sub>3</sub> -N mg/l	NH <sub>4</sub> -N mg/l	PO <sub>4</sub> -P mg/l	Tot al Cr mg/l	Pb mg/l	Hg mg/l	Total Coliform Number/100 ml	TDS mg/l	CO D mg/l
1 Source of drinking water for supply only after disinfecting	6.5 - 8.5	≥6	≤2	7	0.1	0.1	0.02	0.03	0.001	≤100	1000	10
2 Water usable for recreational activity	6.5 - 8.5	≥5	≤3	7	0.3	0.5	0.2	0.05	0.001	≤50	1000	10

**Environmental Impact Assessment (EIA) of  
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3	Source of drinking water for supply after conventional treatment	6.5 - 8.5	≥5	≤3	7	0.3	0.5	0.02	0.03	0.001	≤5000	1000	25
4	Water usable by fisheries	6.5 - 8.5	≥5	≤6	7	0.3	0.5	0.05	0.1	0.004	≤5000	1000	50
5	Water usable by various process and cooling industries	6.5 - 8.5	≥1	12	-	2.7	-	0.1	0.1	0.05	-	1000	100
6	Water usable for irrigation	6.5 - 8.5	-	≤12	5	1.5	2.0	0.1	0.1	0.002	≤50000	1000	100

Source: Schedule 2, Environmental Conservation Rules-2023, Inland surface water parameter

**Notes:**

1. Electrical conductivity for irrigation water –2250 µmhoms/cm (at a temperature of 25°C); Sodium less than 26%; boron less than 0.2%.

Table 2-3 Standards for Drinking Water

S.N.	Parameter	Unit	Standards
1.	Fecal Coliform	CFU/100 ml	0
2.	Total Coliform	”	0
3.	Free Residual Chlorine	mg/l	0.20
4.	Nitrate (NO <sub>3</sub> <sup>-</sup> )	mg/l	45
5.	Arsenic (As)	mg/l	0.05
6.	Turbidity	NTU	5
7.	Aluminum	mg/l	0.20
8.	Ammonia (NH <sub>3</sub> )	”	1.50
9.	Barium (Ba)	”	0.70
10.	Benzene (C <sub>6</sub> H <sub>6</sub> )	”	0.01
11.	Boron (B)	”	1.0
12.	Cadmium (Cd)	”	0.003
13.	Calcium	”	75
14.	Chloride	”	250*
15.	Carbon Tetra-chloride (CCL <sub>4</sub> )	mg/l	0.005
16.	1,1 Dichloro Ethylene (1,1 C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> )	”	0.03

**Environmental Impact Assessment (EIA) of  
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17.	1,2 Dichloro Ethylene (1,2 C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> )	”	0.03
18.	Tetrachloro Ethylene (C <sub>2</sub> H <sub>4</sub> Cl <sub>2</sub> )	”	0.04
19.	Trichloro Ethylene (C <sub>2</sub> H <sub>3</sub> Cl <sub>3</sub> )	”	0.02
20.	Pentachlorophenol	mg/l	0.09
21.	2,4,6 trichlorophenol	”	0.20
22.	Chloroform	”	0.09
23.	Total Chromium (Total Cr)	”	0.05
24.	Color	Hazen Unit	15
25.	Copper	mg/l	1.5
26.	Cyanide (CN)	”	0.05
27.	Fluoride	”	1.0
28.	Hardness (as CaCO <sub>3</sub> )	”	500
29.	Iron (Fe)	”	0.3-1.0
30.	Total Kjeldhl Nitrogen	”	1.0
31.	Lead (Pb)	”	0.01
32.	Magnesium (Mg)	”	30-35
33.	Manganese (Mn)	”	0.4
34.	Mercury (Hg)	”	0.001
35.	Nickel (Ni)	”	0.05
36.	Nitrite (NO <sub>2</sub> )	”	1.0
37.	Odor	-	Odorless
38.	Oil and grease	mg/l	0.01
39.	p <sup>H</sup>	-	6.5-8.5
40.	Phenolic compounds	mg/l	0.002
41.	Potassium (K)	”	12
42.	Radioactive materials (gross alpha activity)	Bq/l	0.1
43.	Radioactive materials (gross beta activity)	”	1.0
44.	Selenium (Se)	mg/l	0.01
45.	Silver	”	0.02
46.	Sodium (Na)	”	200
47.	Suspended Solid (SS)	”	10
48.	Sulfide as H <sub>2</sub> S	”	0.05
49.	Sulfate (SO <sub>4</sub> <sup>-2</sup> )	”	250
50.	Total dissolved solids (TDS)	”	1000
51.	Temperature	°C	20-30
52.	Tin (Sn)	mg/l	2.0
53.	Zinc (Zn)	mg/l	5.0
54.	Aldrin/Dieldrin	µg/l	0.03
55.	Anionic detergent	mg/l	0.2

Source: Environmental Conservation Rule-2023, Schedule-2, Standards for drinking water

**Note**

\*For estuarine area 1000 mg/l

Table 2-4 Standard for Sewage Discharge

Parameter	Unit	Standard Limit
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# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Temperature	Degree Centigrade	30
pH	-	6-9
BOD <sub>5</sub> at 20°C	mg/l	30
COD	mg/l	125
Suspended Solids (SS)	mg/l	100
Oil & Grease	mg/l	10
Nitrate (NO <sub>3</sub> )	mg/l	50
Phosphate (PO <sub>4</sub> )	mg/l	15
Total Coliform	Number/100 ml	1000

Source: Environmental Conservation Rule-2023, Schedule-6, Standards for sewage discharge

Note: 1. The limit shall apply to discharges into surface and inland water bodies.

2. Sewage shall be chlorinated before final discharge.

## 2.12.2 Ambient Air Quality

Table 2-5 Standards for Air

S.N.	Categories of Area	Suspended Particulate Matters (SPM)	Sulphur-dioxide (SO <sub>2</sub> )	Carbon Monoxide (CO)	Oxides of Nitrogen (NO <sub>x</sub> )
		$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$	$\mu\text{g}/\text{m}^3$
a.	Industrial and mixed	500	120	5000	100
b.	Commercial and mixed	400	100	5000	100
c.	Residential and rural	200	80	2000	80
d.	Sensitive	100	30	1000	30

Source: Schedule 2, Environmental Conservation Rules, 1997, and Air Pollution Control Rules 2022

### Notes:

1. At the national level, sensitive area includes monuments, health center, Industrial Protein Powder from Tannery Waste projects, archeological sites, educational institutions, and government-designated areas (if any).
2. Industrial units located in areas not designated as industrial areas shall not discharge pollutants which may contribute to exceeding the standard for air surrounding the areas specified at Sl. nos. c and d above.

Suspended Particulate Matter means airborne particles of a diameter of 10 micron or less.

Table 2-6 Standard for Odor

Sl. No.	Parameter	Unit	Value
1	Acetaldehyde	Ppm	0.5-5
2	Hydrogen sulfide	Ppm	0.02-0.20
3	Methyl disulfide	Ppm	0.009-0.10

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

4	Methyl mercaptan	Ppm	0.02-0.20
5	Methyl sulfide	Ppm	0.01-0.20
6	Styrene	Ppm	0.4-2.00
7	Tri-methyl-amine	Ppm	0.005-0.07
8	Ammonia	Ppm	1-5

Source: Air Pollution Control Rules, 2022, Standards for odor.

Table 2-7 Standard for Emissions from Motor Vehicles

Parameter	Unit	Standard Limit
<b>Black Smoke</b>	Hartridge Smoke Unit (HSU)	<b>65</b>
<b>CO</b>	gm/km	<b>24</b>
	percent area	<b>04</b>
<b>Hydrocarbon</b>	gm/km	<b>02</b>
	ppm	<b>180</b>
<b>NO<sub>x</sub></b>	gm/km	<b>02</b>
	ppm	<b>600</b>

Source: Environmental Conservation Rule-1997 and Air Pollution Control Rules, 2022, Schedule-6, Standards for emission from motor vehicles \*As measured at two-thirds of maximum rotating speed.

## 2.12.3 Ambient Noise Standards

Table 2-8 Standards for sound

SN	Category for sound	Standards determined (dBA)	
		Day	Night
<b>a.</b>	Silent Zones (Sensitive areas such as parks, schools, Industrial Protein Powder from Tannery Waste projects, and mosques)	50	40
<b>b.</b>	Residential areas	55	45
<b>c.</b>	Mixed areas (mainly residential areas, and also simultaneously used for commercial and industrial purposes)	60	50
<b>d.</b>	Commercial areas	70	60
<b>e.</b>	Industrial areas	75	70

Source: Schedule 1, Sound Pollution Rules, 2025

**Notes:** The time from 6 a.m. to 9 p.m. is counted as daytime.

- The time from 9 p.m. to 6 a.m. is counted as nighttime.
- Area up to a radius of 100 meters around Industrial Protein Powder from Tannery Waste projects, educational institutions, or special institutions/ establishments identified/ to be identified by the Government is designated as Silent Zones where use of horns of vehicles or other audio signals, and loudspeakers is prohibited.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## CHAPTER 3 PROJECT DESCRIPTION

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### 3.1 General Information

---

Yongli Biotechnology Co. Ltd. is a specialized industrial facility that produces high-quality protein powder derived from animal leather cuttings. Strategically located in Takshur, Mirzanagar, Ashulia, Savar, Dhaka, the factory is designed to meet the growing demand for sustainable and efficient utilization of leather by-products.

Led by entrepreneur Mr. Lu Chengyi, the factory is equipped with modern processing technology to ensure optimal efficiency and product quality. With an annual production capacity of 5,000 metric tons, the facility plays a key role in resource optimization within the leather industry. In addition to producing protein powder, the factory contributes to the leather-finishing sector by repurposing processed leather for softening and polishing.

Geographically, the project is between **23°57'47.8"N & 90°17'01.3"E**. The total area of the proposed project will be **33418 Square feet (as per the fire service license)**.

**Yongli Biotechnology Co., Ltd. (Industrial Protein Powder from Tannery Waste)** proposed establishing this project. According to the ECR 2023, the project is categorized as **RED** under **Schedule 1, Serial Number 69**; therefore, it requires an EIA study for its Site Clearance Certificate. This EIA report for this project is in accordance with the DoE guidelines. Accordingly, this EIA report has been prepared.

### 3.2 Necessity of the Project, Reasons for Setup, and Benefits

---

The proposed project, Yongli Biotechnology Co. Ltd., has been developed in response to critical environmental, industrial, and economic needs in Bangladesh's leather sector. The project aims to establish a sustainable, technologically advanced facility to produce industrial protein powder from animal leather waste, thereby addressing multiple challenges associated with waste management and resource utilization.

#### 3.2.1 Management of Leather Waste

The leather industry in Bangladesh, particularly in the Savar region, generates substantial quantities of solid waste, including trimmings, shaving dust, and cuttings. A significant portion of this waste remains underutilized or improperly disposed of, leading to:

- Soil contamination due to the accumulation of organic and chemical residues
- Groundwater pollution from leachate containing chromium and other hazardous substances
- Odor and public health concerns in surrounding communities

The proposed project is necessary to provide a systematic and environmentally sound solution for the utilization of such waste by converting it into value-added industrial products.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 3.2.2 Environmental Protection and Pollution Reduction

Improper disposal of leather waste contributes to long-term environmental degradation. The necessity of this project lies in its ability to:

- Reduce the volume of waste sent to landfills
- Minimize environmental pollution load from the leather sector
- Promote cleaner production practices

By integrating waste utilization with pollution control measures, the project supports national goals for environmental sustainability.

## 3.2.3 Growing Demand for Industrial Protein Products

Industrial protein powder has increasing demand in sectors such as:

- Animal feed and poultry industries
- Adhesives and chemical manufacturing
- Fertilizer and agro-based industries

Currently, a portion of this demand is met through imports or limited local production. The project is necessary to bridge this demand-supply gap through local, sustainable production.

## 3.2.4 Alignment with National and Global Sustainability Goals

The project aligns with:

- National policies on waste minimization and resource recovery
- Principles of the circular economy
- Sustainable Development Goals (SDGs), particularly those related to responsible consumption and production (SDG 12) and industry, innovation, and infrastructure (SDG 9)

## 3.3 Reasons for the Setup of the Project

---

### 3.3.1 Strategic Location Advantage

The project is located in Ashulia, Savar, Dhaka, which is in close proximity to the tannery industrial zone. This location provides:

- Easy access to abundant raw materials (leather waste)
- Reduced transportation cost and logistical efficiency
- Availability of industrial infrastructure and utilities

### 3.3.2 Availability of Proven Technology

The production process utilizes established and reliable technologies, including hydrolysis, dechromisation, and spray drying. These technologies ensure:

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- Efficient conversion of waste into usable protein products
- Compliance with environmental standards
- Consistent product quality

### **3.3.3 Economic Viability**

The project is economically justified due to:

- Low-cost and readily available raw materials
- High market value of finished products
- Potential for both domestic sales and export opportunities
- Favorable return on investment (ROI)

### **3.3.4 Regulatory Compliance and Environmental Management**

The project has been designed in accordance with Environmental Conservation Rules (ECR), 2023, and includes:

- Installation of a 150 m<sup>3</sup>/day Effluent Treatment Plant (ETP) for treatment
- Air pollution control systems and proper solid waste management
- Adoption of environmentally sound operational practices

These measures ensure that the project can operate within the regulatory framework while minimizing environmental risks.

## **3.4 Benefits of the Project**

---

### **3.4.1 Environmental Benefits**

- Significant reduction in leather waste disposal
- Lower risk of soil and water contamination
- Promotion of waste-to-resource conversion
- Contribution to pollution control and cleaner environment

### **3.4.2 Economic Benefits**

- Creation of direct and indirect employment opportunities
- Development of supporting industries (transport, supply chain, maintenance)
- Generation of revenue through value-added products
- Reduction of dependency on imported protein-based industrial inputs

### **3.4.3 Industrial Benefits**

- Strengthening of the leather and allied industries through integrated waste utilization
- Improvement in resource efficiency and productivity
- Enhancement of Bangladesh's position in sustainable industrial practices

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 3.4.4 Social Benefits

- Improvement of local environmental conditions, reducing health risks
- Increased income opportunities for local communities
- Development of technical skills among workers

## 3.4.5 Technological Advancement

- Introduction of modern processing technologies in waste utilization
- Promotion of innovation in industrial by-product management
- Encouragement for future investments in green and sustainable industries

The establishment of Yongli Biotechnology Co. Ltd. is justified by its strong alignment with environmental, economic, and industrial priorities. The project addresses the pressing need for effective leather waste management, while simultaneously creating economic value and employment opportunities.

Through the adoption of sustainable technologies and environmental safeguards, the project represents a forward-looking initiative that contributes to circular economy development and long-term industrial sustainability in Bangladesh.

## Project Inputs

The key inputs required for project implementation include:

Input Category	Details
Land	Land acquisition
Human Resources	Recruitment of project manpower
Equipment & Furniture	Procurement of medical and surgical equipment, furniture, and fixtures
Financing	Allocation of project funds

## 3.5 Water Body Environmental Conservation Measures (Present Scenario and Post-Project Scenario)

The conservation of surrounding water bodies is a critical environmental consideration for the proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project**, given the nature of the raw materials, processing operations, and the proximity to a government khal near the project site. This section presents the existing water body condition, anticipated post-project conditions, and proposed conservation and protection measures.

### 3.5.1 Present Scenario

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

At present, the project area is located in an industrial environment in Takshur, Mirzanagar, Ashulia, Savar, Dhaka, where a combination of industrial establishments, drainage channels, and nearby water bodies is present. A **government khal** is located adjacent to the project area and functions as a local drainage and stormwater receiving body.

Within the same industrial boundary, an **existing tannery waste-processing industry (gelatin manufacturing plant) is currently operating and has previously undergone a DoE-approved EIA assessment**. Therefore, the surrounding water environment has already been evaluated under industrial operational conditions.

The existing water body scenario can be summarized as follows:

- Presence of **government khal/drainage channel** serving regional runoff and stormwater conveyance.
- Existing industrial activities contribute to increased sensitivity of nearby surface water resources.
- Potential risk of contamination exists from industrial runoff, sediment transport, accidental spills, and improper waste handling.
- Seasonal monsoon rainfall may increase runoff load and temporarily affect drainage capacity.
- Groundwater in the area is utilized mainly through **deep tube-well abstraction** for industrial and domestic purposes.

At present, no major ecological waterbody, wetland reserve, protected aquatic habitat, or declared environmentally critical area (ECA) has been identified immediately adjacent to the proposed facility.

### 3.5.2 Post-Project Scenario

After establishment and operation of the proposed project, wastewater will be generated mainly from:

- Washing section
- Hydrolysis process
- Filtration section
- Dechromisation section
- Floor cleaning and utility operations

If improperly managed, these streams could potentially contain:

- High organic loading (BOD/COD)
- Suspended solids
- Trace chromium and chemical residues

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Variable pH
- Fine particulate matter

However, the proposed project incorporates a **150 m<sup>3</sup>/day Effluent Treatment Plant (ETP)** and a Zero Liquid Discharge (ZLD) Program, ensuring that wastewater generated by the industrial process is **treated, recovered, and reused within the facility**.

Therefore, under the proposed operational arrangement:

- No untreated wastewater will be discharged to the government khal.
- Direct contamination of nearby surface water bodies is not anticipated.
- Water reuse practices will significantly reduce freshwater abstraction.
- Surface water quality protection will be strengthened through engineering and management controls.

### 3.5.3 Water Body Conservation Measures

To ensure protection of nearby surface and groundwater resources, the following measures will be implemented:

#### A. Wastewater Treatment and ZLD Implementation

The project will operate a **150 m<sup>3</sup>/day Physico-Chemical and Biological ETP** integrated with a **Zero Liquid Discharge (ZLD) system**.

The treatment train will include:

- Equalization tank
- pH correction
- Coagulation and flocculation
- Biological treatment
- Clarification
- Sludge handling
- Water recovery system (ZLD)

Objectives include:

- Reduction of BOD, COD, TSS, and residual contaminants.
- Removal of trace chromium and processing chemicals.
- Prevention of pollutant release into external water bodies.

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- Maximum process water recovery and reuse.

## **B. Stormwater Management System**

Separate stormwater management measures will be implemented to prevent runoff contamination.

Measures include:

- Construction of **separate stormwater drainage lines**.
- Segregation of process wastewater and rainwater drainage.
- Periodic cleaning of internal drainage systems.
- Installation of catch pits and sediment traps where necessary.
- Controlled discharge of uncontaminated stormwater.

This will reduce sediment loading and protect the adjacent khal.

## **C. Chemical and Raw Material Storage Protection**

Improper chemical handling can affect surface water quality through accidental leakage.

To minimize this risk:

- Chemicals will be stored in designated covered storage areas.
- Impervious flooring and secondary containment will be provided.
- Spill prevention and emergency response procedures will be implemented.
- Raw tannery waste storage areas will remain covered and drained.

## **D. Sludge and Solid Waste Management**

Improper disposal of sludge can create leachate risks affecting groundwater and nearby drainage.

Therefore:

- ETP sludge will be dewatered and stored properly.
- Hazardous residues will be disposed of through approved channels.
- Solid waste segregation and controlled disposal will be maintained.

## **E. Groundwater Protection Measures**

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Groundwater protection will be ensured through:

- Impervious flooring in processing areas.
- Leak-proof chemical storage systems.
- Proper pipeline maintenance.
- Controlled wastewater handling.
- Periodic inspection of underground utilities.

## F. Water Quality Monitoring Program

A regular environmental monitoring program will be conducted.

Monitoring parameters may include:

Parameter	Monitoring Frequency
pH	Monthly
BOD	Monthly
COD	Monthly
TSS	Monthly
Chromium	Quarterly
Oil & Grease	Quarterly
Groundwater Quality	Half-yearly
Nearby Khal Water Quality	Half-yearly

Monitoring results will be compared with applicable **DoE environmental standards**.

### 3.5.4 Comparative Assessment: Present vs Post-Project Scenario

Component	Present Scenario	Post-Project Scenario
Water Management	Existing industrial environment	Improved engineered control system
Wastewater Control	Existing industry control system	Dedicated ETP + ZLD implementation
Surface Water Risk	Moderate industrial sensitivity	Controlled and minimized risk
Groundwater Protection	Existing condition	Enhanced protection measures
Water Reuse	Limited	Integrated reuse and recovery system
Environmental Compliance	Existing approved industry	Expanded compliance framework

The proposed project site is located within an already established industrial setting where industrial activity and environmental management practices are existing realities. With implementation of the **150 m<sup>3</sup>/day ETP, Zero Liquid Discharge Program**, stormwater segregation, sludge management, and continuous monitoring, the proposed project is not expected to cause significant adverse impacts on nearby water bodies, including the adjacent **government khal**.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Rather, the project is expected to strengthen water conservation and environmental management through improved treatment, reuse, and pollution-prevention measures that are consistent with DoE requirements and sustainable industrial practices.

Table 3-1 Physico-chemical parameter of the project site

Location	Depth (ft)	Tept. °C	pH	DO (ppm)	TDS g/l	Salinity g/L	EC dS/m	Turbidity FTU	BOD <sub>5</sub> (ppm)	COD (ppm)
L-1	2.5	28	9.90	1.00	1.09	1.30	2.58	22.11	190	182
L-2	2.5	31	9.97	1.40	1.16	1.25	2.71	10.43	148	172
L-3	2.5	27	10.25	3.14	0.85	1.06	2.86	7.66	83	148
L-4	2.5	26	10.31	2.04	1.07	1.25	2.49	26.19	78	122
L-5	2.5	26	10.05	2.36	0.92	1.02	2.08	7.98	79	122
L-6	2.5	27	9.74	2.32	0.79	0.82	1.64	5.74	76	122
L-7	2.5	27	9.55	2.32	0.71	0.76	1.52	16.45	78	122
L-8	2.5	28	9.67	2.35	0.66	0.85	1.70	8.25	79	122

The acidity or alkalinity of water is expressed as pH, a very important parameter for assessing water quality. The pH of the study area ranged from 8.59 to 10.46; the average value during the study period was above the standard permissible limit set by DoE, i.e., 6.5 to 8.5. The result revealed that the pH value decreased with distance up to sampling point 12 beside the residential area; then it increased again, reaching its highest value at sampling point 17, where some textile industries are located and discharge their untreated wastewater into the river stream. Some industries discharge high-pH effluents, and river flow is also low at the time of sampling, which is why the river water pH is high.

### 3.5.5 Environmental Conservation Measures During Construction Phase

During the construction phase of Yongli Biotechnology Co., Ltd. (Industrial Protein Powder from Tannery Waste), specific precautionary measures will be implemented to prevent adverse impacts on the nearby waterbody ecosystem. These measures include:

- **Erosion and Sediment Control:** Temporary drainage channels, silt traps, and sedimentation ponds will be installed to prevent soil erosion and sediment runoff from construction areas reaching nearby water bodies.
- **Proper Management of Construction Waste:** All construction debris, excavated soil, and waste materials will be collected and disposed of at designated locations to prevent contamination of surface water bodies.
- **Stormwater Management:** Temporary stormwater management systems will be developed to control runoff during heavy rainfall and reduce the risk of polluted runoff entering the water body.
- **Controlled Storage of Construction Materials:** Cement, chemicals, fuel, and other potentially hazardous materials will be stored in secured and covered areas to prevent accidental leakage into surrounding drainage systems.
- **Worker Awareness Programs:** Construction workers will be trained regarding environmental protection practices, particularly with respect to waste disposal and protection of nearby natural water bodies.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

These measures will be implemented throughout the construction period to ensure that project activities do not negatively affect the water body environment.

## 3.5.6 Post-Project Scenario (Operational Phase Conservation Measures)

After the project becomes operational, long-term environmental management strategies will be implemented to protect the surrounding water body ecosystem. These measures include:

- **Installation of Wastewater Treatment Systems:** All wastewater generated from the Industrial Protein Powder from Tannery Waste project, residential, and institutional activities will be treated through a properly designed Sewage Treatment Plant (STP) before discharge or reuse. This will prevent untreated effluent from reaching natural water bodies.
- **Medical Waste Management:** Hazardous and medical waste generated from the Industrial Protein Powder from Tannery Waste project will be managed through a regulated Industrial Protein Powder from Tannery Waste Management System in accordance with national regulations to avoid environmental contamination.
- **Solid Waste Management:** Segregation, collection, and proper disposal of municipal solid waste will be ensured through an organized waste management system.
- **Stormwater Drainage Management:** A well-designed drainage network will be constructed to channel rainwater safely without carrying pollutants into nearby water bodies.
- **Green Buffer Zones:** Landscaping and plantation of trees and vegetation within the project area will act as natural filters to reduce runoff, control soil erosion, and enhance ecological balance.
- **Environmental Monitoring:** Regular monitoring of water quality in nearby surface water bodies will be conducted to ensure that project operations do not degrade the water body ecosystem.
- **Public Awareness and Institutional Responsibility:** The Industrial Protein Powder from Tannery Waste project administration will adopt environmentally responsible operational practices and promote awareness among staff, students, and visitors regarding conservation of local water resources.

## 3.5.7 Long-Term Environmental Benefits

With proper implementation of these conservation measures, the project is expected not only to avoid adverse impacts but also to contribute positively to environmental protection in the surrounding area. The introduction of organized wastewater management, waste handling systems, and planned landscaping will help reduce uncontrolled pollution sources and support the sustainable conservation of nearby water bodies and aquatic ecosystems.

Overall, the project will follow environmentally responsible development practices to ensure that the natural water body in the Ashulia, Savar region remains protected both during the construction phase and throughout the facility's operational life.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 3.6 Potential Problems During Industrial Protein Powder from Tannery Waste Project Operation and Mitigation Measures

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The operation of the proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project** involves several industrial processes including **shredding, washing, hydrolysis, filtration, dechromisation, concentration, multi-effect evaporation, and spray drying**. Due to the nature of raw materials and chemical processing operations, several **environmental, operational, occupational, and community-related issues** may arise if appropriate management systems are not maintained.

This section identifies potential operational problems and corresponding mitigation measures to ensure environmentally sustainable and safe operation of the facility.

### 3.6.1 Environmental Problems and Mitigation Measures

#### A. Wastewater Generation and Water Pollution Risk

##### Potential Problem

Industrial wastewater will mainly be generated from:

- Washing section
- Hydrolysis section
- Filtration process
- Dechromisation process
- Floor washing and utility operations

The wastewater may contain:

- High BOD and COD
- Suspended solids
- Variable pH
- Residual chemicals
- Trace chromium and heavy metals
- Organic protein residues

If untreated or poorly managed, wastewater may cause:

- Surface water contamination
- Groundwater pollution
- Drainage blockage
- Soil quality degradation

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## Mitigation Measures

- Operate **150 m<sup>3</sup>/day ETP** continuously and efficiently.
- Maintain wastewater loading within operational design capacity.
- Implement **Zero Liquid Discharge (ZLD) system** for wastewater recovery and reuse.
- Conduct routine monitoring of:
  - pH
  - BOD
  - COD
  - TSS
  - Chromium
- Maintain separate stormwater and industrial drainage systems.
- Implement preventive maintenance for pumps, pipelines, and treatment units.

## B. Air Pollution and Odor Generation

### Potential Problem

Air emissions may occur from:

- Spray drying operation
- Multi-effect evaporator
- Boiler and diesel generator
- Handling of tannery waste raw materials

Potential pollutants include:

- Fine dust and particulate matter
- Combustion gases
- Odorous compounds
- Vapor emissions

Potential impacts:

- Localized air quality deterioration
- Worker respiratory discomfort
- Odor nuisance to nearby industries and communities

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## Mitigation Measures

- Install **bag filters/cyclone separators** in spray drying systems.
- Maintain adequate stack height for boiler and generator emissions.
- Use cleaner fuel and conduct periodic emission testing.
- Store raw tannery waste under **covered and ventilated conditions**.
- Minimize raw material storage duration through rapid processing.
- Implement housekeeping and odor control practices.

## C. Solid Waste and Sludge Management Problem

### Potential Problem

Operational activities may generate:

- Filtration residues
- Leather residues
- ETP sludge
- Chemical sludge
- Packaging waste
- ZLD residual solids

Improper disposal may lead to:

- Soil contamination
- Drain blockage
- Secondary pollution
- Leachate generation

### Mitigation Measures

- Segregate hazardous and non-hazardous wastes.
- Dewater ETP sludge using a filter press or sludge drying beds.
- Dispose of hazardous residues through authorized facilities.
- Recycle packaging materials wherever feasible.
- Maintain designated storage areas with impervious flooring.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## D. Chemical Handling and Spill Risk

### Potential Problem

The project involves handling of chemicals associated with:

- Hydrolysis
- pH adjustment
- Dechromisation
- Wastewater treatment

Improper handling may result in:

- Chemical leakage
- Occupational exposure
- Fire hazard
- Soil and water contamination

### Mitigation Measures

- Store chemicals in dedicated secured storage rooms.
- Provide spill containment systems.
- Install secondary containment and leak collection trays.
- Maintain updated Material Safety Data Sheets (MSDS).
- Conduct worker training on chemical handling procedures.
- Maintain emergency spill response kits.

## 3.6.2 Operational and Technical Problems

### A. Equipment Failure and Production Disruption

#### Potential Problem

Malfunction of major process equipment such as:

- Shredder
- Hydrolysis reactor
- Filtration unit
- Spray dryer
- Multi-effect evaporator

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- ETP system

May cause:

- Production interruption
- Environmental compliance failure
- Increased operational cost

## Mitigation Measures

- Implement preventive maintenance schedule.
- Maintain spare parts inventory.
- Conduct periodic inspection and calibration.
- Employ trained technical personnel.
- Establish equipment shutdown and emergency response protocols.

## B. Power Failure and Utility Interruption

### Potential Problem

Operational continuity depends on a stable electricity supply.

Power interruption may cause:

- Process interruption
- Wastewater treatment disruption
- Product quality issues
- Equipment damage

### Mitigation Measures

- Maintain a **500 KVA diesel generator backup**.
- Use automatic switching systems.
- Conduct regular generator testing and maintenance.

## 3.6.3 Occupational Health and Safety Problems

### A. Worker Exposure to Dust and Chemicals

#### Potential Problem

Workers may be exposed to:

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- Protein powder dust
- Chemical fumes
- Raw tannery waste
- Heat and humidity

Potential health effects include:

- Respiratory irritation
- Skin irritation
- Eye exposure
- Occupational illness

## **Mitigation Measures**

- Provide PPE:
  - Mask
  - Gloves
  - Goggles
  - Protective clothing
- Install ventilation and dust extraction systems.
- Conduct periodic medical examinations.
- Maintain worker hygiene facilities.

## **B. Noise and Heat Exposure**

### **Potential Problem**

Noise sources include:

- Shredder
- Pumps
- Compressors
- Dryer and blower systems

High-temperature zones may exist around:

- Boiler

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Spray dryer
- Evaporation unit

## Mitigation Measures

- Install acoustic enclosures.
- Provide ear protection devices.
- Maintain adequate ventilation and cooling.
- Rotate workers in high exposure zones.

### 3.6.4 Community and External Environmental Concerns

#### A. Traffic and Transportation Pressure

##### Potential Problem

Movement of:

- Raw material trucks
- Chemical supply vehicles
- Finished product transport vehicles

may increase:

- Traffic congestion
- Road safety risks
- Local dust generation

##### Mitigation Measures

- Implement traffic management plan.
- Schedule transportation during suitable hours.
- Maintain vehicle fitness and speed control.

#### B. Cumulative Environmental Concerns

##### Potential Problem

The proposed project is located within the same boundary as an **existing gelatin manufacturing facility**, approximately **200 feet away**, where tannery waste is processed into gelatin for capsule shell production.

Combined industrial activities may create cumulative concerns related to:

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Air emissions
- Wastewater generation
- Noise
- Utility demand
- Transportation movement

### Mitigation Measures

- Coordinate environmental management among facilities.
- Maintain integrated monitoring program.
- Ensure independent treatment and pollution control systems.
- Conduct periodic environmental performance review.

Table 3-2 Potential Problems and Mitigation Measures

Potential Problem	Possible Impact	Mitigation Measure
Wastewater Generation	Water pollution	150 m <sup>3</sup> /day ETP + ZLD
Air Emission	Dust, odor	Bag filter, stack, housekeeping
Chemical Handling	Spill risk	Safe storage + spill control
Solid Waste	Soil contamination	Segregation and authorized disposal
Equipment Failure	Operational disruption	Preventive maintenance
Power Failure	Treatment interruption	Generator backup
Worker Exposure	Health risk	PPE + ventilation
Noise & Heat	Occupational stress	Acoustic control + cooling
Traffic Increase	Safety issue	Traffic management plan
Cumulative Impact	Combined industrial pressure	Coordinated environmental monitoring

The operational phase of the proposed **Industrial Protein Powder from Tannery Waste Project** involves several environmental, technical, and occupational challenges associated with tannery waste processing and industrial manufacturing operations. However, through implementation of **150 m<sup>3</sup>/day ETP, ZLD program**, proper air pollution control, chemical management, occupational safety practices, and coordinated environmental monitoring considering the nearby existing gelatin facility, the identified risks can be effectively controlled.

Therefore, the project is considered **environmentally manageable, technically feasible, and operationally sustainable** under proper implementation of the proposed mitigation measures.

### 3.6.5 Fire Hazards and Emergency Risks

#### Potential Problems

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Industrial Protein Powder from Tannery Waste projects contains flammable materials, electrical equipment, and chemicals that may pose fire hazards if proper safety measures are not followed. Fire incidents in Industrial Protein Powder from Tannery Waste projects can be extremely dangerous due to the presence of patients with limited mobility.

## Mitigation Measures

- Installation of a **modern fire detection and fire suppression system**, including smoke detectors, alarms, fire extinguishers, hydrants, and sprinkler systems.
- Compliance with **Bangladesh National Building Code (BNBC) fire safety regulations**.
- Preparation and implementation of an **Emergency Response and Fire Management Plan**.
- Conducting **regular fire drills and emergency training** for Industrial Protein Powder from the Tannery Waste project staff.
- Ensuring safe storage and handling of medical gases and chemicals.

### 3.6.6 Public Health and Occupational Health Risks

#### Potential Problems

Workers may be exposed to biological, infectious diseases, chemicals, radiation, and other occupational risks if safety measures are not properly maintained.

#### Mitigation Measures

- Implementation of a **comprehensive Occupational Health and Safety (OHS) program**.
- Provision of **personal protective equipment (PPE)** for healthcare workers and support staff.
- Adoption of strict **infection prevention and control protocols** within Industrial Protein Powder from Tannery Waste project facilities.
- Regular health checkups and vaccination programs for healthcare workers.
- Establishment of **safe laboratory and radiation safety procedures**.

### 3.6.7 Pressure on Local Utilities and Infrastructure

#### Potential Problems

Large institutional facilities, such as Industrial Protein Powder from Tannery Waste projects, may place additional pressure on local infrastructure, including water supply, electricity, waste management, and transportation systems.

#### Mitigation Measures

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Efficient **water conservation measures**, including reuse of treated wastewater.
- Installation of **backup power systems and energy-efficient equipment**.
- Implementation of organized waste management systems within the Industrial Protein Powder from Tannery Waste project.
- Development of internal infrastructure that minimizes dependence on external resources.

### 3.7 Present Condition of the Project Site and Expected Condition After Establishment of the Industrial Protein Powder from Tannery Waste Project

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The proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project** is planned to be established at **Takshur, Mirzanagar, Ashulia, Savar, Dhaka**, within an existing industrial setting. The assessment of the **present and anticipated post-project conditions is important for understanding the environmental, physical, and socio-economic transformations** associated with project implementation.

#### 3.7.1 Present Condition of the Project Site

The project site is located in a predominantly **industrialized area of Ashulia–Savar**, where manufacturing, textile, chemical, engineering, and allied industrial activities are already present.

A significant consideration for this project is that **an existing tannery waste processing industry already operates within the same project boundary**, approximately **200 feet from the proposed facility**. The existing industry converts **tannery waste into gelatin**, which is subsequently used in **pharmaceutical capsule shell manufacturing**. The existing facility had previously undergone an **Environmental Impact Assessment (EIA)** and received **approval from the Department of Environment (DoE)**.

Therefore, the project area cannot be considered a completely undeveloped or environmentally sensitive greenfield location; rather, it represents an **existing industrial operational environment**.

The present site condition is summarized below:

#### A. Land Use Condition

Presently, the proposed project location is characterized by:

- Existing industrial land use.
- Developed industrial infrastructure within the surrounding area.
- Availability of internal access roads and utility connectivity.
- Presence of adjacent industrial establishments.

The proposed project shed area is presently either **vacant, partially developed, or designated for industrial expansion purposes**.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

No protected forest, agricultural reserve, ecological reserve, or environmentally critical area has been identified immediately adjacent to the project footprint.

## B. Existing Industrial Environment

The surrounding environment already exhibits characteristics of industrial activity, including:

- Existing industrial buildings and processing units.
- Moderate industrial traffic movement.
- Utility infrastructure (electricity, roads, drainage, water supply).
- Existing operational environmental management practices.

The nearby **gelatin manufacturing facility demonstrates the location's prior compatibility with tannery waste-based industrial processing operations.**

## C. Surface Water and Drainage Condition

The project area contains nearby drainage infrastructure including a **government khal**, which functions as:

- Local stormwater conveyance channel.
- Surface runoff drainage receiver.

Seasonal rainfall may temporarily influence local drainage conditions.

At present:

- Industrial runoff management exists within the industrial area.
- Water bodies remain environmentally sensitive receptors requiring protection.
- Surface water quality may be influenced by regional industrial activities.

## D. Air Quality Condition

Current ambient air quality reflects a typical industrial environment.

Existing contributing sources include:

- Vehicular movement.
- Nearby industrial operations.
- Roadside dust.
- Generator and industrial utility emissions.

Air quality may periodically experience localized increases in:

- Dust concentration.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Combustion emissions.
- Industrial odor.

## E. Soil and Groundwater Condition

The present soil condition is generally stable and suitable for industrial development.

Groundwater is commonly used in the area through:

- Deep tube-wells.
- Industrial abstraction systems.

Potential environmental sensitivity remains associated with:

- Chemical handling.
- Waste storage.
- Industrial wastewater management.

## F. Socio-economic Condition

The surrounding area possesses an active industrial workforce and service economy.

Current socio-economic characteristics include:

- Availability of skilled and semi-skilled labor.
- Existing transport and supply chain activities.
- Industrial employment dependence.
- Commercial and support service activities.

### 3.7.2 Expected Condition After Project Establishment

Following establishment and operation of the proposed **Industrial Protein Powder from Tannery Waste Project**, changes in the environmental and operational condition of the project site are anticipated.

These changes are expected to be both **positive and manageable**, provided proper mitigation measures and environmental controls are maintained.

#### A. Improved Industrial Resource Utilization

The proposed project will establish an additional **value-added tannery waste utilization system** within the industrial boundary.

After project implementation:

- Tannery waste utilization efficiency will increase.

## **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- Additional waste diversion from disposal pathways will occur.
- Resource recovery and circular economy practices will be strengthened.

The project will complement the nearby **existing gelatin facility**, where:

- Existing industry → tannery waste to gelatin.
- Proposed project → tannery waste to industrial protein powder for leather softening and polishing applications.

This creates a broader industrial resource recovery framework.

### **B. Enhanced Environmental Management System**

The proposed facility will implement modern environmental management measures including:

- **150 m<sup>3</sup>/day Effluent Treatment Plant (ETP).**
- **Zero Liquid Discharge (ZLD) system.**
- Air pollution control devices.
- Controlled chemical storage systems.
- Sludge management procedures.
- Environmental monitoring program.

Compared with the present scenario, post-project operation is expected to provide:

- Improved wastewater control.
- Enhanced pollution prevention.
- Better environmental compliance mechanisms.

### **C. Water Environment Condition**

Under operational conditions, wastewater will be generated from:

- Washing process.
- Hydrolysis process.
- Filtration section.
- Dechromisation section.

However:

- All industrial wastewater will be treated through the **150 m<sup>3</sup>/day ETP.**
- ZLD implementation will maximize recovery and reuse.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- No untreated industrial discharge is anticipated into the nearby **government khal**.

Consequently, post-project water management is expected to remain environmentally controlled.

## D. Air Environment Condition

After project commissioning, new emission sources may include:

- Spray drying system.
- Boiler operation.
- Generator operation.
- Raw material handling.

Potential impacts may include:

- Dust generation.
- Odor.
- Combustion emissions.

However, implementation of:

- Bag filters.
- Adequate stack systems.
- Covered storage.
- Good housekeeping.

will significantly reduce environmental impacts.

## E. Physical Infrastructure Improvement

Project establishment will improve the physical condition of the site through:

- Development of industrial shed.
- Internal drainage system.
- Utility integration.
- Organized material handling area.
- Safety infrastructure.
- Waste storage and treatment facilities.

Overall site management and environmental control are expected to improve compared with the existing undeveloped/expansion condition.

## F. Socio-economic Improvement

Expected socio-economic benefits include:

- Additional employment opportunities.
- Increased local economic activity.
- Growth of transport and service sectors.
- Technical capacity enhancement.
- Industrial investment strengthening.

Table 3-3 Comparative Assessment: Present vs Expected Condition

Environmental Component	Present Condition	Expected Condition After Project Establishment
Land Use	Existing industrial environment	Expanded organized industrial development

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Industrial Activity	Existing gelatin manufacturing facility	Integrated tannery waste utilization cluster
Water Management	Existing industrial control measures	ETP + ZLD based improved control
Air Quality	Existing industrial emissions	Controlled emissions with mitigation systems
Waste Management	Existing industrial practices	Enhanced waste segregation and treatment
Drainage & Surface Water	Moderate environmental sensitivity	Controlled wastewater management
Infrastructure	Existing utilities available	Improved infrastructure and safety systems
Employment	Existing industrial workforce	Increased employment and economic activity

The present condition of the project site reflects an **existing industrial environment already compatible with tannery waste processing operations**, supported by the presence of a **DoE-approved gelatin manufacturing facility within the same boundary**.

The establishment of the proposed **Industrial Protein Powder from Tannery Waste Project** is expected to strengthen industrial resource utilization, environmental management, and socio-economic development while maintaining environmental protection through implementation of **ETP, ZLD, pollution control systems, and regulatory compliance measures**.

Accordingly, the post-project scenario is expected to remain **environmentally manageable, industrially compatible, and operationally sustainable**.

### 3.8 Basic Information

The basic data of **Yongli Biotechnology Co., Ltd. (Industrial Protein Powder from Tannery Waste)** is furnished in the table below.

The proposed project, Yongli Biotechnology Co. Ltd. (Industrial Protein Powder from Tannery Waste), is a **leather industry byproduct in an efficient manner** located at Takshur, Mirzanagar,, Ashulia, Savar.

**The proposed project shall not be contrary to any development plan, policy, or decision of the Government.**

### 3.9 Basic Data of the proposed project

Table 3-4 Basic Project Information

Sl. No.	Particulars	Details
1	Project Name	Yongli Biotechnology Co. Ltd.

**Environmental Impact Assessment (EIA) of  
Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery  
Waste)**

2	<b>Project Type</b>	<b>Industrial Protein Powder Manufacturing from Tannery Leather Waste</b> (Tannery Waste to Value-Added Industrial Product)
3	<b>Project Category</b>	Schedule-1, <b>Red Category</b> , Serial No. 8 (as per ECR 2023)
4	<b>Name of the Entrepreneur</b>	<b>Mr. Lu Chengyi</b>
5	<b>Designation of Entrepreneur</b>	Chairman
6	<b>Project Location</b>	Takshur, Mirzanagar, Ashulia, Savar, Dhaka
7	<b>Head Office Address</b>	Takshur, Mirzanagar, Ashulia, Savar, Dhaka
8	<b>Project Area</b>	Approx. <b>33,418 sq.ft.</b> (as per Fire Service License)
9	<b>Project Cost</b>	Approx. <b>BDT 94,480,000</b> (as per BIDA/MOA)
10	<b>Nature of Project</b>	Proposed industrial unit for production of <b>Industrial Protein Powder from Tannery Leather Waste</b> to be used as <b>leather softener and polishing agent</b>
11	<b>Existing Industrial Context</b>	An existing <b>DoE-approved gelatin manufacturing factory</b> is located within the same industrial boundary. The existing facility converts tannery waste into <b>gelatin for pharmaceutical capsule shell production</b> . The proposed project will be established approximately <b>200 ft from the existing facility</b> .
12	<b>Final Product</b>	Industrial Protein Powder
13	<b>Application of Product</b>	Leather softening, leather polishing, and allied leather finishing applications
14	<b>Raw Material</b>	Tannery Leather Waste / Leather Cutting Waste
15	<b>Production Capacity</b>	<b>5,000 Metric Tons per Year (MT/year)</b>
16	<b>Daily Production Capacity</b>	Approx. <b>16.67 MT/day (~17 MT/day)</b> based on 300 operating days/year
17	<b>Production Process</b>	Shredding → Washing → Hydrolysis → Filtration → Dechromisation → Concentration → Multi-Effect Evaporation → Spray Drying → Finished Protein Powder
18	<b>Power Requirement</b>	Approx. <b>800 kW</b> (Supply from REB)
19	<b>Fuel Requirement</b>	Approx. <b>100–150 liters diesel/day</b>

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20	<b>Water Requirement</b>	Approx. <b>155 m<sup>3</sup>/day</b>
21	<b>Raw Water Source</b>	Own Deep Tube Well
22	<b>Submersible Pump</b>	2 Nos. Pumps
23	<b>Industrial Wastewater Generation</b>	Generated mainly from <b>Washing, Hydrolysis, Filtration, and Dechromisation Sections</b>
24	<b>Wastewater Quantity</b>	Approx. <b>130 m<sup>3</sup>/day</b> (within ETP operational design limit with 10% freeboard consideration)
25	<b>ETP Capacity</b>	<b>150 m<sup>3</sup>/day (≈7 m<sup>3</sup>/hour)</b>
26	<b>ETP Type</b>	<b>Physico-Chemical + Biological Treatment System</b> integrated with <b>Zero Liquid Discharge (ZLD) Program</b>
27	<b>Wastewater Management Strategy</b>	Wastewater treatment through <b>ETP + ZLD (RO + Evaporation based recovery/reuse system)</b>
28	<b>Solid Waste Generation</b>	Filter cake, ETP sludge, packaging waste, leather residue, carton, plastic containers
29	<b>Solid Waste Management</b>	Segregation, recycling, sludge dewatering, authorized disposal
30	<b>Manpower Requirement</b>	Approx. <b>100–120 persons</b>
31	<b>Factory Operation Schedule</b>	<b>3 Shifts, 6 Days per Week</b>
32	<b>Generator Capacity</b>	<b>500 KVA Diesel Generator</b>
33	<b>Machinery / Major Equipment</b>	Shredder, Washing Unit, Hydrolysis Reactor, Filtration Unit, Dechromisation Unit, Concentration System, Multi-Effect Evaporator (MEE), Spray Dryer (1300 kg/hr), ETP & ZLD System
34	<b>GPS Location</b>	<b>23°57'47.8"N, 90°17'01.3"E</b>
35	<b>Surrounding Environment / Boundary Condition</b>	<b>North:</b> Vacant land (~250 m), Kaizen Metal Industries Bd. Ltd., Dhaka-Aricha Highway <b>South:</b> Khal, Nabinogor Textile Ltd., Aaron Denim Ltd., Uzzal Fabrics Ltd. <b>East:</b> Berger Becker Bangladesh Ltd. <b>West:</b> Vacant Area, Semi-Pacca Road, Local Settlement
36	<b>Liquefaction Consideration</b>	Site falls within <b>moderate seismic sensitivity zone</b> ; structural design will follow BNBC provisions

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

37	<b>Process Flow Diagram</b>	<b>Raw Material (Tannery Leather Waste) → Shredding → Washing → Hydrolysis → Filtration → Dechromisation → Concentration → Multi-Effect Evaporation → Spray Drying (1300 kg/hr) → Finished Product: Industrial Protein Powder</b>
38	<b>Responsible Contact Person</b>	<b>Mr. Parvez</b>
39	<b>Designation of Contact Person</b>	Project Coordinator
40	<b>Contact Number</b>	<b>+880 1779 068605</b>
41	<b>Nearby Receiving Water Body / Drainage</b>	Government Khal
42	<b>Environmental Compliance Context</b>	Proposed facility is adjacent to an <b>existing DoE-approved tannery waste processing industry</b> operating within the same boundary; environmental compatibility and industrial suitability already established for similar feedstock handling.

### 3.9.1 Project Area

Sl. No.	Division	District	Upazila / City Corporation / Municipality	Total land
1	Dhaka	Ashulia, Savar	Ashulia, Savar Sadar Municipality	33418 Square feet (as per fire service license)

### 3.9.2 Justification for Selection of Project Area

The selection of the project location for **Yongli Biotechnology Co. Ltd.**, situated in Takshur, Mirzanagar, Ashulia, Savar, Dhaka, has been based on a comprehensive evaluation of **technical, environmental, economic, and infrastructural factors**. The chosen site is considered highly suitable for the establishment of an **industrial protein powder manufacturing plant from tannery waste**, as justified below:

#### 1. Proximity to Raw Material Sources

The project area is located near the **Savar tannery industrial zone**, which is the primary hub of leather processing industries in Bangladesh. A significant quantity of **leather cutting waste, trimmings, and shavings** is generated daily in this region.

- Ensures **continuous and reliable supply of raw materials**
- Reduces **transportation cost and time**
- Minimizes environmental risks associated with long-distance waste transport

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

This proximity is a key factor supporting the **technical and economic feasibility** of the project.

## 2. Industrial Zoning and Land Suitability

The selected site falls within an **established industrial area**, making it appropriate for such type of manufacturing activity.

- Land is **designated for industrial use**, complying with land use regulations
- Avoids conflict with **residential or sensitive zones** (e.g., schools, hospitals)
- Suitable topography and soil conditions for construction and operation

Thus, the site ensures **regulatory compliance and land-use compatibility**.

## 3. Availability of Infrastructure and Utilities

The project area is well-supported by essential infrastructure required for industrial operations:

- **Road Connectivity:** **ମହତ୍ତ୍ୱ** access for transportation of raw materials and finished products
- **Electricity Supply:** Reliable power source for continuous operation of machinery
- **Water Supply:** Adequate water availability for processing and utility purposes
- **Drainage System:** Existing drainage network to support wastewater management

These facilities reduce the need for additional investment and enhance **operational efficiency**.

## 4. Environmental Considerations

The selection of the site has taken into account key environmental aspects:

- Located in an **industrial cluster**, thereby limiting additional environmental burden on new areas
- Availability of space for installation of **environmental control systems**, including a **150 m<sup>3</sup>/day ETP** for borjo pani treatment
- Reduced risk of environmental impact on ecologically sensitive areas such as forests, wetlands, or protected zones

Furthermore, the project contributes to **environmental improvement** by utilizing leather waste that might otherwise cause pollution.

## 5. Compatibility with Existing Industrial Activities

The presence of a **similar industrial protein processing facility nearby** indicates that the area is already compatible with such operations.

- Facilitates **industrial synergy and shared logistics**
- Indicates prior acceptance of similar activities from a regulatory perspective

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Supports development of a **specialized industrial cluster**

This compatibility reduces potential **land-use conflicts and environmental concerns**.

### 6. Economic and Logistical Advantages

- Reduced **raw material procurement cost** due to nearby sources
- Lower **transportation and handling expenses**
- Access to **local labor market**, including skilled and semi-skilled workers
- Proximity to major markets in **Dhaka and surrounding regions**

These factors contribute to the **overall economic viability** of the project.

### 7. Compliance with Regulatory Requirements

The selected site allows for compliance with **Environmental Conservation Rules (ECR), 2023** and other relevant national regulations:

- Adequate space for **installation of pollution control measures**
- Feasibility of implementing **Environmental Management Plan (EMP)**
- Suitable for obtaining environmental clearance from the **Department of Environment (DoE)**

The selection of **Takshur, Mirzanagar, Ashulia, Savar, and Dhaka** as the project sites is **justified by their strategic location, availability of raw materials, developed infrastructure, environmental suitability, and economic advantages**.

The site not only supports the **project's technical and financial feasibility** but also ensures **environmental compliance and sustainability**. Therefore, the chosen location is considered **optimal and appropriate** for establishing the proposed industrial protein powder manufacturing facility.

**Project Start Date (Planned):** 01 October 2026

### 3.10 Proposed Project Management Structure

Table 3-5 Project Management and Implementation Arrangement

Item	Description
Project Office	A temporary Project Office will be established at the project site.
Project Director (PD)	One full-time Project Director will be appointed for overall project management and coordination.
Deputy Project Director (DPD)	One Deputy Project Director will be deputed to assist the PD.
Core Project Staff	One Accountant and one Computer Operator will be appointed directly for the duration of the project.

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Outsourced Staff	One Diploma Engineer (Civil) and one Office Support Staff will be engaged on an outsourcing basis.
Procurement Consultant	One Procurement Consultant will be appointed at the end of the third year of project implementation to ensure efficient procurement and will report directly to the PD.
Technical Consultant	One Consultant of Executive Engineer / Senior Assistant Architect rank will be attached to the Project Office for technical supervision.
Project Implementation Committee (PIC)	A PIC will be formed to monitor implementation progress and provide operational guidance.
Project Steering Committee (PSC)	A PSC will oversee policy-level guidance and strategic decision-making.
Monitoring Mechanism	PIC and PSC will meet quarterly; IMED will inspect project progress to ensure proper implementation.

### 3.10.1 Alternative Arrangement (If Revenue Transfer Not Required)

Item	Status
Requirement for Alternative Arrangement	Not Applicable

### 3.10.2 Environmental Monitoring Plan

Parameter	Location	Frequency	Method	Responsibility
Flow (Inlet & Outlet)	ETP inlet/outlet	Continuous	Flow meter	ETP operator
pH, TSS, BOD, COD	ETP inlet/outlet	Daily	Laboratory	Environment Chemist
Color, TDS	ETP outlet	Weekly	Spectrophotometer	QA Lab
Noise Level	Near ETP & dyeing	Quarterly	Sound meter	HSE Officer
Sludge Quantity	Sludge drying bed	Monthly	Volume measurement	ETP Supervisor

### 3.11 Location map of the project:

The project will be developed at Takshur, Mirzanagar, Ashulia, Savar, Dhaka, 22°39'05.0 N & 92°09'56.1 E. This project will be rich in natural variety. Ashulia, Savar, Yongli Biotechnology Co. Ltd., & Industrial Protein Powder from Tannery Waste project. The developing authority will develop it totally in a planned way. A well-planned road network will be designed to improve transportation in the project area, enabling people to move easily throughout Bangladesh.

The project will be developed at Takshur, Mirzanagar, Ashulia, Savar, Dhaka. The area is a mixed commercial area, and a wide road and highway connect the project. This project will be rich through natural variety. Yongli Biotechnology Co. Ltd. It will be developed totally in a planned way by the developing authority. A well-planned road network will be designed to ensure a better transportation network in the project area so that people can move easily in every part of Bangladesh.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)



Figure 3-1 west side of the project

**Environmental Impact Assessment (EIA) of  
Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery  
Waste)**



Figure 3-2 Est Side of the project



Figure 3-3 South Side of the project

**Environmental Impact Assessment (EIA) of  
Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery  
Waste)**



Figure 3-4 North side of the project



Figure 3-5 Drainage Line towards ETP

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)



Figure 3-6 Discharge Point (govt khal)

## Surroundings of the project;

Table 3-6 Description of the Project Area within a 1 km Radius

Sl. No.	Environmental / Site Component	Description within 1 km Radius
1	<b>General Area Characteristics</b>	The project area falls within the <b>Ashulia–Savar industrial corridor</b> , characterized by industrial establishments, transportation infrastructure, drainage systems, commercial activities, and scattered residential settlements.
2	<b>Land Use Pattern</b>	The dominant land use within the 1 km radius is <b>industrial and mixed-use development</b> including factories, warehouses, roads, drainage systems, commercial establishments, vacant land, and limited residential settlements.
3	<b>Existing Industrial Environment</b>	The surrounding environment consists of <b>textile, engineering, chemical, coating, and allied manufacturing industries</b> . An <b>existing DoE-approved gelatin manufacturing facility</b> is located within the same

**Environmental Impact Assessment (EIA) of  
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		project boundary, approximately <b>200 feet from the proposed project</b> , converting tannery waste into gelatin for pharmaceutical capsule shell production.
4	<b>Compatibility of Proposed Project</b>	The proposed project is compatible with the surrounding industrial setting because it will process <b>tannery waste into industrial protein powder for leather softening and polishing applications</b> , representing a similar industrial feedstock utilization activity.
5	<b>Transportation and Road Network</b>	The area is connected through <b>semi-pacca roads, industrial access roads, local connecting roads</b> , and has proximity to the <b>Dhaka–Aricha Highway</b> , facilitating transportation of raw materials, products, manpower, and industrial logistics.
6	<b>Surface Water Bodies and Drainage</b>	A nearby <b>Government Khal</b> serves as local stormwater drainage and runoff conveyance channel. Surface drainage networks are present within the industrial zone and become more active during monsoon seasons.
7	<b>Air Environment</b>	Ambient air quality reflects a typical industrial environment influenced by <b>industrial activities, vehicular movement, generators, roadside dust, and utility operations</b> . Moderate industrial air emissions already exist within the area.
8	<b>Soil Condition and Topography</b>	The project area is situated on generally <b>flat terrain</b> typical of central Bangladesh. Soil conditions are considered suitable for industrial development, with no significant slope instability or landslide risk identified within the 1 km radius.
9	<b>Groundwater Environment</b>	Groundwater is widely used through <b>deep tube-wells</b> for industrial and domestic purposes. Groundwater remains an environmentally sensitive component requiring proper wastewater and chemical management.
10	<b>Ecological Environment</b>	Ecological sensitivity within the 1 km study area is relatively <b>low to moderate</b> , characterized by scattered roadside vegetation, shrubs, limited tree cover, and absence of protected forests, wildlife sanctuaries, or environmentally critical areas.
11	<b>Socio-economic Environment</b>	The surrounding area supports a strong <b>industrial labor force</b> , commercial establishments, transport activities, and service providers. The local economy is significantly influenced by industrial employment and manufacturing activities.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

12	<b>Sensitive Environmental Receptors</b>	Potential receptors include <b>nearby industries, drainage channels (government khal), roads, workers, and scattered residential settlements</b> . No major ecological reserve, protected wetland, archaeological site, or national park has been identified within the immediate influence zone.
13	<b>Utility Infrastructure</b>	The area has access to <b>electricity supply, transportation connectivity, water supply systems, industrial drainage facilities, and communication networks</b> , supporting industrial operations.
14	<b>Environmental Management Context</b>	The existing industrial environment already operates under environmental regulatory oversight. The proposed project will incorporate <b>150 m<sup>3</sup>/day ETP, Zero Liquid Discharge (ZLD), air pollution control systems, drainage management, and environmental monitoring measures</b> .
15	<b>Overall Environmental Characterization of 1 km Radius</b>	The 1 km project influence area can be characterized as an <b>established industrial environment with moderate environmental sensitivity</b> , suitable for compatible industrial development and tannery waste resource utilization activities.

## 3.12 Requirement of the Project

The successful implementation and operation of the **Ashulia, Savar Yongli Biotechnology Co. Ltd., Industrial Protein Powder from Tannery Waste** project will require the following key resources:

### 3.12.1 Major Building Components and Specifications

## 3.13 Water Requirement Calculation

*(Construction Phase & Operation OPhase)*

### 1. Basis of Water Demand Estimation

Water demand has been estimated based on:

- **Bangladesh National Building Code (BNBC)**
- **WHO norms for Industrial Protein Powder from Tannery Waste projects**
- **DoE EIA Guidelines**
- **Comparable government Yongli Biotechnology Co. Ltd., Industrial Protein Powder from Tannery Waste projects in Bangladesh**

The calculation considers:

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Industrial Protein Powder from Tannery Waste project beds
- Yongli Biotechnology Co. Ltd., and nursing college students
- Academic and administrative staff
- Residential facilities (hostels, dormitories, staff housing)
- Ancillary services (laundry, kitchen, cleaning, landscaping, firefighting reserve)

## 2. Water Requirement During Construction Phase

### 2.1 Sources of Water

- Groundwater (tube wells) / authorized water supply
- Water tankers (if required)

### 2.2 Components of Water Use

- Construction activities (curing, mixing, dust suppression)
- Domestic use by construction workers
- Equipment washing

### 2.3 Construction Workforce

- Average workforce: **300 persons/day**
- Water demand norm: **45 litres/person/day (lpcd)**

### 2.4 Construction Phase Water Demand Calculation

Purpose	Quantity	Rate	Water Demand (m <sup>3</sup> /day)
Construction works (curing, mixing, dust control)	—	Lump sum	30.0
Domestic use (workers)	300 persons	45 lpcd	13.5
Equipment & site cleaning	—	Lump sum	6.5
<b>Total Construction Phase Demand</b>			<b>50.0 m<sup>3</sup>/day</b>

### 3.14 WATER REQUIREMENT CALCULATION (INDUSTRIAL PROTEIN POWDER FROM TANNERY WASTE PROJECT OPERATION PHASE – DETAILED CALCULATION)

This section presents a **revised and optimized calculation of water requirements and wastewater generation**, ensuring that the **150 m<sup>3</sup>/day ETP** is sufficient with **10% freeboard**. Domestic water use (drinking, household, sanitation) is calculated separately and **not connected to the ETP**.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## Basis of Calculation

- **Annual Production Capacity:** 5000 MT
- **Working Days:** 300 days/year
- **Daily Production:**

$$5000/300=16.67\approx 17 \text{ MT/day}$$

- **Design Condition:**
  - **ETP Capacity:** 150 m<sup>3</sup>/day
  - **With 10% Freeboard** → **Effective Design Load:**

$$150 \times 0.90 = 135 \text{ m}^3/\text{day}$$

Therefore, **maximum wastewater generation must be  $\leq 135 \text{ m}^3/\text{day}$**

## Process-wise Water Consumption and Wastewater Generation

To ensure ETP adequacy, **water-efficient operation and reuse** are considered.

Sl. No.	Process Unit	Water Use (m <sup>3</sup> /day)	Wastewater Generation (m <sup>3</sup> /day)	Remarks
1	Washing	45	40	Partial reuse, solid removal loss
2	Hydrolysis	40	35	Part consumed in reaction
3	Filtration & Dechromisation	30	28	Sludge separation loss
4	Utilities (Cooling, Boiler, etc.)	20	15	Evaporation loss considered
5	Floor Washing & Misc.	15	12	Controlled usage
<b>Total (Process)</b>	—	<b>150 m<sup>3</sup>/day</b>	<b>130 m<sup>3</sup>/day</b>	Within the ETP capacity

## Total Industrial Wastewater Load to ETP

- **Total Wastewater from Process:**  $\approx 130 \text{ m}^3/\text{day}$

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- **ETP Effective Capacity (with 10% freeboard): 135 m<sup>3</sup>/day**

The **ETP (150 m<sup>3</sup>/day)** is **sufficient**, as:  $130 < 135 \text{ m}^3/\text{day}$

## Domestic Water Requirement (Not Connected to ETP)

Domestic water use is considered separately and discharged to **septic tank/soak pit system**.

Assuming **50 personnel**:

Purpose	Water Consumption Rate	Total (m <sup>3</sup> /day)
Drinking	5 L/person/day	0.25
Household (washing, canteen)	25 L/person/day	1.25
Sanitation (toilet, bathing)	45 L/person/day	2.25
<b>Total Domestic Water</b>	—	<b>3.75 m<sup>3</sup>/day (~4 m<sup>3</sup>/day)</b>

👉 **Note:** This domestic wastewater **will not enter the ETP** and will be managed through a **septic tank and a soak pit**.

## Overall Water Balance Summary

Component	Quantity (m <sup>3</sup> /day)
Total Industrial Water Input	150
Industrial Wastewater to ETP	130
Loss (Evaporation, Product Moisture)	20
Domestic Water Use	4
<b>Total Water Requirement</b>	<b>154 m<sup>3</sup>/day</b>

## Water Conservation and Control Measures

- Recycling of washing water after primary treatment
- Controlled water dosing in hydrolysis
- Use of a **closed-loop cooling system**
- Minimization of floor wash water
- Regular monitoring to maintain **ETP load within 135 m<sup>3</sup>/day**

The total **industrial wastewater generation is approximately 130 m<sup>3</sup>/day**, which is within the **effective ETP capacity of 135 m<sup>3</sup>/day (considering 10% freeboard)**. Therefore, the **150 m<sup>3</sup>/day ETP is fully sufficient** for the project.

Domestic water demand (~4 m<sup>3</sup>/day) is managed separately and does not impact the ETP performance.

The proposed system ensures **efficient water use, proper wastewater management, and compliance with environmental standards**.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 3.14.1 Wastewater Management Strategy

The proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project** will implement a comprehensive wastewater management strategy to ensure environmentally sound operations, efficient water use, regulatory compliance, and the protection of surrounding water resources.

The wastewater management framework has been developed considering:

- Nature of tannery waste processing operations
- Wastewater characteristics generated from industrial activities
- Existing industrial environment of the project area
- Department of Environment (DoE) compliance requirements
- Zero Liquid Discharge (ZLD)-oriented reuse philosophy

Wastewater generated during operation will primarily originate from:

- Washing section
- Hydrolysis section
- Filtration section
- Dechromisation section
- Floor washing and equipment cleaning
- Utility operations
- Domestic sewage from workers and staff facilities

The project will maintain **segregated treatment systems** for industrial and domestic wastewater streams.

### Wastewater Treatment Strategy

All wastewater generated from the project will be treated through:

#### A. Effluent Treatment Plant (ETP)

(For Industrial Process Wastewater)

Industrial wastewater generated from production activities will be treated through a dedicated:

#### 150 m<sup>3</sup>/day Effluent Treatment Plant (ETP)

The ETP will manage wastewater generated from:

- Washing operations
- Hydrolysis process

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Filtration process
- Dechromisation process
- Process floor washing
- Utility wastewater

## B. Sewage Treatment Plant (STP)

(For Domestic Sewage)

Domestic wastewater generated from:

- Staff toilets
- Wash basins
- Bathrooms
- Kitchen and domestic facilities

will be treated separately through a dedicated **Sewage Treatment Plant (STP)**.

## Environmental Protection Commitment

The proposed wastewater management strategy is based on the following principles:

- No untreated wastewater discharge outside project boundary.
- No direct discharge into nearby **Government Khal** or any surface water body.
- Maximum wastewater recovery and reuse.
- Compliance with applicable **DoE discharge standards**.
- Reduction of freshwater demand through internal recycling.

### 3.14.2 ETP + STP Process Flow Diagram

The following represents the proposed treatment configuration for wastewater generated from the **Industrial Protein Powder from Tannery Waste Project**.

#### Industrial Wastewater Treatment Process (ETP)

Process Wastewater Collection Network

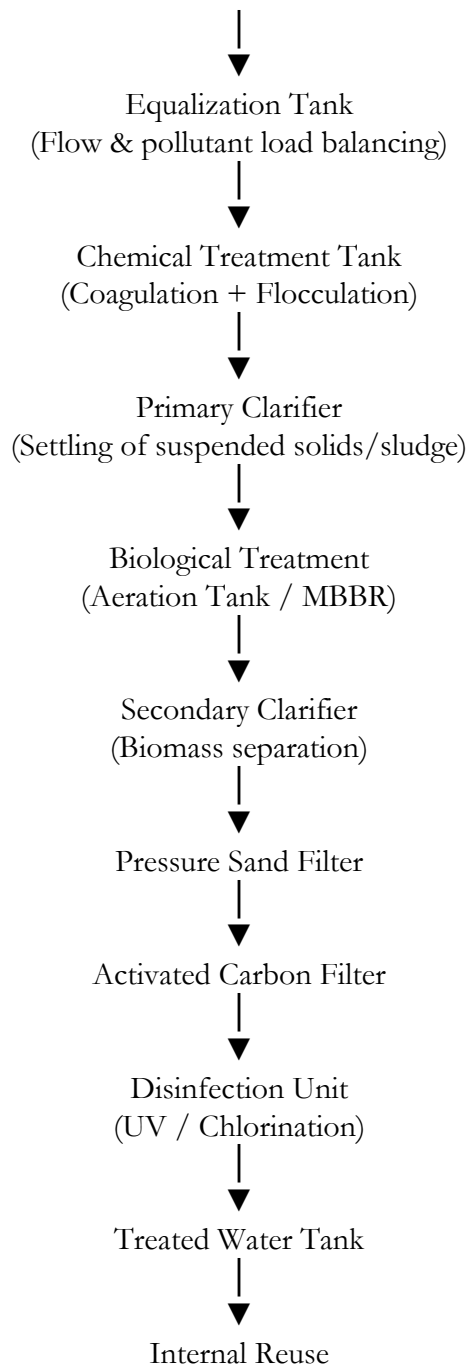
(Washing + Hydrolysis + Filtration + Dechromisation)



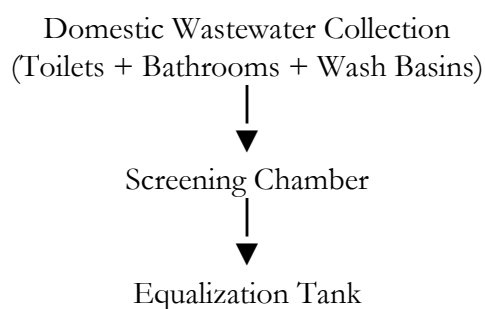
Screening Chamber

(Removal of coarse solids, leather particles, debris)

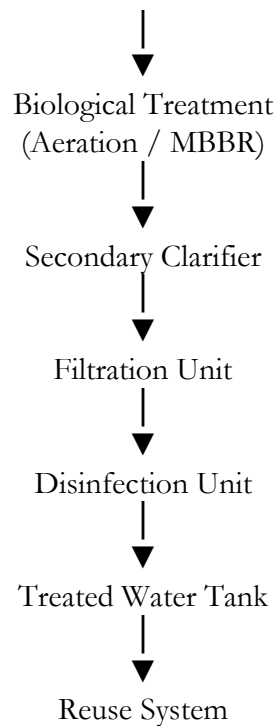
# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)



## Domestic Wastewater Treatment Process (STP)

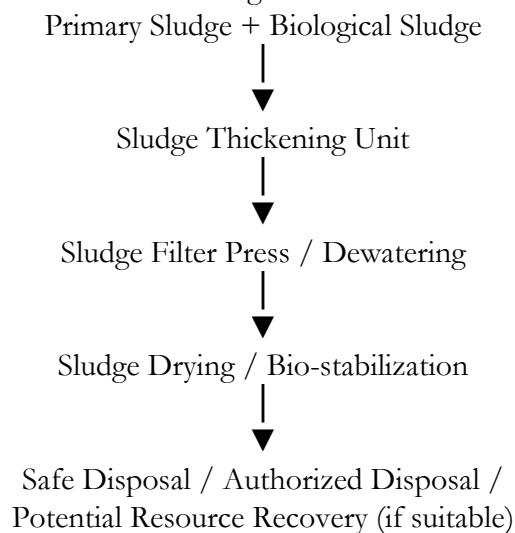


# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)



## Sludge Management Line

Both industrial and domestic treatment systems will generate sludge requiring proper management.

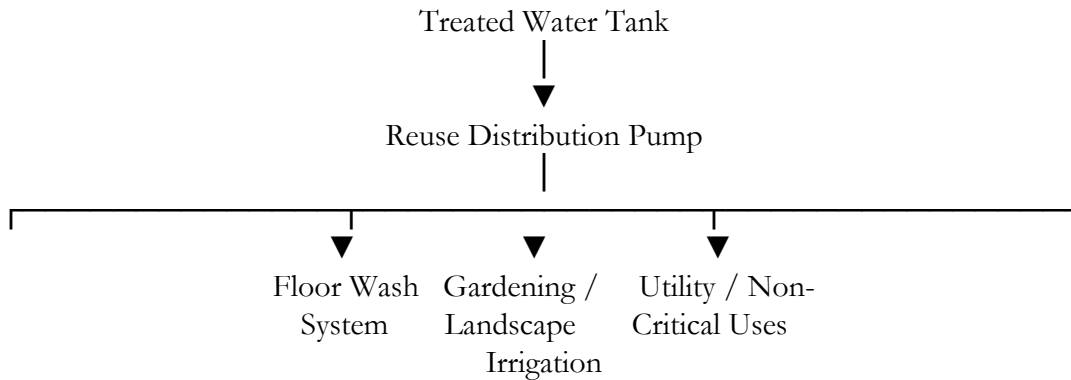


### 3.14.3 Water Reuse Pipeline Layout Concept

To minimize freshwater abstraction and strengthen environmental sustainability, the project will adopt a **water reuse distribution network**.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## Water Reuse System Concept



## Reuse Applications

Recovered treated water may be utilized for:

Reuse Area	Application
Floor Cleaning	Process area cleaning
Greenbelt Development	Irrigation of plantation and landscaping
Road Cleaning	Dust suppression and road wash
Utility Services	Non-critical industrial cleaning operations

## Separate Water Distribution Network

The project will maintain separate pipeline systems to ensure safe water management.

Water Line	Use
Fresh Water Line	Drinking, kitchen, potable use
Grey Water Line	Bathroom and wash basin wastewater
Black Water Line	Toilet sewage
Industrial Effluent Line	Process wastewater from production sections

All wastewater streams will ultimately be directed toward the respective **ETP/STP treatment systems**.

## Integrated Environmental Water Management

Through:

- Dedicated **150 m<sup>3</sup>/day ETP**
- Separate **STP system**

## **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- Water reuse system
- Segregated wastewater collection
- Monitoring and operational control

the project will operate in an environmentally responsible manner without creating adverse impacts on nearby drainage channels or water resources.

### **Environmental Sustainability Outcome**

Under the proposed wastewater management arrangement:

- ✓ No untreated discharge to nearby **Government Khal**
- ✓ No direct release to surface water bodies
- ✓ Reduced freshwater extraction demand
- ✓ Internal water recycling and conservation
- ✓ Compliance with **DoE environmental requirements**
- ✓ Strengthened sustainable industrial operation

Accordingly, with implementation of the proposed **ETP, STP, reuse system, and ZLD-oriented wastewater management approach**, the project is expected to operate within acceptable environmental limits while protecting surrounding water resources.

#### **3.14.4 Pollution Potential of the Project**

The proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project** involves the processing of **tannery leather waste into industrial protein powder** through several operational stages including **shredding, washing, hydrolysis, filtration, dechromisation, concentration, multi-effect evaporation, and spray drying**.

Considering the nature of raw materials, industrial operations, chemical handling, and utility systems, the project possesses potential for generating environmental pollutants affecting **water, air, soil, noise environment, occupational health, and surrounding receptors** if appropriate pollution control systems are not maintained.

However, the project design incorporates modern environmental safeguards including **150 m<sup>3</sup>/day ETP, STP, Zero Liquid Discharge (ZLD)-oriented reuse system, air pollution control measures, chemical management, and waste management practices**.

The pollution potential assessment is presented below.

#### **A. Wastewater Pollution Potential**

Wastewater generation represents one of the major environmental concerns for the proposed project.

Industrial wastewater will mainly originate from:

- Washing process
- Hydrolysis section

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Filtration process
- Dechromisation section
- Floor washing and equipment cleaning
- Utility operations

Domestic wastewater will originate from:

- Staff toilets
- Bathrooms
- Wash basins
- Kitchen facilities

The industrial effluent may contain:

- High **BOD (Biochemical Oxygen Demand)**
- High **COD (Chemical Oxygen Demand)**
- Suspended solids (TSS)
- Proteinaceous organic matter
- Variable pH
- Residual chemicals
- Trace chromium and heavy metals
- Oil and grease

Potential environmental risks include:

- Surface water contamination.
- Groundwater quality deterioration.
- Drainage system pollution.
- Soil contamination through accidental leakage.

The project area contains a nearby **Government Khal**, which represents an environmentally sensitive water receptor.

However, pollution control measures include:

- Dedicated **150 m<sup>3</sup>/day ETP**.
- Separate **STP** for domestic sewage.
- **Zero Liquid Discharge (ZLD)-oriented water reuse system**.
- No untreated wastewater discharge outside the project boundary.
- Regular wastewater quality monitoring.

Accordingly, the pollution potential to surrounding water bodies is expected to remain **low under controlled operational conditions**.

### B. Air Pollution Potential

Air pollution potential may arise from both process operations and utility systems.

Potential emission sources include:

- Spray drying operation.
- Boiler operation.
- Diesel generator.

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- Raw material handling.
- Internal vehicle movement.
- Dry powder handling and packaging.

Expected pollutants may include:

- Particulate matter (PM)
- Protein dust
- Combustion gases (SO<sub>x</sub>, NO<sub>x</sub>, CO)
- Odorous emissions
- Vapors and fine aerosols

Raw tannery waste handling may also create localized odor generation if material storage is not properly controlled.

Potential impacts include:

- Localized deterioration of ambient air quality.
- Worker respiratory exposure.
- Odor nuisance.
- Dust deposition around operational areas.

Pollution control measures proposed include:

- Adequate stack height for combustion units.
- Covered raw material storage.
- Rapid processing of incoming tannery waste.
- Internal housekeeping practices.
- Periodic emission monitoring.

With implementation of these measures, air pollution impacts are expected to remain **manageable and within acceptable environmental standards**.

### C. Solid Waste Pollution Potential

The project may generate several types of solid waste during operation.

Potential solid wastes include:

- Leather residues
- Screening solids
- Filtration residues
- ETP sludge
- Chemical sludge
- Packaging waste
- ZLD residual solids
- Maintenance waste

Improper waste handling could result in:

- Soil contamination.
- Odor generation.
- Secondary pollution.

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Leachate formation.
- Drain blockage.

Special attention is required for sludge and residues potentially containing:

- Chromium traces.
- Chemical contaminants.
- Organic process solids.

Mitigation measures include:

- Waste segregation.
- Designated waste storage zones.
- Sludge dewatering.
- Safe handling procedures.
- Authorized disposal system.
- Recycling of suitable materials.

Consequently, solid waste pollution potential can be significantly minimized through proper waste management.

### D. Soil Pollution Potential

Potential soil pollution may arise from:

- Chemical spills.
- Leakage from wastewater pipelines.
- Sludge handling.
- Improper waste storage.
- Fuel or lubricant leakage.

Potential consequences include:

- Soil quality deterioration.
- Reduced soil permeability.
- Secondary groundwater contamination risk.

Control measures include:

- Impervious flooring.
- Chemical containment systems.
- Leak-proof storage areas.
- Preventive maintenance of pipelines and tanks.
- Spill response protocol.

Therefore, soil contamination risk is considered **moderate but controllable**.

### E. Noise Pollution Potential

Operational activities may generate noise from:

- Shredding equipment.
- Pumps and blowers.

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Hydrolysis unit operation.
- Dryer system.
- Compressors.
- Generator operation.
- Material transport vehicles.

Potential impacts include:

- Worker discomfort.
- Occupational stress.
- Temporary disturbance to nearby operational areas.

The surrounding area is already characterized by an industrial acoustic environment due to existing industries.

Noise mitigation measures include:

- Equipment maintenance.
- Acoustic enclosure.
- Vibration control.
- PPE usage.
- Operational monitoring.

Therefore, operational noise impacts are expected to be **localized and manageable**.

### F. Chemical Pollution Potential

The project will involve handling of chemicals associated with:

- Hydrolysis operation.
- pH adjustment.
- Dechromisation process.
- ETP operation.

Potential pollution concerns include:

- Chemical spill incidents.
- Worker exposure.
- Surface contamination.
- Accidental environmental release.

Risk reduction measures include:

- Controlled chemical dosing.
- Secure chemical storage.
- Secondary containment.
- Safety training.
- Material Safety Data Sheet (MSDS) implementation.
- Emergency spill response preparedness.

### G. Cumulative Pollution Potential

A special consideration for this project is the existence of an **operational DoE-approved gelatin manufacturing facility within the same industrial boundary**, located approximately **200 feet from the proposed project shed**.

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

The existing industry processes **tannery waste into gelatin for pharmaceutical capsule shell production.**

Therefore, cumulative environmental considerations may include:

- Combined wastewater generation.
- Combined air emissions.
- Shared utility demand.
- Transportation movement.
- Industrial noise contribution.

However, the proposed project remains environmentally compatible because:

- Similar feedstock handling already exists.
- Industrial land use compatibility has been established.
- Existing environmental approval history is available.
- Independent treatment and pollution control systems will be maintained.

Accordingly, cumulative pollution potential is considered **moderate but manageable under coordinated environmental management practices.**

Table 3-7 Pollution Potential Assessment Summary Table

Pollution Component	Potential Source	Potential Impact	Mitigation / Control Measure
Wastewater	Washing, Hydrolysis, Dechromisation	Water pollution	150 m <sup>3</sup> /day ETP + STP + ZLD
Air Emission	Spray Dryer, Boiler, Generator	Dust, gases, odor	Bag filter, stack, monitoring
Solid Waste	Sludge, residues, packaging	Soil pollution	Segregation and safe disposal
Soil Contamination	Chemical leakage	Soil quality impact	Impervious flooring and containment
Noise	Machinery and vehicles	Worker disturbance	Maintenance and PPE
Chemical Risk	Chemical handling	Spill and exposure	Secure storage and emergency control
Cumulative Impact	Existing adjacent industry	Combined industrial load	Integrated environmental management

The proposed **Industrial Protein Powder from Tannery Waste Project** possesses identifiable pollution potentials associated with wastewater generation, air emissions, solid waste, chemical handling, and industrial operation. However, the incorporation of:

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- 150 m<sup>3</sup>/day ETP
- Separate STP
- Zero Liquid Discharge (ZLD) reuse system
- Air pollution control devices
- Waste management system
- Chemical handling protocol
- Environmental monitoring framework

ensures that pollution risks remain **technically manageable and environmentally acceptable**.

Considering the existing approved gelatin manufacturing facility within the same industrial boundary, the proposed project represents a **compatible industrial expansion** rather than introduction of a completely new environmental pressure source.

While the project has moderate to high pollution potential, especially from water and air pollutants, **adequate mitigation measures**, including a high-capacity ETP+STP, cleaner fuel use, emission control systems, and waste management protocols, have been incorporated to minimize environmental impact and ensure compliance with regulatory standards.

## 3.15 Roads

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Roads should be designed to accommodate all vehicles likely to be used during construction and throughout the project's life. Roads and pavements must comply with the National Building Code of Practice or an equivalent.

## 3.16 Generator building

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The dimensions of all buildings must be such that they provide a generous space for the safe installation, proper operation, and maintenance of the project. In particular, a generous space must be provided immediately in front, behind, and next to all the floor elements. The design of all cottages must guarantee that the noise, vibration, and temperature levels are within the allowed limits.

## 3.17 Operation Phase

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### 3.17.1.1 Traffic

The entrance to the project has been designed to facilitate easy exit from the Ashulia, Savar Sadar and Ashulia, Savar-Dhaka highways and to prevent traffic congestion at the entrance.

### 3.17.1.2 Water demand

The total estimated water demand by the project during operation will be approximately 100 m<sup>3</sup>/hr. This will be sourced from their own Deep Tube Well and will reuse the treated wastewater.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 3.17.2 WATER POLLUTION POTENTIAL AND MITIGATION MEASURES

### (With Implementation of Zero Liquid Discharge – ZLD Program)

The operation of the proposed **industrial protein powder manufacturing plant from tannery waste** involves multiple wet processing stages, which have the potential to generate wastewater containing **organic load, suspended solids, and trace heavy metals**. This section evaluates the **water pollution potential** and presents a comprehensive **mitigation strategy incorporating a Zero Liquid Discharge (ZLD) approach** to ensure complete environmental protection.

#### Water Pollution Potential

##### a) Sources of Wastewater Generation

Wastewater is primarily generated from the following process units:

- **Washing:** Removal of dirt, blood, and impurities from leather waste
- **Hydrolysis:** Breakdown of collagen/protein using water and chemicals
- **Filtration:** Separation of solids from the liquid phase
- **Dechromisation:** Removal of chromium and trace heavy metals
- **Utilities and Floor Washing:** Equipment cleaning and general maintenance

##### b) Characteristics of Wastewater

The generated wastewater is expected to have the following characteristics:

- **High BOD and COD:** Due to dissolved organic matter (protein, collagen residues)
- **Total Suspended Solids (TSS):** From fine particles and undissolved solids
- **Chromium and Heavy Metals:** From tannery-origin raw materials
- **Variable pH:** Depending on hydrolysis and chemical treatment stages
- **Odor Potential:** Due to the decomposition of organic substances

If discharged without treatment, this wastewater may cause:

- **Surface water pollution** (oxygen depletion, aquatic toxicity)
- **Groundwater contamination**
- **Soil degradation**
- **Public health risks**

#### Mitigation Measures with ZLD Implementation

To eliminate water pollution risks, the project will implement a **Zero Liquid Discharge (ZLD) system**, ensuring that **no untreated or treated wastewater is discharged outside the facility**.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## a) Effluent Treatment Plant (ETP) – Primary Treatment Stage

A **150 m<sup>3</sup>/day capacity ETP** will be installed to treat all industrial wastewater. The treatment process will include:

1. **Equalization Tank:** Flow and load balancing
2. **Coagulation & Flocculation:** Removal of suspended solids and colloidal particles
3. **Primary Clarifier:** Settling of flocs
4. **Biological Treatment (Aeration Tank):** Reduction of BOD and COD
5. **Secondary Clarifier:** Biomass separation
6. **Tertiary Treatment:** Sand filter and activated carbon filter for polishing

👉 This stage ensures that wastewater meets **pre-ZLD quality standards**.

## b) Advanced Treatment and Water Recovery (ZLD Core System)

After ETP treatment, water will be further processed through:

- **Ultrafiltration (UF):** Removal of fine suspended solids and microorganisms
- **Reverse Osmosis (RO):** Separation of dissolved salts and impurities

### Outcome:

- **RO Permeate (70–80%)** → Reused in process (washing, utilities)
- **RO Reject (20–30%)** → Sent to evaporation system

## c) Multi-Effect Evaporation (MEE)

- Concentrates the RO reject stream
- Recovers additional water for reuse
- Reduces liquid volume significantly

## d) Agitated Thin Film Dryer (ATFD) / Salt Recovery

- Final drying of concentrated residue
- Converts remaining liquid into **solid salts/sludge**
- Ensures **complete elimination of liquid discharge**

## Water Reuse Strategy

Recovered water will be reused in:

- Raw material washing

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Cooling and utility systems
- Floor cleaning and miscellaneous uses

This reduces **freshwater demand** and enhances **resource efficiency**.

## Sludge and Residual Management

- **ETP Sludge:** Dewatered using sludge drying beds or filter press
- **ZLD Residue (Salts):** Collected and disposed of in an **approved hazardous waste landfill**
- Regular testing for **heavy metals (e.g., chromium)** before disposal

## Monitoring and Control Measures

- Regular monitoring of **pH, BOD, COD, TSS, and heavy metals**
- Installation of **flow meters and online monitoring systems**
- Periodic inspection and maintenance of ETP and ZLD units
- Record keeping and reporting as per **Department of Environment (DoE)** requirements

## Environmental Benefits of ZLD Implementation

- **Zero discharge** of wastewater to the external environment
- Elimination of **surface and groundwater pollution risks**
- Significant reduction in **freshwater consumption**
- Compliance with **national environmental regulations** and international best practices
- Promotion of **circular water economy** within the industry

The proposed implementation of a **Zero Liquid Discharge (ZLD) system**, integrated with a **150 m<sup>3</sup>/day ETP**, ensures that all wastewater generated from the industrial protein powder production process is **effectively treated, recovered, and reused** within the facility.

This approach completely eliminates the risk of **water pollution**, making the project environmentally sustainable and compliant with regulatory standards. The adoption of ZLD demonstrates a strong commitment to **advanced environmental management and responsible industrial operation**.

With the implementation of a **comprehensive Zero Liquid Discharge (ZLD) Program**, the proposed Industrial Protein Powder from Tannery Waste project will **not cause any significant water pollution**. All wastewater will be **treated, reused, and managed within the project**

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

**boundary, ensuring full compliance with DoE regulations and protection of the water body and the surrounding water environment**

### **3.17.3 Noise**

As vessels are constructed on many levels, falling objects are a hazard. In addition, personnel can be struck by falling or moving objects during fabrication, resulting in failures of fixtures and conveyance gantries.

#### **Confined spaces**

Many areas on a vessel are designated as confined spaces, which can lead to vapor buildup.

Poor management of materials, waste, and production discharges poses a potential risk of soil contamination. Accidental discharges from ETP may also contaminate groundwater in areas where soils beneath the site are permeable.

Contamination could arise from deteriorating drainage networks.

Other Potential Environmental, Health, and Safety Risks/Liability Issues

#### **Machinery**

All equipment should have safety guarding, and workers should be issued with appropriate personal protective equipment to protect against unavoidable sharp items and edges. Particular attention should be paid to metal-cutting equipment.

#### **Occupational Dermatitis**

This can occur due to contact with antioxidants, chromates, and solvents.

To protect workers and surroundings from noise pollution, the authority changes in the workplace that reduce or eliminate worker exposure to noise hazards, such as:

- Operate noisy machines during shifts when fewer people are exposed;
- By applying the job rotation policy;
- Limit the amount of time a person spends near a noise hazard;
- Provide quiet areas where workers can gain relief from noise hazards;
- Restrict how close a worker can get to a noise hazard. Therefore, controlling noise hazard exposure by maintaining a distance from the noise hazard is often an effective, simple, and inexpensive administrative control
- Provide workers with PPE

### **3.18 Protection Across the Water body (Water body Protection Measures)**

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The proposed Yongli Biotechnology Co. Ltd. Industrial Protein Powder from Tannery Waste project is located near a natural water body. Considering the ecological, hydrological, and socio-environmental importance of the water body, comprehensive protection measures have been incorporated into the project planning, design, construction, and operation phases to ensure that no adverse impacts occur on **water quality, aquatic ecology, or the surrounding environment.**

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 1. Protection Measures During Construction Phase

1. **No Direct Discharge Policy**
  - No untreated wastewater, construction runoff, or liquid waste shall be discharged into the water body under any circumstances.
  - Temporary drainage channels will be constructed to divert stormwater away from the water body.
2. **Sediment and Erosion Control**
  - Silt traps, sedimentation pits, and temporary retention ponds will be installed to prevent soil erosion and sediment-laden runoff from entering the water body.
  - Excavated soil will be stockpiled away from the water body edge and covered during the rainy season.
3. **Buffer Zone Maintenance**
  - A green buffer zone will be maintained between the construction area and the water body boundary.
  - No construction activity, material storage, or vehicle parking will be allowed within the buffer zone.
4. **Fuel and Chemical Management**
  - Fuel, lubricants, paints, and chemicals will be stored in secured, impermeable areas with secondary containment.
  - Refueling and maintenance of machinery will be strictly prohibited near the water body.
5. **Waste Management**
  - Construction waste will be collected, segregated, and disposed of at approved disposal sites.
  - No solid waste dumping will be permitted near or into the water body.
6. **Noise and Vibration Control**
  - Construction activities will be restricted to daytime hours to minimize disturbance to aquatic fauna and nearby communities.

## 2. Protection Measures During the Operation Phase

1. **Installation of ETP and STP**
  - An **Effluent Treatment Plant (ETP) and Sewage Treatment Plant (STP)** will be installed to treat all project wastewater and domestic sewage.
  - **Zero direct discharge to the water body** will be ensured.
2. **Treated Water Reuse**
  - Treated effluent from the STP/ETP will be reused for:
    - Toilet flushing
    - Gardening and landscaping
    - Road and pavement washing
  - This will significantly reduce wastewater discharge and freshwater extraction.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 3. Stormwater Drainage System

- A separate stormwater drainage system will be developed to prevent contaminated runoff from reaching the water body.
- Drainage outfalls will include oil traps and silt chambers.

## 4. Green Belt and Water Body Buffer Zone

- Native tree species and vegetation will be planted along the water body-facing boundary.
- The green belt will act as a physical and ecological barrier against pollution.

## 5. Emergency Spill Response

- An emergency response plan will be implemented for accidental spills of chemicals, fuel, or medical waste.
- Spill kits will be maintained on-site at critical locations.

## 3. Monitoring and Compliance

### 1. Water Quality Monitoring

- Regular monitoring of the water quality upstream and downstream of the project area will be conducted.
- Parameters will include pH, DO, BOD, COD, TSS, nutrients, and microbiological indicators.

### 2. Regulatory Compliance

- All activities will comply with:
  - Environmental Conservation Act, 1995
  - Environmental Conservation Rules, 2023
  - Air Pollution Control Rules, 2022
  - Sound Pollution Control Rules, 2025
  - DOE clearance conditions

### 3. Reporting

- Environmental monitoring results will be documented and submitted to the Department of Environment as required.

## 4. Overall Environmental Safeguard Statement

With the implementation of the above water body protection measures, the project will **not degrade water body water quality, aquatic habitats, or the ecological balance**. The proposed mitigation and management measures ensure long-term environmental sustainability while supporting essential healthcare and educational services.

### 3.19 Alternative Analysis

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# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

There is no scope for considering alternatives.

## 3.20 SWOT Analysis

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### Strengths

- Support and social acceptance from local residents and stakeholders
- Land acquisition completed and handed over to the Project Director
- No displacement of people required
- No risk of waterlogging due to proximity to a water body
- Good road connectivity with Ashulia, Savar town, and the surrounding upazilas
- Project site located adjacent to Ashulia, Savar town, and District Industrial Protein Powder from Tannery Waste project (approximately 0.25 km)
- Ongoing academic activities
- Proximity to police and military establishments

## 3.21 Technical, Technological, and Engineering Analysis

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The proposed site for the **Ashulia, Savar leather industry by-products in an efficient manner** is located in **Mouza No. 102, Rangapani**, under **Ashulia, Savar Sadar Upazila**. The site is situated approximately **2.6 km southwest of Ashulia, Savar town**. Once the bridge under construction over **the Water body is completed, the distance to the District Industrial Protein Powder from the Tannery Waste project** will be only 0.25 km, improving road connectivity with Ashulia, Savar town, other upazilas, and neighboring districts. This will enable the local population to access healthcare services easily.

The population of this area is **rapidly increasing**, and the **agriculture and tourism sectors** are growing in economic and geographic significance. In this context, access to healthcare services becomes a priority. There is currently **no private Yongli Biotechnology Co., Ltd., or tertiary Industrial Protein Powder from Tannery Waste project** in this hilly region. The establishment of the Ashulia, Savar leather industry by-products in an efficient manner, along with the Nursing College, will help **reduce pressure on the healthcare system** in Dhaka, while producing doctors, nurses, and other health professionals. This will also create **employment opportunities** for the local population.

## 3.22 Environmental Sustainability, Climate Resilience, and Disaster Risk Analysis

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### 3.22.1 Environmental and Climate Risk Analysis

#### (a) Environmental Hazards and Climate Change Risks

1. **Landslide Risk:** High due to rainfall of **3,031 mm**, exceeding the national annual average of **2,200 mm**.
2. **Potential Impact on Environmental Balance:** Construction may affect local ecology and biodiversity.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

3. **Seismic Zone:** Medium-risk earthquake-prone area.
4. **Impact on Aquatic Habitats:** Rivers, canals, wetlands, and floodplains host diverse aquatic flora and fauna, supporting livelihoods, food, and economic benefits for local communities. Key species include: **Catla, Bacha, Puntius, Punti, Bais, Mola, Chela, Tengra, Magur, Air, Batas, and Kajri.** Water pollution is a potential environmental concern.

## (b) Risk Mitigation Measures

1. **Landslide Risk:** Construct retaining walls along pond and water body edges; plant trees and grass; implement emergency preparedness and relocation plans.
2. **Environmental Balance:** Reduce impact by preserving trees and water bodies; conduct afforestation.
3. **Seismic Area:** Use **earthquake-resistant construction techniques.**
4. **Aquatic Habitat Protection:** Preserve water bodies during construction; avoid encroachment.

## (c) Environmental Impact Assessment (EIA)

The EIA analysis indicates that the proposed project is **environmentally friendly**. If proper management is followed, it **will not cause long-term damage to the surrounding environment**.

### Environmental Management Measures Include:

- Proper operation and maintenance
- Environmental Management System (EMS)
- Staffing for the environmental management and monitoring cell
- Regular environmental monitoring and reporting

## (d) Compensation, Rehabilitation, and Resettlement

- No **households** exist on the proposed site. Local authorities confirmed that the land is fallow mainly, so no **resettlement is needed**.

### 3.22.2 Disaster Resilience Assessment

- **Construction Phase Impacts:**
  - Excavation may trigger **landslides** and generate dust.
  - Nearby vegetation and the Water body may be affected.
  - Temporary reduction in water quality may occur due to excavation and the use of fuel and lubricants.
- **Mitigation:**
  - Impacts are **temporary and site-specific**.
  - Can be controlled with **proper mitigation measures and monitoring systems**

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## CHAPTER 4 BASELINE ENVIRONMENT

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### 4.1 General Consideration

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The baseline condition of the environment states the present status of different components of the environment. The main objective of examining the present environment is to provide an environmental baseline against which potential impacts from the construction and operational phases of any project can be compared. A second important function of establishing a baseline for parameters such as air and water quality is to ensure that any problems arising from existing sources are not erroneously attributed to the project under study. The different environmental parameters that are included in this baseline study are land, water quality, air quality, climate, and noise.

### 4.2 Study Area

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Savar is the second-largest (total area 280 km<sup>2</sup>) Upazila in the Dhaka district and is rapidly growing in the context of urbanization and industrialization. Geographically, it is situated at the northern edge of Dhaka, between 23°44' N and 24°12' N latitude and between 90°11' E and 90°22' E longitude. Savar Upazila is divided into twelve unions (the lowest administrative division), among which the Shimulia Union encompasses the largest area and Savar Pourashava (a town) the smallest. Savar is one of the most densely populated upazilas in Bangladesh, with a total population of 1,387,426. The population density of the region is 4,951 persons per km<sup>2</sup>, whereas the national population density is 1,015 persons per km<sup>2</sup> (BBS, 2011).

**Youngli Biotechnology Co. Ltd.** and surroundings showing the vicinity including major land use, roads, mosque, other big and small-scale infrastructures and features present in the area and are considered to be possibly minor affected by the construction and commissioning of the project. This is considered the environmental study area for the proposed project.

### 4.3 Land Use in the Project Area

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The project is located in the Savar sub-district of Dhaka. In the environmental assessment study for the construction and operation of the project, the surrounding environment is required to be considered. The brief of the ongoing environmental condition of the district is given in the next sections. Dhaka is a district in central Bangladesh and is the densest district in the nation. It is a part of the Dhaka Division. Dhaka, the capital of Bangladesh, rests on the eastern banks of the Buriganga River, which flows from the Turag to the south of the district. Dhaka district consists of Dhaka city, Keraniganj, Nababganj, Dohar, Savar, and Dhamrai upazilas. The map of Savar Upazila is given in the following Figure.

The description of the existing environment is limited to the study area or the Project Impact Area (PIA) of the Basic Option. However, where necessary, the area has been expanded beyond the PIA. The baseline study records are required for environmental settings against which potential impacts from the construction and operational phase of the project can be compared. In the present study, the different environmental components are examined for setting a baseline. The selection of the PIA is based on the following factors.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Project Sites Areas directly affected by the project itself and areas indirectly affected (maintenance area etc.)
- Locations affected by construction activities (quarries, refuse disposal areas, tunnel muck disposal areas, traffic diversions, work camps, temporary access roads etc.)
- Fauna and flora in the inundation area: - Fauna and flora in the area up to the high flood level - Fauna and flora in the 60 meters reservation area from high flood level
- Fauna and flora along the river reservation: Fauna and flora at a distance of 60 meters from the bank along transects at reasonable intervals. Location of line transect were determined according to habitat variation and 100-meter gradient contours.



Figure 4:1 Map of Savar Upazila

## 4.4 Historical Background

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

The origin of the name Savar is thought to be an evolved version of the ancient 7th-8th century township of *Shôrbeshshôr* ("Lord of everything") or *Shômbhar*, situated on the banks of the river known today as the Bangshi. Shôrbeshshôr, in turn, is said to have been established on the site of the ancient Sambagh Kingdom. Local legends as well as archeological finds indicate a king by the name of Harishchandra, said to be of the Pala dynasty, ruled over *Shôrbeshshôr* - purportedly from the first half of the 7th century, having arrived from the Rarh region (Source: Wikipedia).

During the 1971 war, Savar Cantonment (then Ansar Camp) and the then newly founded Jahangirnagar University were some of the first targets of military swoop outside the capital following Operation Searchlight of 25 March. In December of that year, Savar was the last obstacle before the freedom fighters (led by Kader Siddiqui and others) entered the capital and the Pakistan army conceded defeat. Days before the end of the war, teenager Golam Dastagirr Titu was killed in a direct encounter between the Pakistani army and the freedom fighters. The compatriots buried him near the main gate of the Central Cattle Breeding & Dairy Farm, Savar. The Bangladeshi army constructed a memorial monument in his honor (Source: Wikipedia).

## 4.5 Geography

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Savar is located at 23.8583° N & 90.2667° E. It has 66,956 households and a total area of 280.12 square kilometers (108.16 sq mi). Savar Upazila was established in 1981. It is bounded by Kaliakair and Gazipur Sadar upazilas on the north, Keraniganj and Nawabganj upazila on the south, Mirpur, Mohammadpur, Pallabi and Uttara thanas of Dhaka City on the east, and Dhamrai and Singair upazilas on the west. The land of the upazila is composed of alluvium soil of the Pleistocene period. The height of the land gradually increases from the east to the west. The southern part of the upazila is composed of the alluvium soil of the Bangshi and Dhalashwari rivers. The main rivers are Bangshi, Turag, Buriganga, and Karnatali. The Bangshi River has become polluted due to industrial. The total cultivable land measures 17,820 hectares (44034.18 acres), in addition to net crop land of 17580 hectares (43441.13 acres) and uncultivated land of 240 hectares (593.1 acres) (Source: Banglapedia).

## 4.6 Demographics

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As of the 2011 Bangladesh census, Savar Upazila had a population of 1,442,885 and 4948 people live in per square kilometers. Males constituted 54.20% (769117) of the population, and females 45.80% (673768) and ratio between female and male is 100:118. This Upazila's eighteen-up population was 207,401. The religious breakdown was Muslim 91.38%, Hindu 7.74%, Christian 0.93%, Buddhist 0.03% and ethnic minority group nationals numbered 319 including Buno, Garo, Chakma (Sangma), and Burman. The main occupations are Agriculture 24.34%, agricultural laborer 12.84%, wage laborer 4.44%, cattle breeding, forestry and fishing 1.90%, industry 1.37%, commerce 17.35%, service 20.68%, construction 1.66%, transport 3.96% and others 11.46% (Source: Wikipedia).

## 4.7 Education

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Savar upazila had an average literacy rate of 68.0% (7+ years), and the national average of 59.4% literate. Male literacy was 69% and female was 58%.

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Total number of educational institutions in Savar upazila is 365. There are 4 universities, 10 colleges, 8 school and colleges, 46 high schools, 7 higher secondary schools, 6 junior high schools, 16 madrasas (5 Dakhil madrasa, 4 Alim madrasa, 2 fajil madrasa, 12 Ebtedayi madrasa, 2 Government approved Ebtedayi madrasa), 88 government primary schools, 13 non-government or registered primary schools, 14 community schools, 8 satellite schools, and 1 sports institution (Source: Savar upazila website).

Some of the noteworthy institutions of Savar upazila are given in the following:

- Jahangirnagar University, a Public University, along with its School and College
- National Institute of Textile Engineering and Research - NITER, a Public private partnership Institute, Affiliated Institute University of Dhaka.
- Army Institute of Business Administration (AIBA), an Army Run Educational Institute under Bangladesh University of Professionals (BUP)
- Daffodil International University, a Private University (Permanent Campus))
- Gono Biswabidyalay, a Private University
- Asian University of Bangladesh, a Private University
- Abdul Mannan Degree College Affiliated the National University of Bangladesh (NU)
- Savar University College Affiliated the National University of Bangladesh (NU)
- Zirabo Cantonment Public School & College
- Savar Cantonment Public School and College
- Savar Adhar Chandra High School, A secondary Higher School.
- B.P.A.T.C School and College (Bangladesh Public Administration Training Centre)
- Enam Medical College and Hospital (founded by MP Enam).
- Radio Colony Model School, Bangladesh Betar
- Shimulia S.P High School, Savar, Dhaka
- Siraz memorial school & college.
- Alhaz Tayab Ali Model School
- Zirabo Dewan Idris College.
- Ashulia College.
- City University.
- Chakulia High School Chakulia, Savar, Dhaka
- Konda High School and College, Nagar Konda, Savar, Dhaka
- Happy Isle International School, Savar, Dhaka
- Savar Darul Ulum Madrasa, Savar, Dhaka
- Jabal- E-Noor Dakhil Madrasah, Savar, Dhaka
- Bhakurta Union High School and College, Bhakurta, Savar, Dhaka

## **4.8 Economy**

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Agriculture and manufacturing are the two major economic sectors in Savar. Main source of income: Agriculture 20.46%, non-agricultural laborer 3.09%, industry 2.82%, commerce 20.55%,

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

transport and communication 5.75%, service 28.74%, construction 2.84%, religious service 0.18%, rent and remittance 2.67% and others 12.90%. The main crops grown here are Paddy, Jute, peanut, onion, garlic, chili and other vegetables. The extinct or nearly extinct crops in the region are Aus paddy, Asha Kumari paddy, sesame, linseed, kali mator, randhuni saj, mitha saj, kaun and mas kalai. The main fruits cultivated here are Jackfruit, mango, olive, papaya, guava, kamranga, berry and banana. There are 181 combined fisheries, dairies and poultries Dairy, 5 hatcheries, 209 poultries, and 1319 fisheries (Source: Wikipedia).

Manufacturing facilities include Ceramic industry, beverage industry, press and publication, garments industry, foot ware, jute mills, textile mills, printing and dyeing factory, transformer industry, automobile industry, biscuit and bread factory, pharmaceutical industry, soap factory, brick field, cold storage, welding, plant nursery, etc. The Cottage industry includes 8 Weaving, 100 goldsmith and 29 others workshops. The main exports are Jackfruit, papaya, flower, sapling, dairy products, meat, transformer, fabrics, dye, medicine, readymade garments, electronics and electric goods, shoe, brick, sweetmeat etc. (Source: Wikipedia).

There are 62 km of pucca (first-class), 52 km of semi pucca, 668 km of mud road; and 50 km of highway, 44 waterway and 92 culverts. Transports used here include the traditional (and extinct or nearly extinct) Palanquin, bullock cart and horse carriage as well as modern day vehicles. The minimum wage is approximately \$9.50 per week, or \$38 per month (Hossain et al., 2013)

Besides, Savar has DEPZ, the 2<sup>nd</sup> largest industrial area in Dhaka. Dhaka Export Processing Zone is a special economic zone of Bangladesh. It is also known as Dhaka EPZ, DEPZ or Savar EPZ for short. It is located in Ashulia Police Station, Savar. This Export Processing Zone was established in 1993 and in 1997 another expanded zone was added to it. Established on an area of 356.22 acres, this EPZ is the second largest export processing area in Bangladesh. The estimated total number of industrial factories in DEPZ is 451. The products produced here include readymade garments, toys, sweaters, blanket head caps, jerseys etc. Exports from Dhaka EPZ amounted to US \$ 1,780.72 million. In the last 8 years, BEPZA has achieved 129.55% growth in investment, 155.95% in exports and 112.30% in employment (Source: Savar upazila website).

## **4.9 Hydrology**

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### **4.9.1 Surface Water Quality**

As the factory is situated in the Dhaka City, therefore the water quality of the baseline environment is considered for the city water quality. The water quality of the Dhaka city is discussed in this section as surface water quality and ground water quality. The quality of water, from both surface and groundwater sources, has recently being endangered by many factors, natural and man-made, which have caused a deterioration. The quality of the water sources used in Bangladesh is at high risk, especially in the capital city of Dhaka, due to increased pollution resulting from unlimited migration of rural people. Consequently, the existing groundwater-based water supply system is not adequate to fulfill the water demand of the mega-city Dhaka. To alleviate the city's present severe water crisis, the question has been asked as to why the Dhaka Water Supply and Sewerage Authority (DWASA) is not using the rivers around Dhaka as a source of water. In this context, DWASA is seriously considering two options: (i) introduction of a separate water supply system for domestic purposes other than drinking water by pumping available river water around the city; and (ii) installation of a small-scale treatment plant for water supply using river water around the

## **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

city as a source of raw water. Implementation of either of these options will require a study on the quality of the water sources, and development of appropriate cost-effective treatment methods. A study has been conducted at the Bangladesh University of Engineering and Technology (BUET) to evaluate the important physical, chemical, and biological water quality parameters of the five rivers around Dhaka City. Test results indicate that the water of all rivers around Dhaka City is highly polluted during the dry season, except for water of the River Sitalakhya. The important water quality parameters in the dry and wet seasons, when compared with earlier values, indicate that the degree of pollution of these rivers is gradually increasing with time. This paper focuses on the study and analysis of important water quality parameters of river waters around Dhaka City (Sohel et al., 2003).

Five rivers, namely: Buriganga, Sitalakhya, Balu, Turag and Tongi are located inside and around Dhaka city. Turag is the nearest river to the project area. Department of Environment (DoE), Bangladesh has published a report on water quality of Bangladesh in 2016. According to the report a graphical presentation of the water quality of Turag River is given in the following figure.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

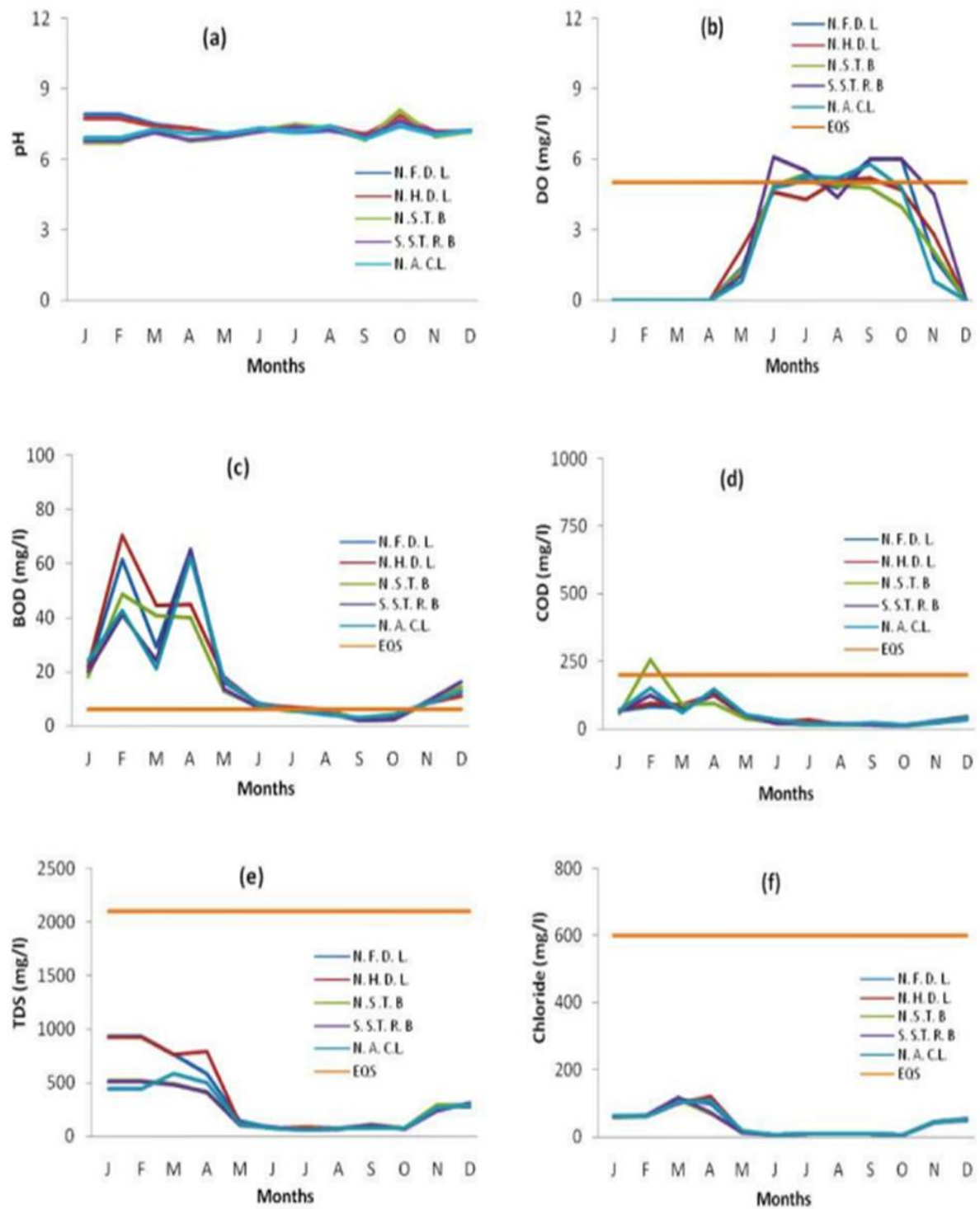


Figure 4:2 Graphical presentation of pH, DO, BOD, COD, TDS, Chloride, and Turbidity of Turag River

Water quality of Dhaka city is regularly monitored by DoE as a routine monitoring program. Water quality of the project area of 2021 is given in the following table.

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Table 4-1 Water parameters of Turag River in 2021 (Source: DoE)

Location	Temp (°C)	pH	EC	Alkalinity (mg/L CaCO <sub>3</sub> )	TSS (mg/L)	TDS (mg/L)	DO (mg/L)	BOD (mg/L)	COD (mg/L)
Ashulia	22.6	7.58	189	96	138	96	3.1	21	44
Turag	22.1	7.58	196	101	123	100	3.4	10	40

There is main four rivers across the Savar. The Bangshi, the Turag, the Buriganga and the Karnatali are these four main rivers. The surface water quality is very poor due to the industrial development nearby these rivers. The river water quality according to the DoE research and other source is given in the following Table.

Table 4-2 The River Water Quality of Savar

Parameters	Buriganga	Bangshi	Turag	EQS for wastewater after treatment from industrial units	Unit	Remarks
pH	6.58 - 7.98	7.32	6.14-8.79	6.5 - 8.5	-	Some data have been taken from the table of the report. Some has been derived by an average calculation from the table of the report.
DO	0.0 - 5.48	4.2	0.0 - 5.9	> 5	mg/l	
BOD	0.6 - 35	5.25	2.0 - 154	< 6 (for Fisheries)	mg/l	
COD	4.83 - 124.3		17-233	200	mg/l	
TDS	60.9 - 639		52.4 - 806	2100	mg/l	
Total Alkalinity	127.27		42 - 280	150	mg/l	
EC	504.19		100 -1682	1200	µmhos/cm	
SS	40.27			150	mg/l	
Chloride		20	786 -129.7	600		

*Source: River Water Quality 2015, Mukti, UITS*

On the other hand, pond, lake, and/or khal are the other sources of surface water. The road side surface water quality of Savar has been found good. One study on the road side water quality has been analyzed by Ahmed (2017).

## **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

According to this study TSS  $25.154 \pm 8.674$  mg/l, TDS  $840.400 \pm 311.081$  mg/l, pH  $7.574 \pm 0.256$  pH unit, DO  $4.544 \pm 0.933$  mg/l, BOD  $0.758 \pm 0.179$  mg/l,  $\text{Cl}^-$   $51.494 \pm 28.095$  mg/l,  $\text{F}^-$   $0.771 \pm 0.153$  mg/l,  $\text{NO}_3^{2-}$   $2.211 \pm 0.878$  mg/l,  $\text{NO}_2^-$   $4.692 \pm 5.971$  mg/l,  $\text{SO}_4^{2-}$   $69.545 \pm 53.873$  mg/l, Ca  $48.458 \pm 22.690$  mg/l, Mg  $19.676 \pm 7.361$  mg/l, K  $12.874 \pm 11.382$  mg/l, Zn  $0.027 \pm 0.029$  mg/l, Pb  $0.096 \pm 0.154$  mg/l.

### **4.9.2 Surface Water Quality of Nearby Waterbody**

#### 4.9.2.1 Sample Collection:

The water samples were collected from 8 different points along the nearest khal of the project at a regular interval of 100 m between each sampling point. The GPS positions were taken from each point and it was shown in the GIS map in Figure 6.3. The samples were taken in plastic containers of 1000 ml capacity and prior sampling the bottles were washed with 20% (V/V)  $\text{HNO}_3$  solution and then rinsed thoroughly with de-ionized water. The containers were completely filled with sample water to the brim. Later the containers were labeled and sealed carefully. The sampling points and coding numbers were marked on the containers by a permanent marker pen. The sampling was started from the upstream of the river near the Dhalai beel down to the downstream upto the Karapara canal.

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# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 4.9.2.2 Methods of the Study

Before attempting detail field survey a reconnaissance survey over the study area has been conducted. It revealed that the general status of the physical environment. Sampling location has been selected from this initial survey with the help of GPS (Table 2). The depth of the sampling was fixed at 2.5 ft for avoiding the surface interference. Detailed field study includes samples collection from appropriate locations, field measurements (pH, DO, Temperature, etc.). Photographs were taken to document the status of the study area and sampling locations. In this study there were a number of physical and chemical parameters studied through different standard methods. The EC, TDS, Salinity, DO, BOD, COD were studied by EC meter of model Hanna, EC 241 conductivity; Hanna HI 8734 TDS meter, C-114; Hanna instrument for Salinity meter; HI 9141, microprocessor auto cal DO meter; 5-day BOD by Winkler method and Closed refluxed titrimetric method for COD, respectively. Heavy metals were studied by Atomic Absorption Spectrometry (AAS)- Model: AA-7000 instrument of SHIMADZU corporation.

Table 4-3 GPS location of the sampling points

Sampling points	Latitude	Longitude
1	219016.23 m E	2647200.58 m N
2	219099.21 m E	2647275.86 m N
3	219164.04 m E	2647217.94 m N
4	219206.66 m E	2647296.06 m N
5	219295.30 m E	2647341.96 m N
6	219339.39 m E	2647385.63 m N
7	219344.58 m E	2647280.04 m N
8	219570.27 m E	2647349.51 m N

Table 4-4 Physico-chemical parameters of the project surrounding

Location	Depth (ft)	Temp. °C	pH	DO (ppm)	TDS g/l	Salinity g/L	EC dS/m	Turbidity FTU	BOD <sub>5</sub> (ppm)	COD (ppm)
L-1	2.5	28	9.90	1.00	1.09	1.30	2.58	22.11	190	182
L-2	2.5	31	9.97	1.40	1.16	1.25	2.71	10.43	148	172
L-3	2.5	27	10.25	3.14	0.85	1.06	2.86	7.66	83	148
L-4	2.5	26	10.31	2.04	1.07	1.25	2.49	26.19	78	122
L-5	2.5	26	10.05	2.36	0.92	1.02	2.08	7.98	79	122
L-6	2.5	27	9.74	2.32	0.79	0.82	1.64	5.74	76	122
L-7	2.5	27	9.55	2.32	0.71	0.76	1.52	16.45	78	122
L-8	2.5	28	9.67	2.35	0.66	0.85	1.70	8.25	79	122

## 4.9.3 Ground Water Quality

Groundwater is another important source of water use in vast for drinking and industrial purpose. Groundwater is one of the most valuable natural resources of livelihood and food security for millions of rural people across Bangladesh. Groundwater availability in Bangladesh is governed by its subtropical monsoon climate, aquifer storage capacity, consumption rate along with changes in

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volume and distribution of groundwater recharge conditions. Groundwater withdrawal from the shallow alluvial aquifer (depth <150 m) is the country's source of arsenic-enriched waters (Haque, 2018).

The Savar is in this common scenario. The groundwater aquifer is rich in Savar. Though industrial activity has been polluting its shallow water table. The water level of the area has been lowered 4 to 5m since the last 5 years in the vicinity of Savar about 1.0m due to increasing industrialization and urbanization (Zahid, 2020).

Previous studies and analysis of available lithologies suggests that the study area has one major aquifer system, a thick sequence Plio-Pleistocene Dupi Tila Sand, which are mostly overlain by thin to occasionally thick Pleistocene Madhupur Clay and in few places by recent floodplain sediments viz. silty clay, silt and fine sand (Khan et al., 2011; UNDP, 1982). The geological cross-section of the study area shows that the thickness of the aquitard is greater in the central portion, and smaller towards the east and west of the study area. The lack of a significant aquitard is observed in the southern and north-eastern parts. Hydrogeologically the aquifer system of the study area is semi-confined to confined in nature and transmissibility of the main aquifer varies from 855 m<sup>2</sup>/day to 1259 m<sup>2</sup>/day with a storage coefficient ranging from 0.002505 to 0.013395 (IWM and DWASA, 2006; Zahid, 2003). It is quite alarming that there has been a constant decline in the groundwater level since 2005, with the average rate of decline about 0.6 m/year. The groundwater level is relatively higher in the northern and western parts and lower in the southeastern part of the study area due to huge water extraction in Dhaka city (Ahmed et al., 2010).

**Aquifer Depth:** For the present study, Depth to aquifer varies from about 1 m to 30 m. The lower values Depth to aquifer (15 m) were found in the southern part of the Savar paurashava, and in the east of the Amin bazar and Birulia unions. In the other areas, small-to-moderate values of Depth to aquifer (3 m to 15 m) were reported. In terms of area, the five depth to aquifer categories: (1) 15 m were found to cover 1.8%, 6.2%, 54%, 33% and 5%, 332 respectively, of the total study area (Figure 4:3).

**Net Recharge:** Net recharge is the annual volume of water that penetrates the ground surface and reaches the aquifer (Edet, 2014). Most of the central part of the study area (northern part of the Savar paurashava, northwestern parts of the Shimulia and Birulia unions) had the highest Net recharge (>400 mm/year). In contrast, the areas in the west of Pathalia, the north of Ashulia, the south of Yearpur and the southeast of the Amin bazar unions had relatively lower Net recharge (400 mm/year covers 7.4% of the total study area (Figure 4:3).

**Aquifer Media:** Aquifer media determines the pore spaces and controls the flow of water within the aquifer (Aller et al., 1987). In the study area, three distinct aquifer materials that characterize the aquifer system are: (1) fine sand; (2) medium sand; and (3) coarse sand. Aquifers composed of medium sand cover the greatest area, 86% of the total study area; aquifers composed of fine sand cover 9.1% (a few patches in the Shimulia, Bhakurta, Dhamsona and Ashulia unions); and aquifers composed of coarse sand cover 4.9% (in the south of the Amin bazar union) of the total study area (Figure 4:3).

**Soil Media:** The soil constituents control the recharge potential and hence the ability of contaminants to move vertically through the vadose zone (Lee, 2003). From the soil map, it can be inferred that clay and sandy loam are the two dominant soil types in the study area, covering 37% and 36% of the total study area, respectively. The other soil types are clay loam, sandy clay

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loam and loamy sand, representing 16%, 7.8% and 3.2% of the total study area, respectively (Figure 4:3).

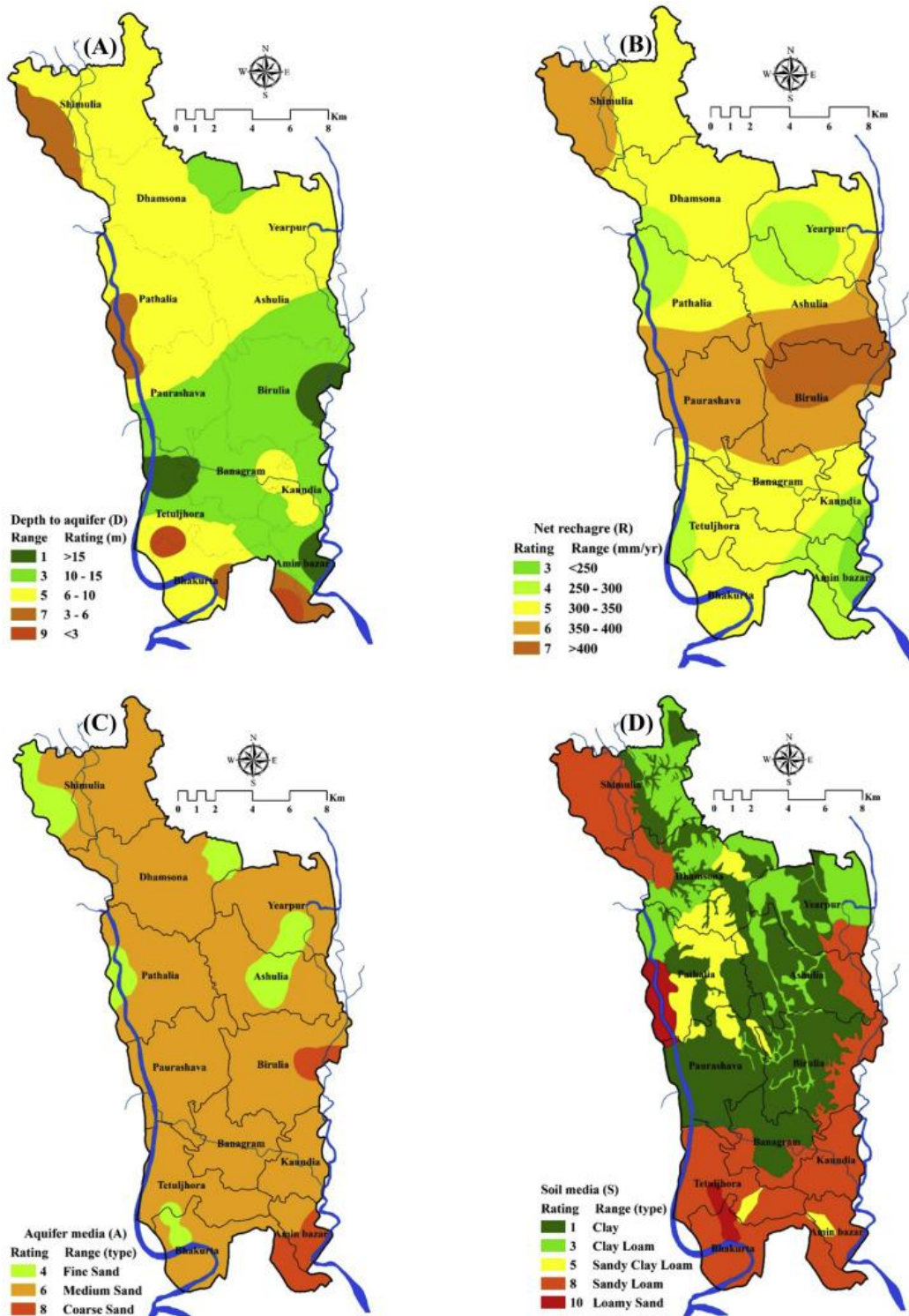


Figure 4:3 Spatial distribution map of (A) Depth of Aquifer (B) Net Recharge (C) Aquifer Media (D) Soil Media

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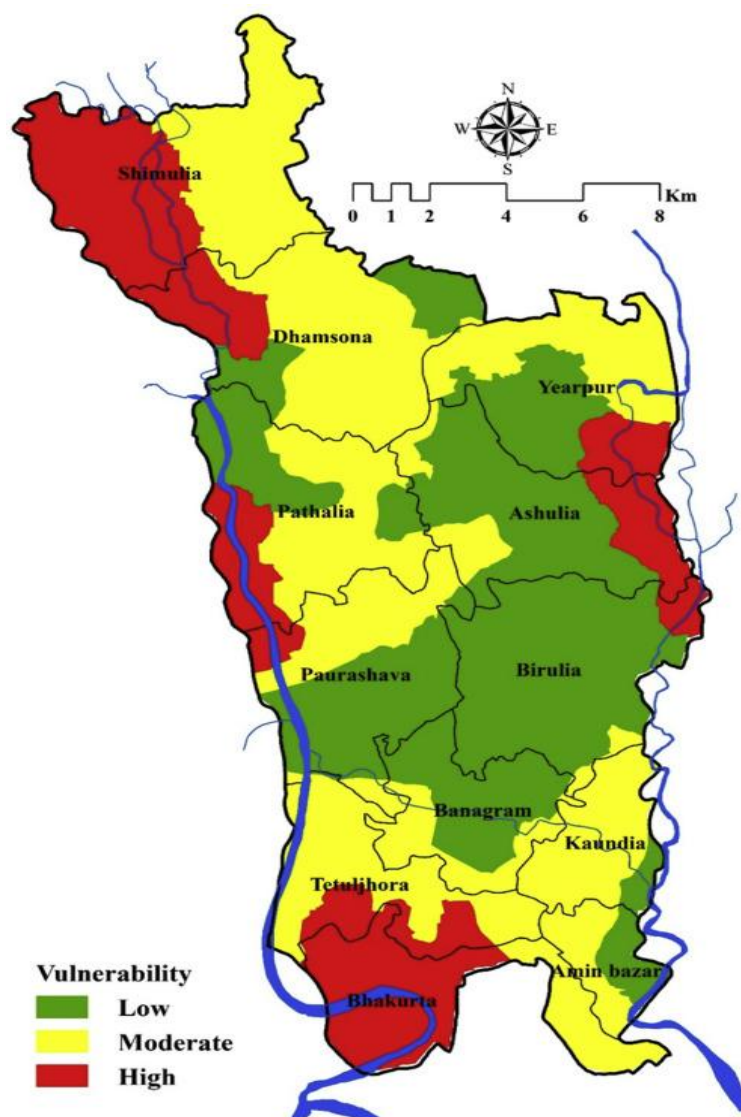


Figure 4:4 Groundwater Vulnerability Map

## 4.10 Air Quality

Air quality depends on the substances, which are present in the atmosphere in such concentrations that they produce undesirable effects on human beings, animal and plant life as well as the properties. These substances include various gases like SO<sub>x</sub>, NO<sub>x</sub>, CO, CO<sub>2</sub> etc. As well as Suspended Particulate Matter (SPM) likes Smoke, Dust, Fumes etc. and many more. Concentration of different pollutants above permissible standards can have adverse impacts on plant, animal and human life. The main contributor to this high level of air pollution is the increase in vehicular population. Fortunately, recently the Bangladesh Government has taken some strict measures through the DoE and the situation is now improving.

Besides garments and other industries, Savar accommodates the highest number of conventional brick fields emitting black smoke into the air. Therefore, the area is polluted with its surroundings

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in terms of air quality. Polluted air contains excessive Carbon monoxide (CO), Sulphur dioxide (SO<sub>2</sub>), Nitrogen dioxide (NO<sub>2</sub>), Ozone(O<sub>3</sub>) and Particulate matter (PM 2.5) and leave short- and long-term impact on people's health, as well as the environment. People, mainly infants and pregnant women among the poor, are the most exposed to such pollutants.

The factory's front road is slightly polluted due to vehicle traffic. This road is jammed at certain times of the day. Emissions from vehicles contain small amounts of various gases, such as SO<sub>x</sub>, NO<sub>x</sub>, CO, CO<sub>2</sub>, Smoke, and dust, which may contaminate the air.

A typical air quality of the Savar Upazila and Dhaka district is given in the following figure.



Figure 4:5: AQI air quality of Savar Upazila

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Historic air quality graph for Savar



Figure 4:6: Air quality of Savar Upazilla (PM 2.5)

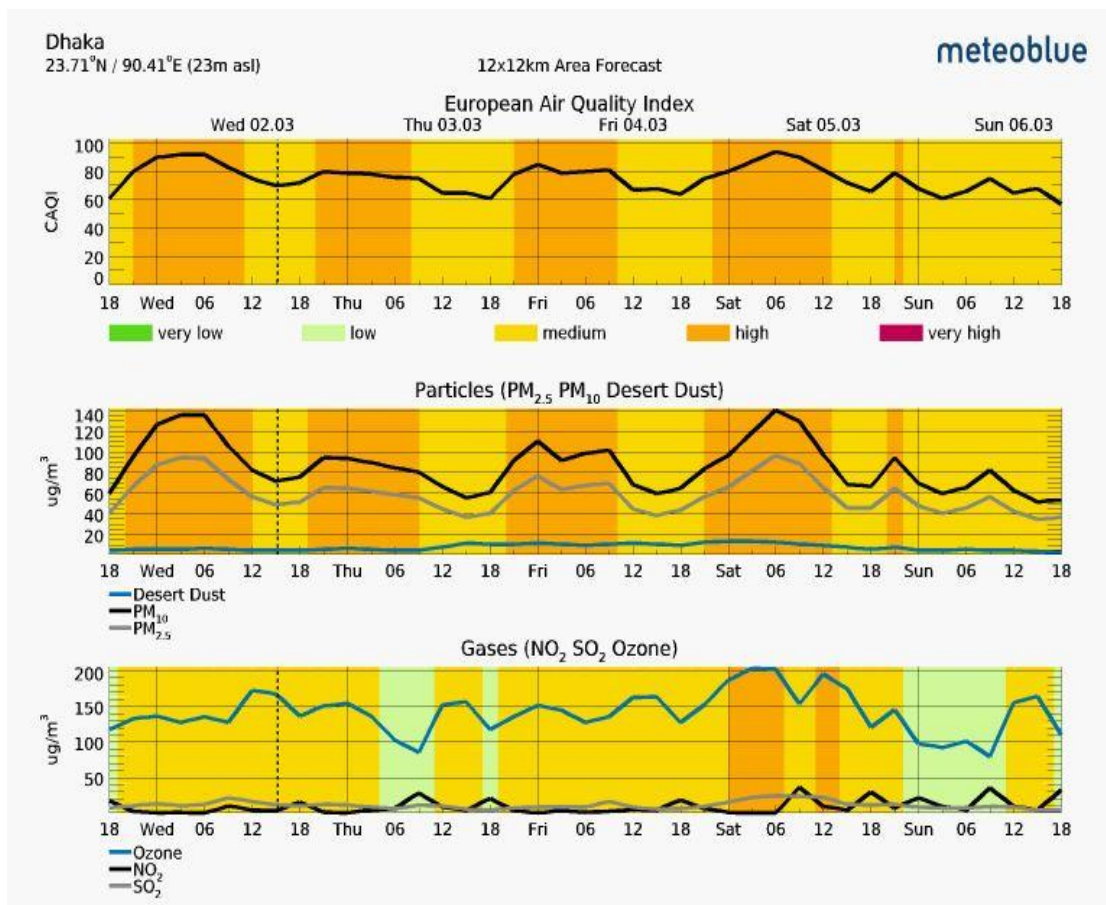


Figure 4:7: Air quality of Dhaka

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## 4.11 Meteorology

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The Savar lies on 13m above sea level. Savar upazila climate is classified as tropical. In winter, there is much less rainfall than in summer. The climate here is classified as Aw by the Köppen-Geiger system. April is the warmest month of the year. In April 2021, the average temperature in Savar was 35°C | 95 °F, pressure (mb) was 1006.3, wind speed was 16.9 kmph, and average humidity was 46%. Precipitation here is about 1990 mm | 78.3 inch per year. In January 2021, the average temperature was 25 °C | 77 °F, pressure (mb) was 1012, wind speed was 7.7 kmph, and average humidity was 40%. It is the lowest average temperature and January is considered as coldest month of the whole year (source: world weather online.com). The monthly average wind speed is 2.4 Km/day in the summer, 3.5 Km/hr. in the Monsoon and 2.9 Km/hr. in winter. The maximum wind speed occurs in July to September.

During winter season (December, January and February) the northeasterly winds prevail over the country blowing from land to sea except northern hilly areas where mainly easterly wind prevails. Clear sky, low temperatures, low humidity and light winds are the common weather phenomenon of winter season. But during the passage of upper air cyclonic circulation over northwestern part of the country (called western disturbances) light rain occurs over the country (Khatun, 2016). The average wind speed becomes high in the monsoon season and low in the dry season. This is the scenario of last ten years (*Source: BMD*).

### 4.11.1 Climate condition of the project area

The **Youngli Biotechnology Co. Ltd.** is located between 23° 54' 52" North latitudes and 90° 14' 34" East longitudes in Dhaka district. Dhaka has a tropical wet and dry/ savanna climate with a pronounced dry season in the low-sun months, no cold season, the wet season is in the high-sun months. According to the Holdridge life zones system of bioclimatic classification, Dhaka is situated in or near the **subtropical moist forest biome**. The annual average temperature is 26.1°C (79°F). Average monthly temperatures vary by 9 °C (16.2°F). This indicates that the continental type is hyper oceanic, subtype barely hyper oceanic. Total annual Precipitation averages 1875 mm (73.8 inches) which is equivalent to 1875 Liters/m<sup>2</sup> (45.99 Gallons/ft<sup>2</sup>).

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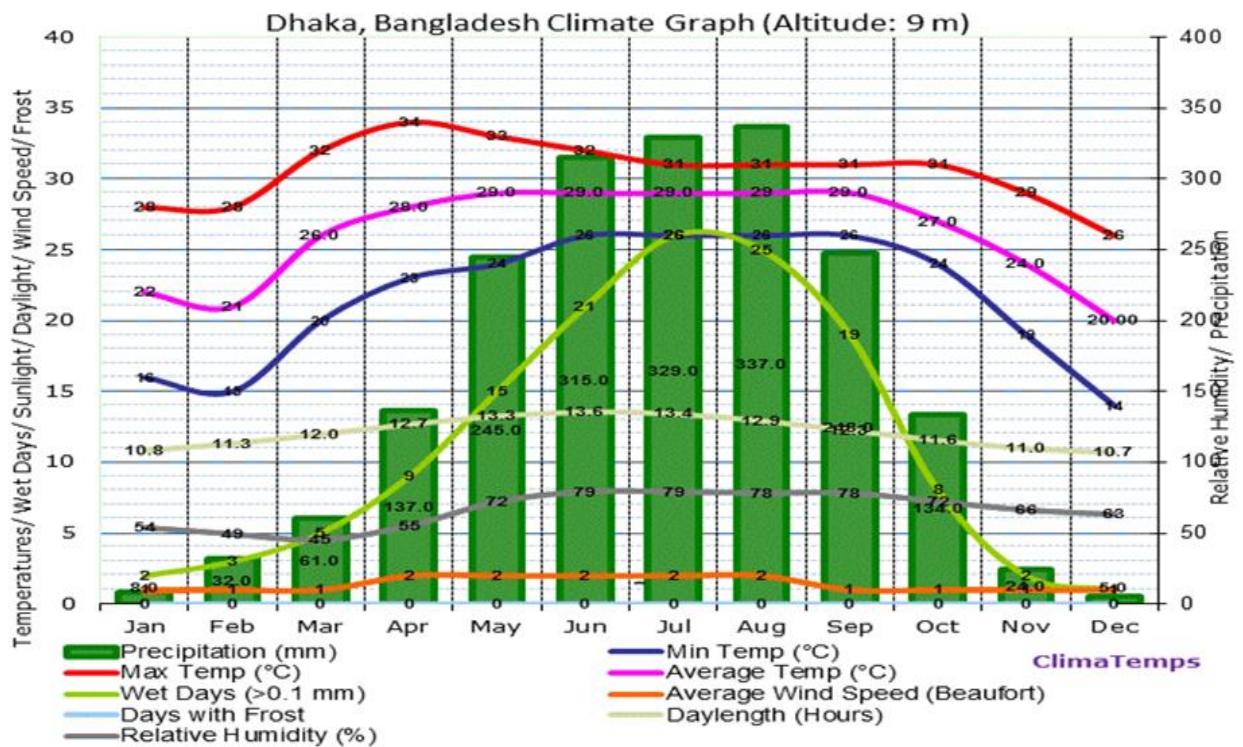
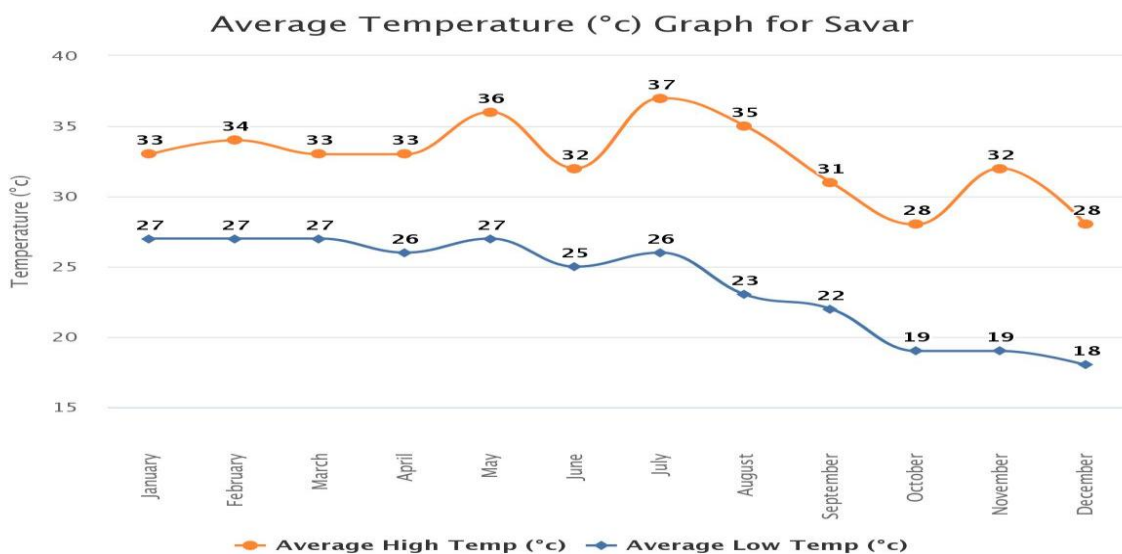


Figure 4:8 Climate graphs of Dhaka collected from <http://www.climateps.com/>

In recent years heat wave has been found due to indiscriminate cutting of trees and geographical locations. Now the highest temperature recorded in this metropolitan area is 38 degrees Celsius and lowest 12 degree Celsius. During raining monsoon, the average temperature remains 25.0 degree Celsius. In most cases, the temperature remains normal but it is known from local people that the temperature is gradually rising day by day. Especially the temperature has risen during last 5 years that normal life of people has been turning harder. The main reason of heat wave is rise of humidity in atmosphere. This will be a great barrier for future development.



# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Figure 4:9 Average annual Temperature pattern of Savar Upazila

Analyzing the trend of rain it is found that average rainfall in Savar upazilla and Dhaka district area are almost same. But more research is needed to ascertain whether this trend indicates Climatic Change. The usual rainy moon son time is getting delayed due to abrupt change of rainfall pattern. The average rain fall over the year is given below:

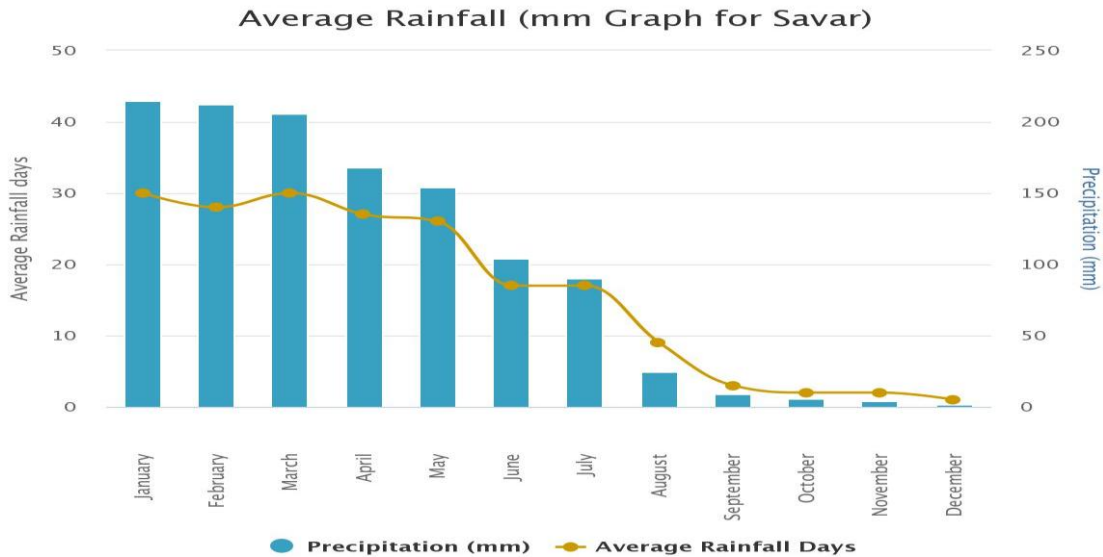


Figure 4:10 Average annual Temperature Pattern of Savar Upazila

Wind blows from southwest and southeast during pre-monsoon and monsoon season, from Northwest and Northeast during the post-monsoon and dry season. Between mid-April and early June, and between mid-September and mid December high wind velocity are experienced. The average wind speed over the year in the project is given below:

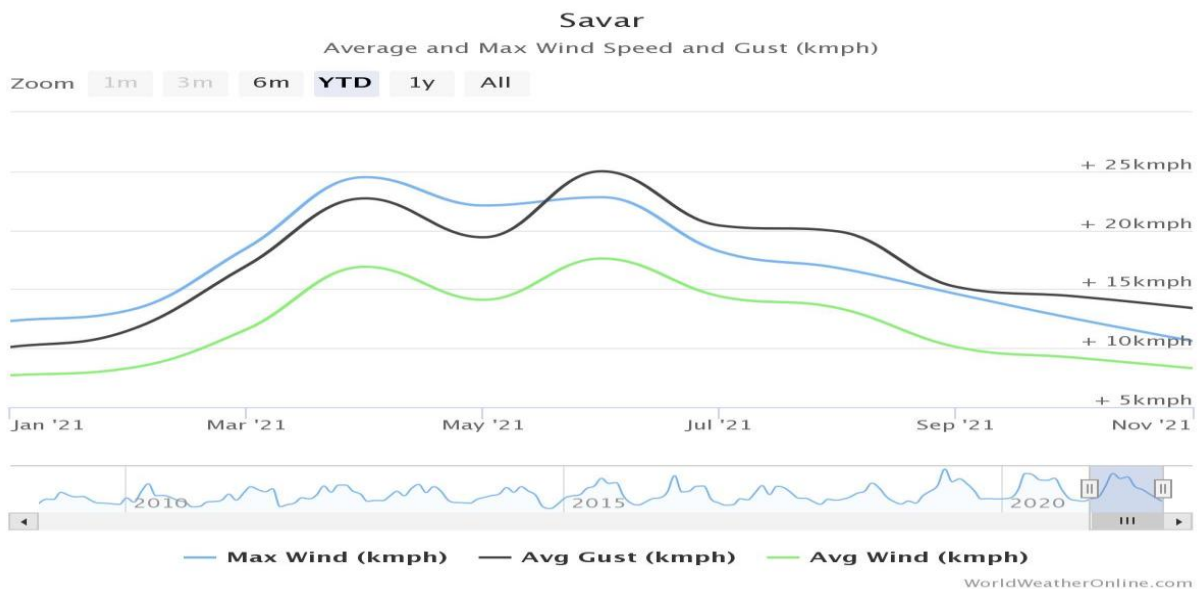


Figure 4:11 Average annual wind speed of Savar Upazila

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

According to the statistics shows that average humidity goes up between June and October close to 80% other side it goes down rest of the months. The average humidity over the year is given below:

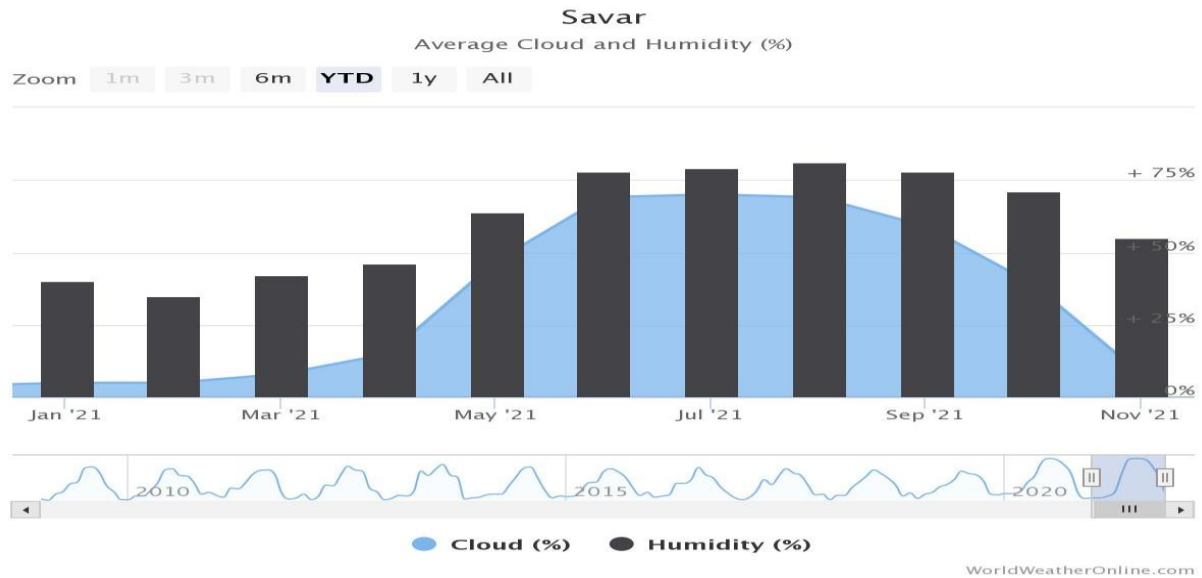


Figure 4:12 Average annual Humidity and Cloud pattern of Savar Upazila

The graphical data indicates increase in the atmospheric pressure from January to December.

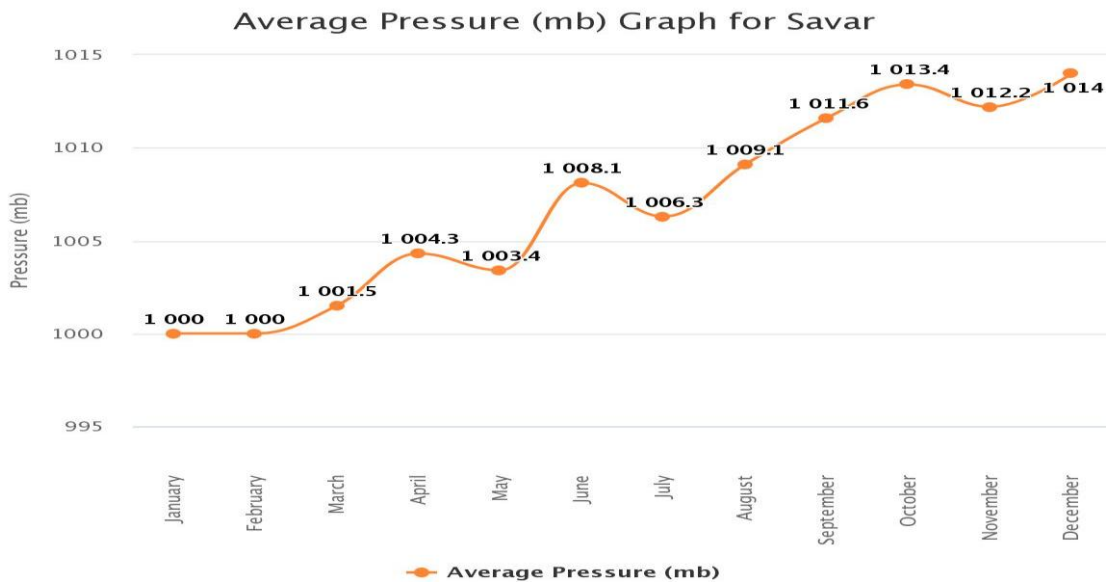


Figure 4:13 Average annual Pressure of Savar Upazila

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

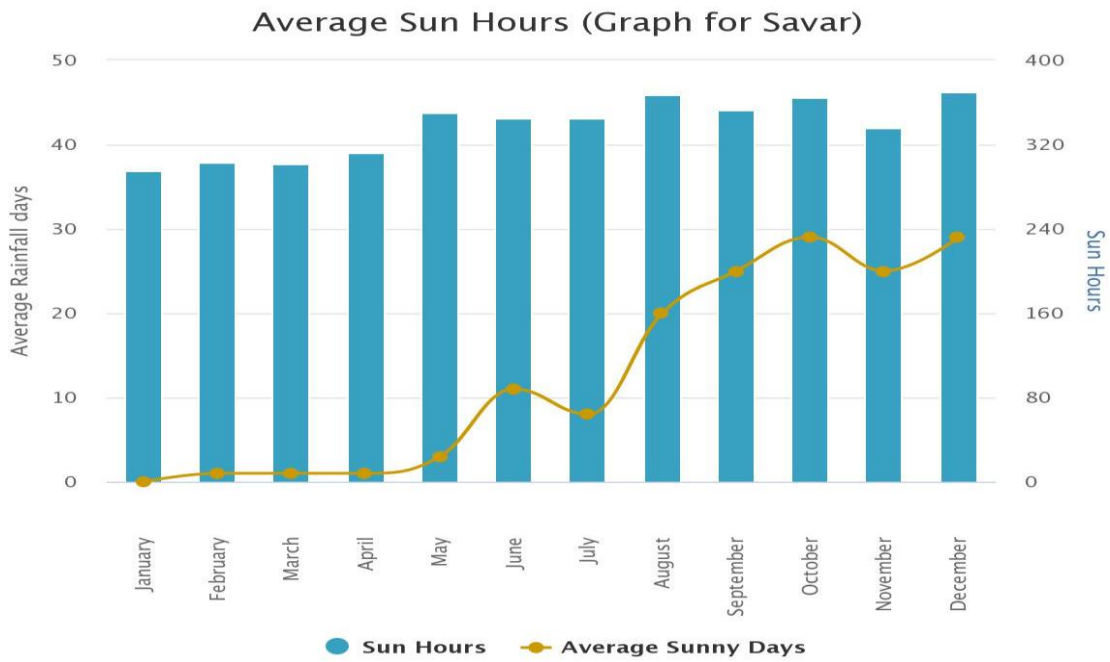


Figure 4:14 Average annual Sun hours of Savar Upazila

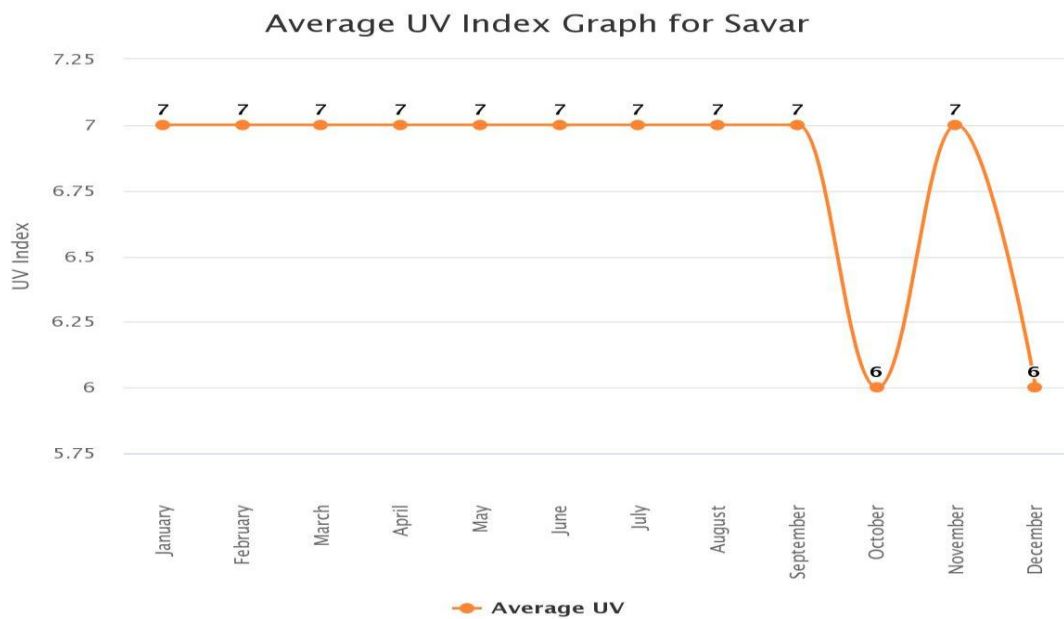


Figure 4:15 Average annual UV Index of Savar Upazila

Air pollution, smog, fog affects the visibility range. The following graph shows average visibility of Savar upazila.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

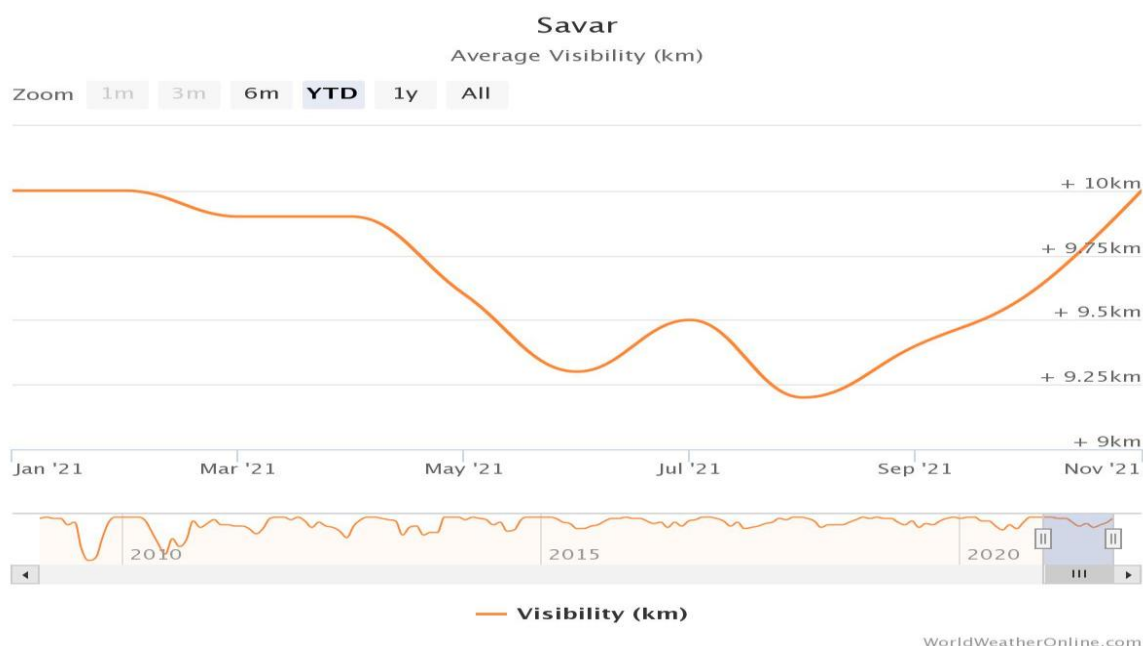


Figure 4:16 Average annual Visibility of Savar Upazila

## 4.12 Noise

Noise is an important part of the environment. The World Bank and Bangladesh have different recommended values for noise standards. The level of noise at the project is not detected and too much noise level data near the project is not found. Now, the project area is quite silent. After the construction, sophisticated machineries will be installed in the project area when the industries will be set up after allocation, which will produce little significant noise.

Noise is an unwanted sound. The difference between sound and noise depends upon the listener and the circumstances. Noise is one of the most common occupational health hazards. Noise at the workplace that exceeds the exposure standard and is not controlled is a major cause of hearing loss to workers. A significant loss of hearing contributes to social isolation and reduced quality of life, career prospects, increased absenteeism, worker turnover, and lowered work performance. It can also contribute to workplace injuries and accidents. The generators are encompassed by a soundproof shed. So, no noise pollution occurs from generators in the project area.

Table 4-5 Noise Level around the project site

Sampling Point	Latitude	Longitude	Sound Level (Day Time)	Sound Level (At Night)
1	2647406.87 m N	219176.44 m E	56.6 dBa	20.0 dBa
2	2647450.94 m N	219158.64 m E	55.6 dBa	22.0 dBa
3	2647519.17 m N	219188.15 m E	60.6 dBa	19.7 dBa
4	2647568.84 m N	219240.27 m E	58.6 dBa	21.5 dBa
5	2647360.42 m N	219257.43 m E	57.6 dBa	20.0 dBa

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

6	2647534.75 m N	219419.77 m E	60.6 dBa	18.0 dBa
7	2647450.44 m N	219410.80 m E	62.5 dBa	15.5 dBa
8	2647401.37 m N	219351.34 m E	59.0 dBa	20.0 dBa
<b>Standard Limit</b>		<b>Below 75 dBa</b>		<b>Below 70 dBa</b>

## 4.13 Seismicity

Bangladesh, a densely populated country in South Asia, is located in the north-eastern part of the Indian sub-continent at the head of the Bay of Bengal. Tectonically, Bangladesh lies in the north-eastern Indian plate near the edge of the Indian craton and at the junction of three tectonic plates—the Indian plate, the Eurasian plate, and the Burmese micro plate. These form two boundaries where plates converge—the India-Eurasia plate boundary to the north forming the Himalaya Arc and the India-Burma plate boundary to the east forming the Burma Arc.

Active faults of regional-scale capable of generating moderate to great earthquakes are present in and around Bangladesh. These include the Dauki fault, about 300km long trending east-west and located along the southern edge of Shillong Plateau (Meghalaya- Bangladesh border), the 150 km long Madhupur fault trending north-south situated between Madhupur Tract and Jamuna flood plain, Assam-Sylhet fault, about 300km long trending north east southwest located in the southern Surma basin and the Chittagong-Myanmar plate boundary fault, about 800km long runs parallel to Chittagong-Myanmar coast.



Figure 4:17 Regional tectonic setup of Bangladesh with respect to plate configuration

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Dhaka is situated in the central part of the country on the bank of the Buriganga River and at the southern tip of the Madhupur Tract dating back to the Pleistocene age. The Madhupur Tract is an area of recent uplift within the delta and the surface of the tract is in general higher on the west, sloping very gently eastward to disappear beneath younger sediments (Fergusson, 1863; Morgan and McIntire, 1956). Dhaka is surrounded by the old Brahmaputra floodplain in the north and east, by the Ganges-Meghna flood plain in the south, and by the Jamuna flood plain in the west. Dhaka is slightly elevated above the surrounding floodplains and represents mostly flat land with minor undulations. Topographically Dhaka is of low relief with many low depressions. According to (Alam, 1988), the Madhupur Tract is structurally controlled. The Pleistocene sediments of Madhupur Tract have been affected by numerous episodes of faulting. These faults are probably the branch-out surface faults from the low dipping western extension of the Burma Arc detachment fault. Dhaka lies within 50 to 500km distances from the seismogenic faults and sits on the Burma Arc detachment fault.

Based on earthquake epicenters and morpho-tectonic characteristics, Bangladesh is divided into three seismic zones, namely zone-I, zone-2, and zone-3 (Table 6.7). The northeastern folded regions of Bangladesh are the most active zone and it belongs to zone-I. Zone-II consists of recent uplifted Pleistocene blocks of the Barind and Madhupur Tract and the western extension of the folded belt. Southwest Bangladesh is referred to as zone-III and it is a seismically quiet zone. The Bask coefficients of these three zones are 0.08, 0.05, and 0.04, respectively.

Table 4-6 Seismic zones of Bangladesh

Zoning	Area Mercalli Scale
I	North and eastern regions of Bangladesh (Seismically most active)
II	Lalmai, Barind, Madhupur Tracts, Dhaka, Comilla, Noakhali, and western part of Chattogram Folded belt.
III	Khulna division S-E Bangladesh (Seismically relatively quiet)

**The factory will be located in Zone-II** of earthquake zones (Figure 6.19) which is a seismically moderate risk zone. During seismic or earthquake delineation, ground condition (firm or soft) has not been taken into consideration in Bangladesh. Though the project is located within zone- II special precaution is needed in considering the risk from earthquakes.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

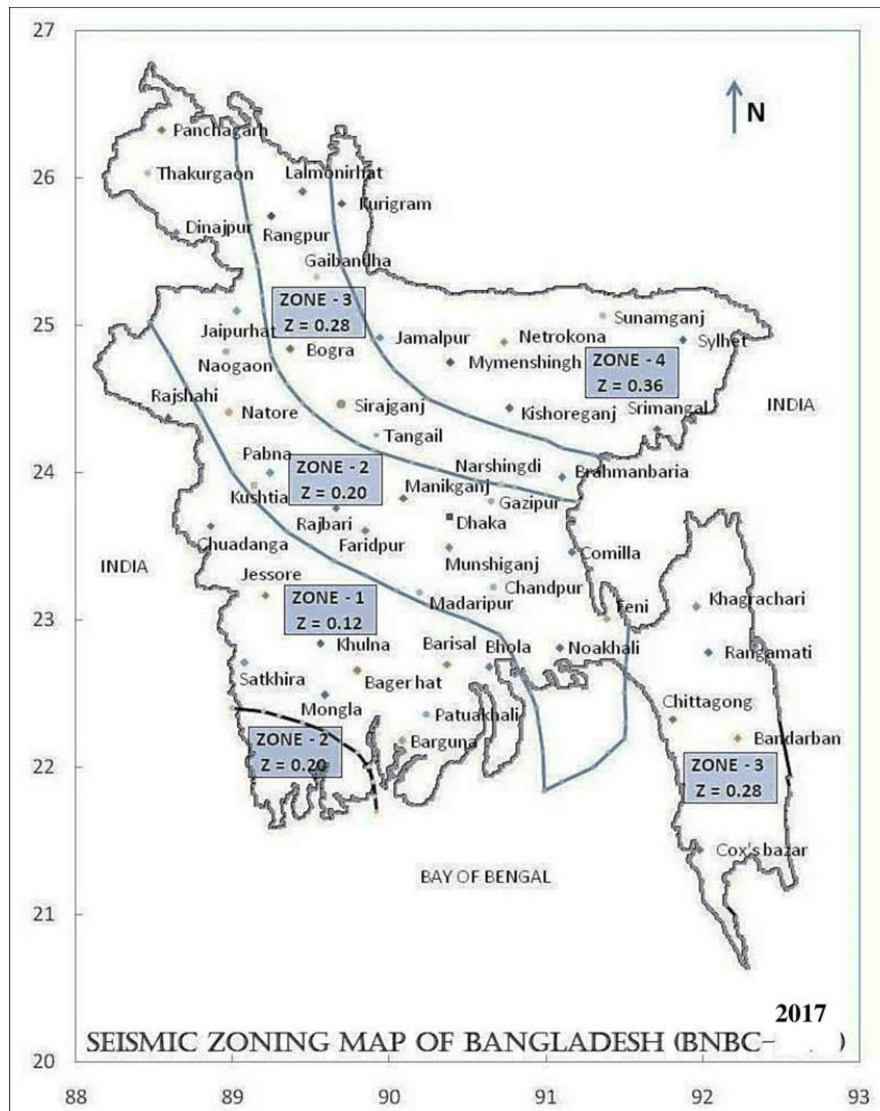


Figure 4:18 Earthquake zones of Bangladesh

## 4.14 Ecological Baseline

### 4.14.1 Introduction

The ecological baseline is the ecological value of a site before construction works are undertaken. It can be compared to the ecological value of the site after construction works are complete to determine where there have been changes. The survey of the ecological status is the first step of the implementation. This study has two main outputs: In one hand it is a baseline for the monitoring of the ecological result of the project. In the other hand it provides data for the Environmental Impact Assessment (EIA).

The survey cover the whole target area from the terrestrial habitats to the water body, including either the Hungarian or the Croatian side regarding to the fact that the habitats are divided only by the state border.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

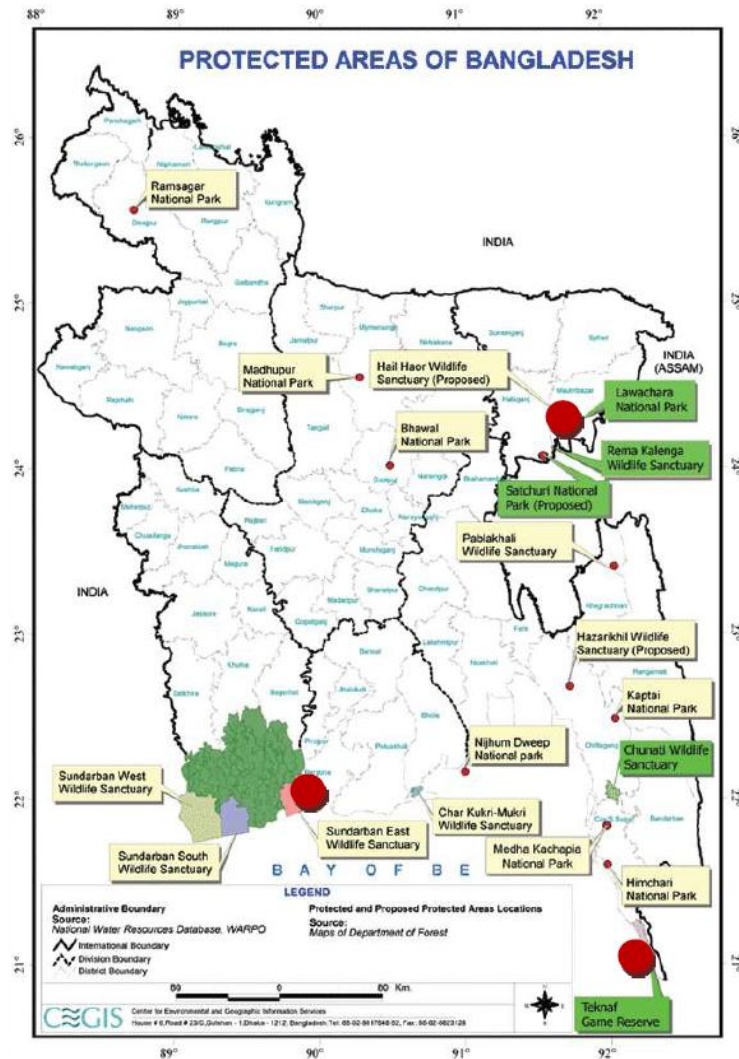


Figure 4:19 Protected Areas of Bangladesh

## 4.14.2 Ecological and Conservation Designations

### 4.14.2.1 Overview

There are 19 protected areas in Bangladesh, covering 2,458 sq. km and representing 1.68% of the land area (FD record as on July 2007). The Forest Department has the mandate for the management of these protected areas. The protected areas are declared in the country under the “Bangladesh Wildlife (Preservation) (Amendment) Act, 1974”. The protected areas are divided into following categories-

### 4.14.2.2 National Parks

A National Park is a relatively large area of scenic and natural beauty created to preserve scenery, flora, and fauna in a natural state and allow public access for recreation, educational, and research purposes. There are 10 national parks in our country.

**No National Parks are located near the project site.**

### 4.14.2.3 Wildlife Sanctuary

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

A Wildlife Sanctuary is an area closed to hunting, shooting, or trapping wild animals and maintained undisturbed for wildlife breeding. Vegetation, soil, and water are protected from public interference. There are 8 wildlife sanctuaries present.

**No Wildlife Sanctuary is located near the project site.**

#### 4.14.2.4 Game Reserves

Game Reserves are created to protect wildlife and increase their number where capturing wild animals is unlawful. There is only one game reserve in our country: Teknaf Game Reserve, Cox's Bazar, which has an area of 11,615 ha and was notified in 1983.

**No Game Reserve is located near the project site.**

#### 4.14.2.5 Ecologically Critical Area

An Ecologically Critical Area (ECA) is an environmental protection zone in Bangladesh. In 1995, specific areas in Bangladesh could be deemed Ecologically Critical Areas as a result of the Environmental Conservation Act.

Bangladesh has a wide variety of ecosystems that include over 300 rivers that creates marine and fresh water environments. There are a multitude of areas that have been considered ECAs. Cox's Bazar is on the border of Bangladesh and Myanmar in the southeast corner of Bangladesh. The Teknaf Peninsula is 80 km of sandy beach and holds a variety of species as one of the longest beaches in the world. The Sonadia Islands are home to some of the last mangrove forests that house distinct species that can tolerate the high salinity of the mangrove forests in this area. The Sundarbans also contain mangrove forests and was named an ECA because it continues to suffer from over-exploitation and illegal urban development. St. Martin's Island is known for its coral-algal that overwhelms its rocky reefs. The island is a refuge for globally threatened marine species. Finally, the Hakaluki Haor found in greater Sylhet is an ECA because it has an extensive amount of wetland habitats that support a wide variety of life.

Gulshan-Baridhara Lake was declared an ECA in 2001. In September 2009, the four rivers around the capital city Dhaka—Buriganga River, Shitalakshya River, Turag River and Balu River—have been declared by the Department of Environment as ECAs.

**The project site does not locate in any Ecologically Critical Area.**

#### 4.14.2.6 Eco Park

Eco Park a short form of Ecological Park. It is exploited as an amusement park without hampering its natural environment so that the bio-diversity remains unaffected there. Generally, a particular area of a forest is demarcated and brought under intensive management for this purpose. Sometimes forest areas having special natural features are selected as eco parks. Flora of the concerned area gets preference for such consideration. However, protection and preservation of both flora and fauna get top priority. Beauty offered by the nature is opened to the visitors. Moreover, efforts to attract and entertain the visitors are also visible in the Eco parks.

Eco Park is not only a mere component of forest management. It facilitates to enjoy the beauty of the jungles as well as to acquire firsthand knowledge on its ecology, particularly the growth and development of flora and fauna. Eco Park also helps to increase public awareness about the necessity of maintaining bio-diversity. The Department of forest has set up nine eco parks

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

throughout Bangladesh considering their natural beauty and specific features like geographical location. These are: Sitakunda Botanical Garden and Eco Park, Bashkhali Eco Park, Madhavkundo Eco Park, Madhutila Ecopark, Bangabandhu Jamuna Eco Park, Kuakata Eco Park, Tilagarh Eco Park, Jafflong Garden Park and Barshijora Eco park.

**The project site does not locate in any Eco Park Area.**

## 4.15 Terrestrial Ecology

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### 4.15.1 Flora

The flora of the Dhaka district is largely similar to that of other adjoining districts. This district was thickly populated by many indigenous plants now that unique vegetation has been greatly reduced due to random and ruthless destruction of vegetation for increasing human habitation.

The main agricultural crops are rice, jute, wheat, sugar cane, vegetables, oil seeds, tobacco, spices etc. Rice is the dominant agricultural crop. Among the rice crops, boro covers the largest area followed by amon and aus (Census of Agriculture 2008). Jackfruit is extensively grown and is an important cash crop.

The common varieties of trees that are found in the district are khejur (*Phoenix sylvastris*), plam (*Borassus flabellifer*), black berry (*Syzygium cumini*), baroi (*Zizyphus mauritiana*), starapple District (*Syzygium malaccaensis*), pitraj (*Aphanamixls polystachia*), mango (*Mangifera indica*), guava (*Psidium guava*), sajna (*Moringa oleifera*), bahera (*Terminalia bellirica*), neem (*Azadirachta indica*), kadam (*Anthocephalum cadamba*), palash (*Butea monosperma*), hijal (*Barringtonia acutangula*), mariad (*Tamarindus indica*), bel (*Aegle marmelos*), jackfruits (*Artocarpus heterophyllus*), mandar (*Erythrina variegata*) coconut (*Cocos nucifer*), kamranga (*Averrho karambola*), bat (*Ficus indica*) etc. Various kinds of herbs, shrubs and orchids also grow here abundantly.

Besides, there are several gardens in the Dhaka city in which many interesting and rare plants local or foreign have been planted and maintained. Of these gardens, balda garden at batkhola road is very interesting. The collections of the orchids, ferns, cactus and nymphaea are particularly rich in this garden. The rare plants are agor plant, australian acacia, michaelia champaka, magnolia grandoflora, century plant, cammelia japonica and the like.

The Botanical garden of Dhaka University, though small, is quite rich in plant collections.

A few plant species occurring in the Ramna Park are akashmoni, kanchan, mahua, keya, basanti, ceylon oak, sutana champa, australian acacia etc. moreover, mirpur botanical garden has some rare plants, such as rose of venezuela, bread fruit, karpur, african tulip, devil's tree, kurchi, nagalingam, tree of heaven, cashew nut etc.

### 4.15.2 Fauna

**Mammals:** Of primates, the rhesus monkey (*Macaca mullata*) is fairly common in the district, Until recently, a large number of monkeys were seen frequently jumping around in the Dhaka city. They have now retreated to the city and far beyond. Other mammals that are commonly found in this district are: Bengal Fox (*Vulpes bengalensis*), Jackal (*Canis aureus*), grey mongoose (*Herpestes edwardsi*) etc.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Bats are represented by a few species' including India fruit bats. At times, porpoises are seen in the rivers of the district. Rodents are represented by different species of squirrels, rats and mice.

**Birds:** The common birds of the district include bhat shalik (*Acridotheres tristis*), house sparrow (*Passer domesticus*), magpie robin (*Copsychus saularis*), black drongo (*Dicurus macrocercus*), spotted dove (*Streptopelia chinensis*), lesser golden backed woodpecker (*Picus myrmecops*), white breasted kingfisher (*Alcedo atthis*), pond heron (*Ardeola grayii*), little cormorant (*Phalacrocorax niger*), white breasted water hen (*Amaurornis phoenicurus*), rose ringed parakeet (*Psittacula cupatria*), common hawk cuckoo (*Cuculus microplerus*), tailor bird (*Orthotomus sutorius*), koel (*Eudynamis scolopacea*), barn owl (*Tyto alba*), house crow (*Corvus splendens*), brahmyni kite (*Haliastur Indus*). The smaller and song birds include the bush lark, halde pakhi, (*Oriolus xanthornus*) weaver bird, shrike, warblers, purple sun bird etc.

In addition, a large number of migratory birds are found here during winter specially in Jahangirnagar University. They include most of the waders including the sheld duck (*Tadorna tadorna*), greyleg goose (*Anser anser*), little ringed plover (*Charadrius dubius*), pintail (*Anas acuta*), fantail sinpe (*Gallinago stenura*), brahmyni duck (*Tadorna ferruginea*), common teal (*Anas crecca*), common pochard (*Aythya ferina*), grey wagtail (*Motacilla cinerea*), brown shrike (*Lanius cristatus*), pied harrier (*Circus melanoleucos*), common turn (*Sterna birusdo*), herring gull (*Larus argentatus*), marsh harrier etc.

**Reptiles and Amphibians:** Different species of fresh water tortoises and turtles such as pond tortoise (*Melanochelys trijuga*), reacock soft shell turtle (*Trionyx hurum*), common roof turtle species of lizard like house lizard (*Hemidictylus brooki*), wall lizard (*Hemidictylus frenatus*), yellow water monitor (*Varanus flaviscens*), striped skink, grey land monitor etc. are also found. The poisonous snakes include common cobra (*Naja naja*), rat snake (*Ptyas mucosus*), common krait (*Bungarus caeruleus*), banded krait (*Bungarus fasciatus*) and common blind snake.

Amphibians like skipper frog (*Rana cynophycis*), bull frog (*Rana tigerina*), cricket frog (*Rana limnocharis*) and toad (*Bufo melanosticus*) are also found in this area.

**Fishes:** Fishes are caught in the ponds, rivers, creeks and beels of the district. The popular edible fishes are hilsa (*Hilsa ilisha*), ruhi (*Labeo rohita*), catla (*Catla catla*), mrigel (*Cirrhinus mrigala*), kalbaush (*Labeo calbasu*), sarapunti (*Puntius sarana*), chital (*Notopterus chitala*), airh (*Mystus aor*), pabda (*Ompok pabda*), bacha (*Eutropichthys vacha*), pangas (*Pangasius pangasia*), koi (*Anabas testudineus*), shing (*Heteropneustes fossilis*), magur (*Clarius batrachus*) etc. Beside fish, invertebrates like prawn (*Palaemon carcinus*), shrimp (*Palaemon malcolmsoni*) and crabs are also available here.

Moreover, some exotic fishes like telapia (*Oreochromis mossambicus*), nilotica (*Oreochromis niloticus*), silver carp (*Hypophthalmichthys molitrix*), and grass carp (*Cteopharyngodon idella*) etc. have also been introduced in the district.

**No trace of aquatic flora and fauna is found around the project location because this area mainly commercial, residential and industrial area.**

## 4.16 Socio-Economic Condition

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**Main Crops:** Paddy, jute, wheat, potato, peanut, onion, garlic, chilly, ginger, betel nut, pulse, corn, sugarcane, vegetables etc. are main crops of this district.

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**Main Fruits:** Mango, jackfruit, papaya, guava, olive, coconut, kul and banana etc. are main fruits of this district.

**Manufacturing Industries:** Ceramic industry, beverage industry, press and publication, garments industry, foot ware, jute mills, textile mills, printing and dyeing factory, transformer industry, automobile industry, biscuit and bread factory, pharmaceutical industry, cosmetic industry, soap factory, rice mill, flour mill, ice factory, ball pen industry, polythene industry, saw mill, brick field, cold storage, welling, plant nursery, etc. are main sectors of manufacturing industries of this district.

**Economic Situation:** Main sources of income Agriculture 23.94%, non-agricultural laborers 2.66%, industry 0.89%, commerce 14.81%, transport and communication 4.16%, service 14.01%, construction 2.06%, religious service 0.18%, rent & remittance 19.96% and others 17.33%. The economy of Dhaka rural area is agro-based and Dhaka urban area is industry based. Out of total 2,266,479 holdings of the district 10.65% holdings are farms, which produce varieties of crops, namely, local and HYV rice, wheat, jute, tobacco, potato vegetables, spices, pulses etc. Various fruits like mango, jackfruit, lichee, black berry, palm betel-nut, banana etc. are the main fruits of the district. Varieties of fish are caught from rivers, beels and paddy fields during rainy season. The most common fishes are ruhi, katla, mrigel, magur, singi, koi, puti, shoil, gazar, boal, etc. All these fishes are economically valuable. Besides these common varieties, some other well-known varieties of fish are pangash, airh, bacha, rita batasi, khalisha and chingri are found. Besides crops, livestock and poultry are the subsidiary source of household income of the district.

Enormous amount of socio-economic activities is present near the industrial site. People are engaged in wide variety of occupation in industrial, commercial, transportation and various other sectors. In this industrial area people from different cultural and religious background live, work and worship peacefully. Due to the establishment of the resort people were not removed from the site or people were not affected. Multi-disciplinary activities/business has been generated aiming to the establishment of this resort and as such a number of people have engaged in the activity of the resort to run their livelihood. The resort itself employed a large number of people, skilled and unskilled, during operational phase. Many local people have been benefited directly or indirectly for the establishment of the resort through employment and other activities.

## 4.17 Historical Monuments and Archeological heritage

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A total of 13 ancient archaeological sites have been discovered at Savar. These are as follows

1. Raja Harish Chandrer Badi
2. Sulia
3. Rajasan,
4. Kotbadi,
5. Gandaria,
6. Karnapada,
7. Kalma
8. Madanpur
9. Dagar Mura
10. Mathbadi

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

11. Fulbadi
12. Konda
13. Pathalia (Jahangirnagar University Campus).

These fall into three categories: administrative, religious, and pottery or residential sites. All the sites are found in and around Savar and on the eastern side of the Bangshi (Source: Banglapedia).

A number of ancient ponds can also be found in this area. Local legends suggest that King Harish Chandra excavated 50 ponds in a single night. Of these, the names of 30 ponds are known from different pieces of literature. These are Sagar Dighi (near Raja Harish Chandrer Badi), Raj Guru's pond, Chhota Khuda, Bara Khuda, Kumaria pond, Dakaitmara pond, Jor pukur, Niramis pukur, Kodaldhoya pukur, Giyas pukur, Satini pukur, Amis pukur, Doyatdhoya pukur, Raj Dighi, Sukh Sagar, Khataishya pukur (near Kalma), Jalori pukur, Ban pukur, Chhobangara pukur, Lal pukur, Satpukuri pukur, Chhaiyal pukur, Jaleshvari pukur, Pitkila pukur, Choti Mara pukur, Andar pukur, a second Kodaldhoya pukur, Budir Bagh pukur, Yogir pukur (at Jahangirnagar University Campus) and Moor pukur. Most of these ponds have now been silted up by natural processes or have been brought under human habitation (Source: Banglapedia).

**There are not any historical sites or structures of archeological paleontological or architectural significance within the factory areas.**

## 4.18 Tribal communities

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According to the BBS census 2011, ethnic minority group nationals numbered 319 including Buno, Garo, Chakma (Sangma), and Burman live in Savar Upazilla.

## 4.19 Life Style

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Life style of people near about the factory area is progressing because this area is gradually developing and expanding of job opportunity for local people.

## 4.20 Settlement and Housing

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As the project area is a combined community of residential, commercial and industrial zone, people of various economic status lives in this area. All sorts of settlements and housing have already been established in the resort surroundings. Working people of different sectors live in this area. At the same time socio- economic activities will also be increased with money flow and activities of the newly settled working people of this project. The services include infrastructure such as water, garbage collection, sanitation, electricity, roads and drainage etc. will need to be improved. The concerned authority of the Local Body and the proponent will assist to improve service facilities of the area. So, there is no question of evacuation of settlement and housing in the project area.

## 4.21 Traffic and Transport

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The factory is connected to Dhaka-Ashulia Highway. Traffic and transport facilities are good on the project site.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 4.22 Socio-economic and cultural environments

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Enormous amount of socio-economic activities is present near the project site. People are engaged in wide variety of occupation in health services, commercial, transportation and various other sectors. In this area people from different cultural and religious background live, work and worship peacefully

## 4.23 Terrestrial Ecology

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### 4.23.1 Flora

In 2025, the flora of

#### [Ashulia, Savar Sadar](#)

(22°39'05.0"N 92°09'56.1"E) is characterized by a mix of tropical evergreen and semi-evergreen hill forests, substantial homestead biodiversity, and the unique aquatic ecosystem of Ashulia Water body.

### 1. Terrestrial and Aquatic Vegetation

- **Terrestrial Flora:**
  - **Natural Forests:** Dominated by timber-yielding and food-source genera such as *Tectona* (Teak), *Dipterocarpus* (Garjan), and *Artocarpus* (Jackfruit).
  - **Homestead Areas:** Surveys in Ashulia, Savar Sadar identify over **163 plant species**, including timber (8%), fruit (20%), medicinal (12%), and ornamental plants (34%). Common domestic species include Mango (*Mangifera indica*), Areca nut, and Coconut.
- **Aquatic Flora:**
  - **Ashulia Water body Ecosystem:** The water body supports various aquatic macrophytes and provides a habitat for freshwater fish and prawns.
  - **Vascular Plants:** Studies of the nearby Karnafuli River identify 128 vascular species, including many Pteridophytes (ferns) and Monocots.

### 2. Endangered Species (IUCN Red List 2025)

As of late 2024–2025, Bangladesh has released its first comprehensive **Plant Red List** assessing 1,000 species.

- **Critically Endangered (CR):** Five species identified for priority conservation include the **Bulborox orchid** (*Bulbophyllum roxburghii*), **Small-bulb orchid**, **Dwarf date palm**, **Chaulmoogra**, and **Bashpata**.
- **Endangered (EN):** Includes species like *Mangifera sylvatica* (Wild Mango) and *Saurauia armata*.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- **Vulnerable (VU):** Many hill forest species, such as *Colona flagrocarpa*, are categorized as vulnerable due to habitat loss.

## 3. Biomass and Density Assessment

- **Vegetation Density (NDVI):** Historical data indicates a decline in peak NDVI values from 0.72 to 0.47 in some regions, reflecting a roughly **18–24% decrease** in vegetation cover due to urbanization and land-use change.
- **Biomass Status:**
  - Ashulia, Savar remains a vital biomass fuel source, with homestead forests contributing significantly to urban household energy and food security.
  - **Soil Erosion Link:** High erosion risks (34.1% of the area at severe risk) directly impact biomass sustainability by degrading the soil required for dense vegetation growth.



Bash pata (*Podocarpus nerifolius*). Image by Shirmanto Dipu.



Chaulmoogra (*Hydnocarpus kurzii*). Image by Enamur Rashid.

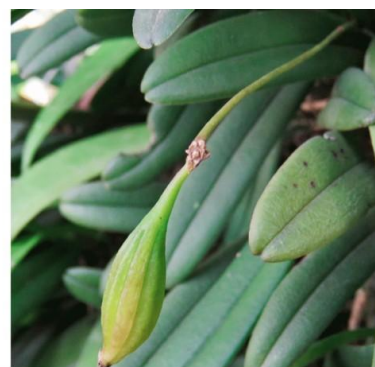


The small-bulb orchid *Bulbophyllum oblongum*. Image by Gazi Mosharof Hossain.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)



Bulbophyllum oblongum flower and fruit. Image by Gazi Mosharof Hossain.



Bulborox orchid (Bulbophyllum roxburghii). Image by Gazi Mosharof Hossain.



Dwarf date palm (Phoenix acaulis). Image by Gazi Mosharof Hossain.

- Bangladesh is attempting to conserve and nurture five critically endangered flora species to ensure their healthy population in nature. Currently, these plants are present only in some specific places in the country.
- The species are the bulborox, small-bulb orchid, dwarf date palm, chaulmoogra and bashpata, which are identified as critically endangered in the latest Plant Red List of Bangladesh.
- The Bangladesh Forest Department has taken the initiative to increase the plants' numbers by cultivating them in the National Botanical Garden and the National Herbarium before planting them in suitable habitats.

Among the Reptiles Slender coral snake (*Callophis melanurus*), Green pit viper (*Trimeresurus gramineus*), Banded krait (*Bungarus fasciatus*), Ring lizard (*Varanus salvator*) are widely available. The amphibian species found in this zone include Ornate microhylid (*Microhyla ornata*), Bull frog (*Hoplobatrachus tigerinus*) (Nishat et al., 2002).

Sl. No.	Local Name	Status	Sl. No.	Local Name	Status
1	Tezpata	Common	12	Narikel	Common
2	Amgas	Common	13	Jambura	F. Common
3	Kathal	Common	14	Tetul	F. Common
4	Supari	Common	15	Lukluki	F. Common
5	Lichu	Common	16	Jalpai	Rare
6	Khezur	Common	17	Tal	Rare
7	Satni	Common	18	Kamla	Rare
8	Kalagas	Common	19	Anarosh	Rare
9	Lebu	Common			
10	Bel	Common			
	Peara	Common			

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

11			
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## References for 2025 Data

- **Plant Red List:** [IUCN Red List of Plants \(2024/2025\)](#) for specific species status.
- **Biodiversity Studies:** Recent [ResearchGate publications \(2025\)](#) on homestead biodiversity in Ashulia, Savar Sadar.
- **Government Reports:** Bangladesh Forest Department (BFD) and the Department of Environment (DoE).
- The Bangladesh Forest Department has been collaborating with the Bangladesh National Herbarium, National Botanical Garden and IUCN Bangladesh on this work.
- Citation: Raven, P., & Wackernagel, M. (2020). Maintaining biodiversity will define our long-term success. *Plant Diversity*, 42(4), 211-220. doi:10.1016/j.pld.2020.06.002

### 4.23.2 Fauna

In 2025, the faunal baseline for **Ashulia, Savar Sadar** (22°39'05.0"N 92°09'56.1"E) is defined by its position within the biologically diverse Chittagong Hill Tracts (CHT) and its proximity to the expansive Ashulia Water body ecosystem.

#### 1. Faunal Inventory

The region supports a high diversity of vertebrates, with species richness typically peaking during the winter months.

- **Mammals:** Common species include the Rhesus Macaque (*Macaca mulatta*), Barking Deer (*Muntiacus muntjak*), Wild Boar (*Sus scrofa*), and Small Indian Civet. Endangered species like the **Asian Elephant** and **Western Hoolock Gibbon** inhabit the deeper hilly tracts nearby.
- **Avifauna (Birds):** Over 300 bird species are recorded in the CHT region. Dominant resident species include the Common Myna, Black Drongo, and various woodpeckers. Ashulia Water body is a critical habitat for waterfowl such as the Grey-headed Fish Eagle.
- **Reptiles & Insects:** The area is rich in snakes (e.g., Burmese Python), lizards, and freshwater turtles. Insect diversity is vast, with ongoing efforts in 2025 to update red lists for butterflies and beetles.

#### 2. Migratory Patterns and Breeding Grounds

- **Migratory Birds:** Ashulia, Savar serves as a vital stopover for trans-Himalayan migratory birds during winter (November–February). Species like the Lesser Whistling Duck and various sandpipers frequent the water body's banks.
- **Carp Breeding Grounds:** In May 2025, scientists from the **Bangladesh Fisheries Research Institute (BFRI)** discovered a significant new **carp breeding ground** in Ashulia Water body (near Maladwip Point). Spawning success rates at this site were recorded at **90–95%**, though sedimentation remains a threat to its depth.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 3. Habitat Connectivity and Fragmentation

- **Fragmentation Status:** Urban expansion and land-use changes in Ashulia, Savar Sadar have led to **fragmented patches** of forest. This limits wildlife mobility and increases human-wildlife conflict, particularly involving elephants.
- **Conservation Connectivity:** As of late 2025, major transboundary projects (such as the **Chittagong–Lushai Big Cat Project**) are focused on restoring ecological corridors between Bangladesh and India to facilitate the movement of large mammals like tigers and leopards across these fragmented landscapes.

## 4. Conservation Significance (IUCN Red List 2025)

Updated assessments highlight several local species at risk:

- **Critically Endangered:** Chinese Pangolin, Asian Elephant (regional populations), and Western Hoolock Gibbon.
- **Vulnerable/Near Threatened:** Indian Roofed Turtle and Grey-headed Fish Eagle.

14 sites

- Impact of Habitat Fragmentation on the Diversity of Flora and Fauna ...

Md Mizanur Rahman ... It is revealed that both population size and species richness decrease with increasing habitat fragmentation...

SSRN eLibrary

- Wildlife - Banglapedia

Wildlife \* Asian elephant. \* Deer (Sambar) \* Wild cow. \* Mainland serow. \* Bear (Binturong) \* Civet. \* Mongoose. \* Common otter. \*

Banglapedia



- 2408-8455 EXPLORING WILDLIFE DIVERSITY AT NOAKHALI

Species Composition and Abundance: Over the study period, a total of 131 wildlife species were observed at the Noakhali Science an...

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

The big deer sambar and the small barking deer (*Muntiacus mungjak*) are found in the forests of Takshur, Mirzanagar, Ashulia, Savar, Dhaka. Elephants (*Elephas maximus*) are also seen in these forests. Jungle cat (*Felis chaus*) and fishing cat (*Felis viverrina*) are common; the beautiful clouded leopard (*Panthera Pardus*) and cats are also found. Wild boar (*Sus Scrofa*), wild dog, jackals (*Canis aureus*), fox (*Vulpes bengalensis*), weasels, honey badger (*Arctonyx collaris*), hog badger, and scaly anteaters are also found. Rodents are represented by different species of squirrel (*Funambulus pennanti*), rat (*Rattus rattus*).

Sl No	Species	Local Name	Status	Sl No	Species	Local Name	Status
1	Reptiles	Anjila	Common	16	Birds	Choroi	Common
2		DhuraShap	Common	17		Doyel	Common
3		MatiaShap	Common	18		Kak	Common
4		Tiktiki	Common	19		Bagari	Common
5		Kari Katta	Common	20		Ghughu	Common
6		DaraishShap	Common	21		Shalik	Common
7		Gokhra	F.Common	22		Kokil	Common
8		Kassap	F. Common	23		Bok	Common
9		GuiShap	Rare	24		Tuntuni	Common
10	Mammals	Babur	Common	25		Badur	Common
11		Idur	Common	26		Chil	Common
12		Shial	Common	27		Machranga	F.Common
13		Chika	Common	28		Tota	F.Common
14		Bagdash	Common	29		Haludakhi	F.Common
15		Khekshial .	F. Common	30		Katthokra	F.Common
Source: Field survey database; F=Fairly				31		Pecha	Rare
				32		Shakun	Rare
				33		Tia	Rare

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## CHAPTER 5 POTENTIAL ENVIRONMENTAL IMPACTS AND MITIGATION MEASURES

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### 5.1 General

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This study has identified anticipated environmental impacts associated with the unit's proposed project activity. Various activities during the project's construction and operation phases that are likely to affect multiple ecological components have been listed.

The baseline data for the environmental parameters presented in Chapter 4 of this report have been used to evaluate the impacts of the unit's proposed activities. Changes in environmental parameters and their impact, whether short-term or long-term, positive or negative, are identified and predicted. The reversible nature of these impacts is described in this chapter.

An assessment task is performed for both the construction and operation stages to identify, predict, and quantify the proposed project's impacts. All possible care is taken to assess temporary, short-term, long-term, direct, indirect, reversible, and irreversible consequences. It is also important to remember that the effects of activities during the construction phase will be temporary and limited to the project's construction period. In this chapter, the impact of the proposed project's construction and operational activities is explained. Finally, the description in tabular form, commonly known as the "Impact matrix," is illustrated.

During this assessment, it is revealed that implementing proper Management measures for all significant predicted impacts can eliminate or minimize damage to a negligible extent.

### 5.2 Environmental Sensitivity Investigation

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Environmental Sensitivity Investigation is an important component of the Environmental Impact Assessment (EIA) process, undertaken to identify environmental receptors, baseline environmental vulnerabilities, surrounding environmental conditions, and the capacity of the project area to withstand or accommodate project-induced changes.

For the proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project**, environmental sensitivity assessment has been conducted considering:

- Project location and surrounding land use pattern
- Existing industrial environment
- Surface water and drainage condition
- Air environment
- Ecological condition
- Geological and seismic condition
- Socio-economic environment
- Existing compatible industrial activities within the project boundary

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Potential cumulative environmental interactions

The project site is located at **Takshur, Mirzanagar, Ashulia, Savar, Dhaka**, within an established industrial region of the **Ashulia–Savar industrial corridor**.

A critical consideration in this investigation is that an **existing tannery waste processing facility (gelatin manufacturing plant)** already operates within the same industrial boundary, approximately **200 feet from the proposed project location**. The existing facility converts **tannery waste into gelatin for pharmaceutical capsule shell manufacturing** and previously completed an approved **Environmental Impact Assessment (EIA)** under the Department of Environment (DoE).

Therefore, the proposed project is assessed within a **brownfield-compatible industrial setting**, rather than a completely undeveloped greenfield environment.

## 5.2.1 Physical Environmental Sensitivity

### A. Land Use Sensitivity

The surrounding area within the project influence zone is predominantly characterized by:

- Industrial establishments
- Manufacturing activities
- Warehousing and utility infrastructure
- Internal industrial road systems
- Limited scattered settlements
- Drainage corridors and khal systems

The proposed location is environmentally compatible with industrial development due to:

- Existing industrial zoning characteristics.
- Presence of operational industries.
- Availability of supporting infrastructure.
- Existing industrial utility networks.

No major environmentally sensitive land uses such as:

- National parks
- Protected forests
- Wildlife sanctuaries
- Agricultural reserve land
- Ecologically critical areas

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

have been identified immediately adjacent to the proposed site.

Accordingly, land-use sensitivity of the project area is considered **moderate to low**.

## B. Surface Water Sensitivity

Water resources are among the most important environmental receptors for this project.

A nearby **Government Khal** exists in the surrounding environment and functions as:

- Stormwater receiving body
- Local drainage conveyance system
- Surface runoff outlet

Potential water sensitivity factors include:

- Industrial wastewater generation.
- Stormwater runoff.
- Chemical handling.
- Sludge and solid waste management.

Because wastewater generated from tannery waste processing may contain:

- Organic load
- Suspended solids
- Variable pH
- Trace chromium and chemical residues

surface water bodies remain environmentally sensitive receptors.

However, environmental sensitivity is reduced through the proposed incorporation of:

- **150 m<sup>3</sup>/day ETP**
- **Dedicated STP**
- **ZLD-oriented reuse system**
- Separate drainage system
- Controlled wastewater handling

Thus, surface water sensitivity is assessed as **moderate to high**, requiring strong environmental management.

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## C. Groundwater Sensitivity

Groundwater represents an important resource within the project area and is commonly used through:

- Deep tube-well systems
- Industrial abstraction
- Domestic usage

Potential groundwater sensitivity arises from:

- Wastewater leakage.
- Chemical spills.
- Sludge handling.
- Storage tank leakage.

The project therefore recognizes groundwater as a **sensitive environmental component**.

However, protection measures including:

- Impervious flooring
- Chemical containment
- Leak-proof pipelines
- Wastewater treatment systems

will reduce contamination risk.

Groundwater sensitivity is therefore classified as **moderate**.

## D. Air Quality Sensitivity

The project area already experiences characteristics of an industrial atmospheric environment.

Existing air emission sources include:

- Nearby industries
- Generator emissions
- Roadside dust
- Vehicular movement

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Utility operations

The proposed project may additionally generate:

- Spray drying dust
- Combustion emissions
- Odor from raw material handling

Sensitive air receptors include:

- Industrial workers
- Nearby industrial facilities
- Local settlements located in the broader surrounding area

Because the site already exists within an industrial zone, overall air sensitivity is considered **moderate**.

## 5.2.2 Ecological Environmental Sensitivity

Ecological sensitivity assessment evaluates the presence of environmentally important habitats, biodiversity resources, vegetation, and ecological receptors.

The project area is predominantly industrialized and exhibits:

- Limited roadside vegetation
- Scattered shrubs and trees
- Modified industrial landscape
- Low habitat diversity

No identified presence of:

- Protected forest
- Wildlife sanctuary
- Migratory habitat
- Ecological critical area (ECA)
- Wetland reserve

exists immediately adjacent to the proposed project.

Consequently, ecological sensitivity within the project influence zone is considered **low to moderate**.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 5.2.3 Natural Hazard and Geological Sensitivity

Environmental sensitivity also considers natural hazards and geological vulnerability.

### Flood and Drainage Sensitivity

The broader Ashulia–Savar region experiences:

- Monsoonal rainfall
- Seasonal drainage pressure
- Localized waterlogging potential

Nearby drainage channels and the Government Khal contribute to stormwater management.

Therefore, moderate sensitivity exists regarding:

- Surface runoff control.
- Drainage blockage.
- Flood resilience.

### Seismic Sensitivity

According to national seismic zoning, the project area falls within a **moderate seismic sensitivity region**.

Potential sensitivity considerations include:

- Structural integrity.
- Equipment safety.
- Utility system stability.

All infrastructure will therefore be designed in accordance with:

- **BNBC requirements**
- Engineering safety standards

### Landslide Sensitivity

The project area is located on generally **flat topography** typical of central Bangladesh.

No:

- Hills
- Steep slopes

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Major elevation gradients
- Landslide-prone geomorphology

have been identified.

Therefore, landslide sensitivity is considered **negligible**.

### 5.2.4 Socio-economic Sensitivity

The surrounding environment contains:

- Industrial labor communities
- Service establishments
- Transportation activities
- Small businesses
- Industrial support sectors

Socio-economic sensitivity relates to:

- Employment conditions.
- Occupational health.
- Community infrastructure.
- Traffic movement.
- Worker safety.

Because the local economy is already industrially oriented, the proposed project is expected to remain compatible with surrounding socio-economic activities.

The project may generate:

- Additional employment.
- Local economic stimulation.
- Industrial service demand.

Accordingly, socio-economic sensitivity is assessed as **moderate**, with substantial opportunity for positive impact.

### 5.2.5 Cumulative Environmental Sensitivity

A special environmental sensitivity consideration applies due to the presence of the **existing gelatin manufacturing facility within the same industrial boundary**.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

The existing facility:

- Utilizes tannery waste feedstock.
- Operates under prior **DoE-approved environmental clearance**.
- Functions approximately **200 feet from the proposed project**.

Consequently, cumulative environmental sensitivity must consider:

- Combined wastewater generation.
- Combined air emission load.
- Shared transportation demand.
- Industrial noise contribution.
- Utility demand.

However, environmental compatibility is supported because:

- Similar raw material handling already exists.
- Environmental precedent has been established.
- Industrial land use compatibility is confirmed.

The cumulative sensitivity is therefore assessed as **moderate and manageable under coordinated environmental management practices**.

Table 5-1 Environmental Sensitivity Assessment Summary Table

Environmental Component	Sensitivity Level	Key Sensitivity Factors
Land Use	Low–Moderate	Existing industrial environment
Surface Water	Moderate–High	Government Khal, wastewater potential
Groundwater	Moderate	Deep tube-well dependence
Air Environment	Moderate	Existing industrial air condition
Ecology	Low–Moderate	Limited vegetation, modified landscape
Seismicity	Moderate	Regional seismic condition
Landslide	Negligible	Flat terrain
Socio-economic	Moderate	Industrial workforce and infrastructure
Cumulative Environment	Moderate	Existing adjacent gelatin facility

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

The environmental sensitivity investigation indicates that the proposed **Industrial Protein Powder from Tannery Waste Project** is located within a **pre-established industrial setting** possessing moderate environmental sensitivity, particularly with respect to **surface water, groundwater, air quality, and cumulative industrial interactions**.

The presence of an existing **DoE-approved gelatin manufacturing facility within the same boundary** demonstrates prior environmental compatibility of tannery waste-based industrial activities at the location.

With implementation of:

- **150 m<sup>3</sup>/day ETP**
- STP
- ZLD-oriented reuse system
- Pollution control infrastructure
- Environmental monitoring program
- Occupational and environmental safeguards

the identified environmental sensitivities are expected to remain **manageable and environmentally acceptable** under project operational conditions.

## 5.2.6 Seismicity

Bangladesh is located in a tectonically active region influenced by the **Indian, Eurasian, and Burmese plates**. According to national seismic zoning:

- The project site falls under **Seismic Zone II (Moderate Risk Zone)**.

### Seismic Characteristics:

- Probability of **moderate earthquakes** exists
- Historical records indicate **low to moderate seismic activity** in central Bangladesh

### Sensitivity Assessment:

- **Buildings and Structures:** High sensitivity if not designed properly
- **Machinery and Equipment:** Moderate sensitivity
- **Human Safety:** Moderate sensitivity

### Mitigation Consideration:

- All structures must comply with the **Bangladesh National Building Code (BNBC)**
- Use of **earthquake-resistant design** and materials

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

👉 **Conclusion:** Seismic risk is **moderate**, and with proper engineering design, the potential impacts can be effectively minimized.

The following figure shows the vulnerability map of different hazards in Bangladesh. From the figure, it is understood that the study area falls in the storm surge-affected area. Cyclones generally cause storm surges. So, any infrastructure development in this area should be accompanied by measures to mitigate this event. It would help the decision-maker to make decisions during the design period.



Figure 5-1 Hazard Map of Bangladesh

## 5.3 Identification of Potential Impacts

The identification of potential impacts involves a systematic evaluation of **project activities** and their interactions with environmental components. This includes both **adverse and beneficial impacts**, assessed through matrices and qualitative analysis.

### Environmental Sensitivity Matrix – Natural Hazards

Environmental Component	Sensitivity Level	Potential Impact	Significance

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Land	Medium	Flooding, erosion	Moderate
Surface Water	High	Contamination from runoff	High
Groundwater	Medium	Pollution infiltration	Moderate
Infrastructure	Medium	Waterlogging damage	Moderate
Human Health	Medium	Waterborne diseases	Moderate

👉 **Interpretation:** Surface water is the **most sensitive receptor**, requiring strong drainage and wastewater control measures.

### Environmental Sensitivity Matrix – Seismicity

Component	Sensitivity Level	Impact Type	Significance
Buildings	High	Structural damage	High
Equipment	Medium	Operational disruption	Moderate
Workers	Medium	Injury risk	Moderate
Utilities	Medium	Service interruption	Moderate

👉 **Interpretation:** Structural safety is the **primary concern**, highlighting the importance of seismic design compliance.

### Environmental Sensitivity Matrix – Landslide

Component	Sensitivity Level	Impact Type	Significance
Land	Low	No slope instability	Negligible
Infrastructure	Low	No impact	Negligible
Human Safety	Low	No risk	Negligible

👉 **Interpretation:** Due to flat terrain, **landslide risk is insignificant** and does not influence project feasibility.

### Environmental Sensitivity Matrix – Overall Environmental Sensitivity

Environmental Attribute	Sensitivity Level	Remarks
Air Quality	Medium	Existing industrial emissions present
Surface Water	High	Vulnerable to pollution
Groundwater	Medium	Risk of contamination

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Soil	Medium	Risk from waste disposal
Ecology	Low	Limited biodiversity in industrial zone
Socio-economic	High	High dependence on industrial growth

### 👉 Interpretation:

- The water environment is highly sensitive
- Socio-economic environment is highly beneficial and sensitive

### Identification of Potential Impacts Matrix (Summary)

Project Activity	Air Impact	Water Impact	Soil Impact	Noise Impact	Socio-economic Impact
Site Preparation	Moderate (-)	Low (-)	Moderate (-)	High (-)	Positive (+)
Construction	Moderate (-)	Low (-)	Moderate (-)	High (-)	Positive (+)
Raw Material Handling	Moderate (-)	Moderate (-)	Moderate (-)	Low (-)	Positive (+)
Processing Operations	Moderate (-)	High (-)	Moderate (-)	Moderate (-)	High Positive (+)
Waste Management	Low (-)	High (-)	Moderate (-)	Low (-)	Positive (+)
Employment & Economy	—	—	—	—	High Positive (+)

### 👉 Legend:

- (-) = Negative Impact
- (+) = Positive Impact

### Overall Interpretation:

- **Major Negative Impact:** Water environment (due to the process wastewater)
- **Moderate Impacts:** Air, soil, and noise
- **Major Positive Impact:** Socio-economic development

The environmental sensitivity investigation indicates that the project area has **moderate vulnerability to natural hazards and seismic risks**, while **landslide risk is negligible**. The sensitivity matrices highlight that **water resources are the most critical environmental component**, requiring stringent management

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Powder from Tannery Waste)

## REFERENCE LIST

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The evaluation of environmental impacts due to the installation of **Yongli Biotechnology Co. Ltd. (Industrial Protein Powder from Tannery Waste)**, considering the baseline status within a radius of 3 km around the proposed plant, and the mitigation measures are as follows:

## 5.4 Identification of Impacting Activities

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- I. Various activities involved in the proposed project are:
  - A. Construction phase activities
  - B. Operation phase activities
- II. The activities identified for the proposed project under each phase are:
  - A. Construction phase:**
    1. Excavation
    2. Foundation & Civil work
    3. Transportation of construction materials, equipment, & machineries
    4. Construction of the project.
  - B. Operation phase:**
    1. Handling and Transfer of Solid Waste
    2. Movement of the Vehicle
    3. Operation of Project
    4. Sewage Water Management

## 5.5 Likely Beneficial Impacts

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The proposed Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project is expected to generate a range of positive environmental, economic, and social impacts. These beneficial impacts will occur during both the construction phase and the operational phase, contributing to sustainable industrial development and improved environmental management in the project area.

The project is particularly significant due to its waste-to-resource conversion approach, which aligns with modern principles of circular economy and pollution reduction:

### Construction Phase

During the construction phase, although temporary environmental disturbances may occur, several **short-term beneficial impacts** are anticipated:

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## a) Employment Generation

- Creation of **temporary job opportunities** for local laborers, technicians, and construction workers
- Engagement of local contractors, suppliers, and service providers
- Improvement in **household income levels** in the surrounding community

## b) Development of Local Infrastructure

- Improvement of **access roads, transportation facilities, and utility connections**
- Enhancement of **site drainage systems**, which may also benefit adjacent areas
- Development of basic infrastructure such as electricity and water supply networks

## c) Economic Stimulation

- Increased demand for **construction materials (sand, cement, steel, etc.)**
- Growth of **local businesses** such as food vendors, transport services, and small shops
- Circulation of money within the local economy

## d) Skill Development and Capacity Building

- Opportunities for local workers to gain **technical skills in construction and industrial setup**
- Exposure to **modern construction practices and safety standards**

## e) Land Utilization

- Productive use of **underutilized or vacant industrial land**
- Transformation of the site into a **planned and structured industrial facility**

## Operation Phase

The operational phase will generate **long-term and sustainable benefits**, which are significantly more impactful than those of the construction phase.

### a) Waste-to-Resource Conversion (Major Environmental Benefit)

- Utilization of **leather cutting waste** from nearby tanneries
- Reduction of **solid waste accumulation and improper disposal**
- Contribution to **pollution reduction in the leather sector**
- Promotion of **circular economy practices**

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

## **b) Reduction of Environmental Pollution Load**

- Decrease in **uncontrolled dumping of tannery waste**
- Lower risk of **soil and water contamination**
- Improvement in **local environmental quality**

## **c) Industrial Growth and Economic Development**

- Generation of **permanent employment opportunities** (skilled, semi-skilled, and unskilled)
- Contribution to **national industrial output and GDP**
- Potential for **export earnings** from industrial protein powder

## **d) Value Addition to Industrial By-products**

- Conversion of low-value waste into **high-value industrial protein powder**
- Increased **resource efficiency** in the leather industry
- Support for downstream industries such as **animal feed, fertilizers, and chemicals**

## **e) Technology Transfer and Innovation**

- Introduction of **modern processing technologies** such as hydrolysis, dechromisation, and spray drying
- Adoption of **advanced environmental management systems**, including ETP and ZLD
- Encouragement of future investments in **green and sustainable technologies**

## **f) Improvement of Local Socio-economic Conditions**

- Increased **income levels and livelihood opportunities**
- Development of **supporting services (transport, maintenance, supply chain)**
- Strengthening of **industrial base in Ashulia–Savar region**

## **g) Efficient Water and Waste Management**

- Implementation of **150 m<sup>3</sup>/day ETP** ensuring proper wastewater treatment
- Adoption of **Zero Liquid Discharge (ZLD)** approach, minimizing environmental impact
- Promotion of **water reuse and conservation practices**

## **h) Government Revenue and Compliance**

- Contribution to government through **taxes, duties, and fees**

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Compliance with **environmental regulations**, enhancing responsible industrial practices

The proposed project will generate **significant beneficial impacts**, particularly during the **operational phase**, where long-term environmental and socio-economic advantages are most prominent.

The project stands out due to its role in:

- **Reducing tannery waste pollution**
- **Promoting sustainable industrial development**
- **Enhancing economic growth and employment**

Overall, the project represents a **positive and forward-looking industrial initiative**, aligning with national priorities for **environmental sustainability, resource efficiency, and economic development**.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 5.6 CONSTRUCTION AND OPERATIONAL PHASE IMPACTS AND MITIGATION MEASURES (YONGLI BIOTECHNOLOGY CO. LTD., INDUSTRIAL PROTEIN POWDER FROM TANNERY WASTE PROJECT)

### 5.6.1 Construction Phase Impact and Mitigation Measures

#### A. Physical Environment

Impact Source	Potential Environmental Impact	Mitigation Measures
<b>Land Development and Site Preparation</b>	<ul style="list-style-type: none"> <li>• Temporary loss of topsoil and change in land morphology</li> <li>• Risk of soil erosion due to earthworks and leveling</li> </ul>	<ul style="list-style-type: none"> <li>• Strip and store topsoil separately for reuse in landscaping</li> <li>• Proper compaction and grading of land</li> <li>• Provide temporary drainage to prevent erosion</li> <li>• Construct boundary wall and internal drainage system</li> </ul>
<b>Excavation and Construction Activities</b>	<ul style="list-style-type: none"> <li>• Dust generation affecting air quality</li> <li>• Worker discomfort and reduced visibility</li> </ul>	<ul style="list-style-type: none"> <li>• Regular water spraying on exposed areas and roads</li> <li>• Cover trucks transporting soil/sand</li> <li>• Use temporary dust barriers/screens</li> </ul>
<b>Construction Material Handling</b>	<ul style="list-style-type: none"> <li>• Spillage of cement, sand, and aggregates</li> <li>• Soil contamination</li> </ul>	<ul style="list-style-type: none"> <li>• Store materials in designated covered areas</li> <li>• Use impervious platforms for cement storage</li> </ul>
<b>Construction Waste Generation</b>	<ul style="list-style-type: none"> <li>• Generation of debris, scrap metal, packaging waste</li> <li>• Land pollution if unmanaged</li> </ul>	<ul style="list-style-type: none"> <li>• Segregate recyclable and non-recyclable waste</li> <li>• Reuse excavated soil for filling and leveling</li> <li>• Dispose waste through approved vendors</li> </ul>
<b>Noise and Vibration</b>	<ul style="list-style-type: none"> <li>• Noise from machinery and vehicles</li> <li>• Disturbance to nearby industries and workers</li> </ul>	<ul style="list-style-type: none"> <li>• Restrict noisy work to daytime</li> <li>• Maintain equipment regularly</li> <li>• Provide ear protection (PPE)</li> </ul>

**Environmental Impact Assessment (EIA) of  
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<b>Surface Runoff Pollution</b>	<ul style="list-style-type: none"> <li>• Runoff carrying soil, oil, grease into drains</li> </ul>	<ul style="list-style-type: none"> <li>• Construct temporary drainage and sediment traps</li> <li>• Avoid discharge of untreated runoff</li> <li>• Store fuel in leak-proof areas</li> </ul>
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**B. Biological Environment**

<b>Impact Source</b>	<b>Potential Impact</b>	<b>Mitigation Measures</b>
<b>Vegetation Clearing</b>	<ul style="list-style-type: none"> <li>• Removal of limited vegetation</li> <li>• Loss of green cover</li> </ul>	<ul style="list-style-type: none"> <li>• Minimize clearing</li> <li>• Implement plantation program (1:3 ratio)</li> </ul>
<b>Disturbance to Local Fauna</b>	<ul style="list-style-type: none"> <li>• Temporary disturbance due to noise and movement</li> </ul>	<ul style="list-style-type: none"> <li>• Limit unnecessary night work</li> <li>• Develop greenbelt after construction</li> </ul>

**C. Socio-economic Environment**

<b>Impact Source</b>	<b>Potential Impact</b>	<b>Mitigation Measures</b>
<b>Employment Generation</b>	<ul style="list-style-type: none"> <li>• Positive impact through local job creation</li> </ul>	<ul style="list-style-type: none"> <li>• Prioritize local labor recruitment</li> </ul>
<b>Traffic Movement</b>	<ul style="list-style-type: none"> <li>• Increased transport of materials may cause congestion</li> </ul>	<ul style="list-style-type: none"> <li>• Implement traffic management plan</li> <li>• Schedule material delivery during off-peak hours</li> </ul>
<b>Occupational Health &amp; Safety</b>	<ul style="list-style-type: none"> <li>• Risk of injury, dust exposure, accidents</li> </ul>	<ul style="list-style-type: none"> <li>• Provide PPE (helmet, mask, gloves)</li> <li>• Safety training and first aid facilities</li> </ul>

**6.6.2 Operational Phase Impact and Mitigation Measures**

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## A. Physical Environment

Impact Source	Potential Environmental Impact	Mitigation Measures
<b>Process Wastewater Generation (Washing, Hydrolysis, Dechromisation)</b>	<ul style="list-style-type: none"> <li>High BOD, COD, TSS and possible chromium contamination</li> <li>Risk of surface and groundwater pollution</li> </ul>	<ul style="list-style-type: none"> <li>Operate <b>150 m<sup>3</sup>/day ETP</b> efficiently</li> <li>Maintain wastewater load within design capacity (<math>\leq 135 \text{ m}^3/\text{day}</math>)</li> <li>Implement <b>ZLD system (RO + MEE)</b> for reuse</li> <li>Regular monitoring as per DoE standards</li> </ul>
<b>Air Emissions (Spray Drying &amp; Boiler)</b>	<ul style="list-style-type: none"> <li>Dust/particulate emission from spray dryer</li> <li>Flue gas from boiler</li> </ul>	<ul style="list-style-type: none"> <li>Install <b>bag filter/cyclone separator</b></li> <li>Maintain adequate stack height</li> <li>Use clean fuel and periodic emission monitoring</li> </ul>
<b>Odor Generation</b>	<ul style="list-style-type: none"> <li>Odor from raw leather waste and processing</li> </ul>	<ul style="list-style-type: none"> <li>Use covered storage for raw materials</li> <li>Ensure quick processing</li> <li>Maintain good housekeeping</li> </ul>
<b>Noise Pollution</b>	<ul style="list-style-type: none"> <li>Noise from shredder, pumps, blower, dryer</li> </ul>	<ul style="list-style-type: none"> <li>Install acoustic enclosure</li> <li>Regular maintenance</li> <li>Provide PPE (ear protection)</li> </ul>
<b>Energy Consumption</b>	<ul style="list-style-type: none"> <li>High electricity use increases carbon footprint</li> </ul>	<ul style="list-style-type: none"> <li>Use energy-efficient machinery</li> <li>Consider solar system for auxiliary load</li> </ul>

## B. Waste Management and Pollution Control

Impact Source	Potential Impact	Mitigation Measures
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**Environmental Impact Assessment (EIA) of  
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<b>ETP Sludge</b>	<ul style="list-style-type: none"> <li>• Contains organic matter and possible heavy metals</li> </ul>	<ul style="list-style-type: none"> <li>• Dewater using sludge drying bed/filter press</li> <li>• Dispose to approved hazardous landfill</li> </ul>
<b>Solid Waste (Leather Residue, Filter Cake)</b>	<ul style="list-style-type: none"> <li>• Improper disposal may contaminate soil</li> </ul>	<ul style="list-style-type: none"> <li>• Segregate and reuse where possible</li> <li>• Dispose through authorized facility</li> </ul>
<b>Chemical Waste (Dechromisation Chemicals)</b>	<ul style="list-style-type: none"> <li>• Risk of toxicity and environmental contamination</li> </ul>	<ul style="list-style-type: none"> <li>• Proper storage with labeling</li> <li>• Use controlled dosing</li> <li>• Dispose via licensed handlers</li> </ul>
<b>ZLD Residual Salts</b>	<ul style="list-style-type: none"> <li>• Solid salt accumulation from evaporation</li> </ul>	<ul style="list-style-type: none"> <li>• Safe disposal in approved landfill</li> <li>• Periodic testing for heavy metals</li> </ul>

**C. Occupational Health and Public Safety**

<b>Impact Source</b>	<b>Potential Impact</b>	<b>Mitigation Measures</b>
<b>Chemical Exposure</b>	<ul style="list-style-type: none"> <li>• Workers exposed to hydrolysis and dechromisation chemicals</li> </ul>	<ul style="list-style-type: none"> <li>• Provide PPE (gloves, mask, goggles)</li> <li>• Safety training and MSDS compliance</li> </ul>
<b>Dust Exposure (Protein Powder)</b>	<ul style="list-style-type: none"> <li>• Respiratory issues for workers</li> </ul>	<ul style="list-style-type: none"> <li>• Install dust collection system</li> <li>• Use masks and enclosed system</li> </ul>
<b>Heat Exposure</b>	<ul style="list-style-type: none"> <li>• High temperature near dryer and evaporator</li> </ul>	<ul style="list-style-type: none"> <li>• Provide ventilation and cooling ব্যবস্থা</li> <li>• Work rotation system</li> </ul>
<b>Fire and Explosion Risk</b>	<ul style="list-style-type: none"> <li>• Due to boiler, electrical system</li> </ul>	<ul style="list-style-type: none"> <li>• Install fire protection system</li> <li>• Emergency response plan</li> </ul>

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

<b>Emergency Situations</b>	<ul style="list-style-type: none"> <li>• Chemical spill, equipment failure</li> </ul>	<ul style="list-style-type: none"> <li>• Spill kits and trained team</li> <li>• Emergency drills and first aid system</li> </ul>
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The construction and operation of **Yongli Biotechnology Co. Ltd.** will have **manageable environmental impacts** if proper mitigation measures are implemented.

The most critical aspect is **wastewater management**, which is effectively controlled through:

- **150 m<sup>3</sup>/day ETP (sufficient capacity)**
- **ZLD system ensuring no liquid discharge**

With proper environmental management, the project will operate in a **safe, sustainable, and compliant manner**.

### 5.6.2 Beneficial Impact Identification and Evaluation Matrix

The beneficial impacts during the construction and operation phase are presented in the following table;

Table 5-2 Beneficial Impact Identification and Evaluation Matrix

S.N.	Issues	Impacts	Impact Rating				
			Nature	Magnitude	Extent	Duration	Rating
<b>Beneficial Impacts</b>							
<b>Construction Phase</b>							
1	Employment Opportunity	Employment generation and local employment	D	H	SS	ST	Significant
2	Skill Enhancement	Skill and knowledge development through training and orientation	D	M	Lo	LT	Significant

**Environmental Impact Assessment (EIA) of  
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Waste)**

3	Increase in Economic Activities	Increase in economic activities due to supply of goods and services	D	M	SS	LT	Significant
<b>Operation Phase</b>							
1	Employment Generation and Promotion	Increases in the economic status of the employer Growth of the local economy	D	H	Lo	LT	Significant
2	Income and revenue generation	Income and revenue generation for both proponents and the local people	D	M	Lo	LT	Significant
3	Promotion of local business	Establishment of small-scale businesses leading to the growth of the economic condition of the local	D/ID	M	Lo	LT	Significant
4	Cultural Exchange	Cultural exchange between locals and tourists	D	M	Lo	LT	Significant
5	Corporate Social Responsibility activities	Enhancement in the skill of local and promotion in the small-scale business	D	M	SS	LT	Significant

**Notes:** D= Direct; ID= Indirect; H= High; M=Medium; SS= Small scale; Lo= Local; R= Regional; ST= Short Term; LT= Long Term

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 5.7 Community Recommendations

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The following recommendations were made during public consultation -

- As positive externalities, the proposed project should improve and create a livelihood for the local people.
- The contractor should employ local people during construction work;
- Adequate safety measures should be taken during construction work.
- Concerns were also raised about possible traffic and population pressure caused by externally employed personnel;
- Finally, local people have appreciated the Project and its employment generation and have promised to cooperate with the executing agency during project implementation.

## 5.8 Identification of Environmental Attributes

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Before an environmental impact assessment, it is necessary to focus on ecological parameters. The primary concern in selecting environmental parameters is the identification, prediction, and quantification of impacts. These parameters may be independent or interrelated, and may also be related to the proposed project. The selected parameters for the Environmental Impact Assessment are illustrated below.

### 5.8.1 Ecological Parameters

Floral Communities, Faunal Communities, Aquatic Ecosystems, and Marine Ecosystems.

### 5.8.2 Physico-Chemical Parameters

Water quality, Air quality, Soil quality, and Land use.

### 5.8.3 Socio-Economic Environment

Aesthetic Conditions, Local Housing Structures, Public Services, Health & Safety, Socio-economic activities, Employment.

## 5.9 Identification of Potential Physical Environmental Impact

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### A. Construction Phase

During the construction phase, impacts are generally **short-term, localized, and reversible**, primarily associated with land development and civil works.

#### 1. Impact on Land Environment

- Site clearing, excavation, and earth filling may lead to **temporary alteration of land morphology**.
- Removal of topsoil can reduce soil fertility in localized areas.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Improper handling of construction materials may cause **soil contamination**.

## Assessment:

- Magnitude: Low to Moderate
- Duration: Short-term
- Reversibility: High

## 2. Impact on Air Quality

- Dust generation (PM10, PM2.5) from excavation, vehicle movement, and material handling.
- Emissions from construction equipment and transport vehicles.

## Potential Effects:

- Temporary deterioration of ambient air quality
- Respiratory discomfort for workers

## Assessment:

- Magnitude: Moderate
- Duration: Short-term
- Reversibility: High

## 3. Impact on Water Environment

- Surface runoff carrying **sediments, cement slurry, oil, and grease** may contaminate nearby drains.
- Improper waste disposal may affect **surface water quality**.

## Assessment:

- Magnitude: Low to Moderate
- Duration: Short-term
- Reversibility: High

## 4. Impact on Noise Environment

- Noise generated from construction machinery, generators, and transport vehicles.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## Potential Effects:

- Temporary disturbance to workers and nearby industrial units

## Assessment:

- Magnitude: Moderate
- Duration: Short-term
- Reversibility: High

## 5. Impact on Drainage and Hydrology

- Temporary blockage of natural drainage due to construction activities.
- Risk of localized **waterlogging during rainfall**.

## Assessment:

- Magnitude: Low
- Duration: Temporary
- Reversibility: High

## B. Operation Phase

During the operational phase, impacts are **long-term and continuous**, requiring proper environmental management systems.

### 1. Impact on Water Environment (Most Significant Impact)

- Wastewater generated from **washing, hydrolysis, filtration, and dechromisation processes** contains:
  - High **BOD, COD, TSS**
  - Trace **chromium and chemicals**

## Potential Effects:

- Pollution of surface water bodies
- Risk of groundwater contamination

## Mitigation Context:

- Wastewater will be treated in a **150 m<sup>3</sup>/day ETP**
- **ZLD system** ensures reuse and no discharge

## Assessment:

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Magnitude: High (without control)
- With mitigation: Low
- Duration: Long-term
- Reversibility: Moderate

## 2. Impact on Air Quality

- Emissions from:
  - Spray drying unit (fine particulate matter)
  - Boiler and standby generator
- Odor from raw leather waste handling

### Potential Effects:

- Localized air quality degradation
- Odor nuisance

### Assessment:

- Magnitude: Moderate
- Duration: Continuous
- Reversibility: Moderate

## 3. Impact on Soil Environment

- Risk of soil contamination due to:
  - Improper disposal of sludge and solid waste
  - Leakage of chemicals or untreated wastewater

### Mitigation Context:

- Proper sludge handling and disposal
- Impervious flooring and drainage system

### Assessment:

- Magnitude: Moderate
- Duration: Long-term

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Reversibility: Moderate

## 4. Impact on Noise Environment

- Noise generated from:
  - Shredding machines
  - Pumps, blowers, and dryers

### Potential Effects:

- Continuous exposure affecting workers

### Assessment:

- Magnitude: Low to Moderate
- Duration: Long-term
- Reversibility: High

## 5. Impact on Drainage and Hydrology

- Improper wastewater handling may affect **local drainage system**
- Risk of overflow or leakage

### Mitigation Context:

- Proper internal drainage system
- Controlled wastewater flow to ETP

### Assessment:

- Magnitude: Moderate
- Duration: Long-term
- Reversibility: Moderate

## 6. Impact on Microclimate

- Heat generation from dryers and evaporators
- Minor localized increase in temperature

### Assessment:

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Magnitude: Low
- Duration: Continuous
- Reversibility: High

## Overall Evaluation

Environmental Component	Construction Phase Impact	Operation Phase Impact	Significance
Land	Low–Moderate	Moderate	Manageable
Air	Moderate	Moderate	Controlled
Water	Low–Moderate	High (critical)	Requires strict control
Soil	Low	Moderate	Controlled
Noise	Moderate	Low–Moderate	Manageable

The project's physical environmental impacts are moderate and manageable, with the water environment identified as the most sensitive component.

## 5.10 Impact on Socio-Economic and Cultural Environment

The proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project** is expected to have a range of **direct and indirect impacts on the socio-economic and cultural environment** of the surrounding area, particularly in **Takshur, Mirzanagar, Ashulia, Savar, Dhaka**.

This assessment evaluates both **positive (beneficial)** and **negative (adverse)** impacts during the **construction and operational phases**, considering aspects such as employment, income generation, public health, infrastructure, and community well-being.

### 5.10.1 Construction Phase

During the construction phase, impacts are generally **temporary and localized**, with both beneficial and minor adverse effects.

#### a) Employment Generation and Income Opportunities (Positive Impact)

- The construction phase will create **short-term employment opportunities** for local laborers, technicians, and support staff.
- Increased income generation will improve **local livelihoods and purchasing capacity**.

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Engagement of local suppliers and contractors will stimulate **small-scale economic activities**.

👉 **Impact Significance:** Moderate Positive

### b) Development of Local Economy (Positive Impact)

- Demand for construction materials, transportation, and services will **boost local businesses**.
- Increased economic transactions will enhance **circulation of money in the local market**.

👉 **Impact Significance:** Moderate Positive

### c) Pressure on Local Infrastructure (Adverse Impact)

- Increased movement of construction vehicles may lead to:
  - Temporary **traffic congestion**
  - Road deterioration
- Additional demand on **water and electricity supply**

👉 **Impact Significance:** Low to Moderate Negative

### d) Occupational Health and Safety Risks (Adverse Impact)

- Construction workers may face risks such as:
  - Accidents and injuries
  - Dust and noise exposure

👉 **Impact Significance:** Moderate Negative (manageable with safety measures)

### e) Community Disturbance (Adverse Impact)

- Noise and dust may cause **temporary inconvenience** to nearby residents and workers in adjacent industries.

👉 **Impact Significance:** Low Negative

## 5.10.2 Operation Phase

The operational phase will generate **long-term socio-economic benefits**, along with some manageable risks.

### a) Long-term Employment Generation (Major Positive Impact)

- The project will create **permanent employment opportunities** for skilled, semi-skilled, and unskilled workers.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Employment in areas such as:
  - Production and processing
  - Maintenance and operation
  - Administration and logistics

👉 **Impact Significance:** High Positive

## b) Industrial and Economic Development (Major Positive Impact)

- Strengthening of the **industrial base in Ashulia–Savar region**
- Contribution to **national GDP and industrial growth**
- Development of **supporting industries (transport, packaging, maintenance services)**

👉 **Impact Significance:** High Positive

## c) Waste Management Improvement (Environmental-Social Benefit)

- Utilization of tannery waste will reduce **uncontrolled dumping and pollution**
- Improved environmental quality will positively influence **public health and living conditions**

👉 **Impact Significance:** High Positive

## d) Skill Development and Technology Transfer (Positive Impact)

- Workers will gain exposure to **modern industrial technologies** such as hydrolysis, spray drying, and wastewater treatment (ETP and ZLD).
- Enhances **technical capacity and human resource development** in the region

👉 **Impact Significance:** Moderate to High Positive

## e) Public Health Considerations (Potential Adverse Impact)

- Risks associated with:
  - Odor from raw material handling
  - Air emissions (dust, flue gas)
  - Industrial noise

👉 **Impact Significance:** Moderate Negative (controllable through mitigation measures)

## f) Traffic and Transportation Impact (Adverse Impact)

- Increased movement of:

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Raw material transport vehicles
- Finished product delivery trucks

This may lead to:

- Traffic congestion
- Road safety concerns

👉 **Impact Significance:** Moderate Negative

## g) Occupational Health and Safety (Adverse Impact)

- Workers may be exposed to:
  - Chemicals used in hydrolysis and dechromisation
  - Heat and noise from machinery
  - Dust from protein powder

👉 **Impact Significance:** Moderate Negative (manageable with PPE and safety protocols)

## h) Cultural Environment Impact

- The project site is located in an **industrial zone**, with no identified cultural heritage or archaeological sites nearby.
- Therefore, **no direct impact on cultural or heritage resources** is expected.

However:

- Improved economic conditions may enhance **community lifestyle and social structure**

👉 **Impact Significance:** Neutral to Positive

## Overall Socio-Economic Impact Assessment

Impact Category	Nature of Impact	Significance
Employment	Positive	High
Local Economy	Positive	High
Infrastructure Pressure	Negative	Low–Moderate
Public Health	Mixed	Moderate
Traffic	Negative	Moderate
Skill Development	Positive	High

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Cultural Impact	Neutral/Positive	Low
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The proposed project will have **significant positive socio-economic impacts**, particularly in terms of **employment generation, industrial development, waste management improvement, and economic growth**

## 5.11 Chemical Environment

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### 5.11.1 Construction Phase

Impact due to chemicals for curing and protection of materials

The chemicals used during construction, such as concrete curing agents, protective and decorative coatings, floor hardeners, dust proofers, and waterproofing chemicals, can cause water, soil, and air pollution, leading to health problems and environmental hazards.

The envisaged direct impact is of high magnitude, local in extent, and long-term in duration, making it highly significant.

### 5.11.2 Operation Phase

Impact due to the use of chemicals.

Chemical runoff to the surrounding area and water sources will cause water and soil pollution. Additionally, soap, detergents, and chemicals used in bathrooms and toilets are often not handled with care, which can pollute the surrounding environment.

The envisaged indirect impact is of low magnitude, local in extent, and long-term in duration, yet significant.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 5.11.3 Adverse Impact Identification and Evaluation Matrix

Table 5-3 Adverse Impact Identification and Evaluation Matrix

S.N.	Issues	Impacts	Impact Rating				
			Nature	Magnitude	Extent	Duration	Rating
<b>A</b>							
<b>Adverse Impacts</b>							
<b>Physical Environment</b>							
<b>A6.8.1 Construction Phase</b>							
A6.8.1.1	Change in land use	Change in land use due to construction of project	D	L	SS	LT	Insignificant
A6.8.1.2	Impact due to spoil disposal	Water, soil and air pollution	D	L	SS	ST	Insignificant
A6.8.1.3	Impact due to air	Air pollution	D	M	Lo	ST	Significant
A6.8.1.4	Impact due to noise and vibration	Noise pollution	D	M	Lo	ST	Significant
A6.8.1.5	Issues concerned with Construction waste	Water, soil and air pollution	D	M	Lo	ST	Significant
A6.8.1.6	Impact on groundwater	Reduce the water table	D	L	SS	ST	Insignificant
A6.8.1.7	Impact due to waste generation	Reduction on drainage and waste disposal quality	ID	L	Lo	ST	Insignificant
A6.8.1.8	Impact due to water pollution	Water Pollution	D	L	Lo	ST	Insignificant
A6.8.1.9	Issues concerned with fire hazard	Accident, loss of lives and property	ID	M	SS	LT	Significant
A6.8.1.10	Energy alternatives	Sound pollution	D	L	SS	ST	Insignificant
A6.8.1.11	Soil stability and safety of neighboring properties	Sliding or failure of the ground	D	M	Lo	ST	Insignificant
A6.8.1.12	Effect of heavy equipment on the road surface	Damage on road surface	D	L	SS	ST	Insignificant
A6.8.1.13	Road congestion, traffic and parking issues	Congestion around the road, traffic and parking area	D	M	Lo	ST	Significant
<b>A6.8.2 Operation Phase</b>							
A6.8.2.1	Solid Waste Management Issues	Soil, water, and air pollution	D	H	Lo	LT	Significant
A6.8.2.2	Waste water management issues	Water quality and pollution	D	H	Lo	MT	Significant
A6.8.2.3	Groundwater availability and recharge issues	Reduction in the groundwater table	D	H	SS	LT	Significant
A6.8.2.4	Fire, accidental hazard, and emergency preparedness	Accident and loss of life and property	ID	L	SS	LT	Insignificant
A6.8.2.5	Noise pollution	Noise pollution	D	L	SS	MT	Insignificant
A6.8.2.6	Traffic congestion and obstruction	Congestion around the roadsides traffic jam, parking area	D	L	SS	MT	Insignificant
A6.8.2.7	Drainage Management	Inundation of water from urban stormwater	D	M	SS	LT	Significant
A6.8.2.1	Higher energy requirements	High energy demand due to the operation of many electronic appliances	D	H	SS	LT	Significant
<b>Biological Environment</b>							

**Environmental Impact Assessment (EIA) of  
Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery  
Waste)**

<b>A6.9.1</b>		<b>Construction Phase</b>						
A6.9.1.1	Impact on flora and fauna	Loss of biodiversity	D	M	SS	MT	Significant	
A6.9.1.2	Impact on the ecosystem	Ecosystem disruption	D	M	SS	MT	Significant	
<b>A6.9.2</b>		<b>Operation Phase</b>						
A6.9.2.1	Impact on flora and fauna	No impact is identified	-	-	-	-	-	
A6.9.2.2	Impact on the ecosystem	Ecosystem disruption	ID	L	SS	LT	Significant	
<b>Socio-economic and Cultural Environment</b>								
<b>A6.10.1</b>		<b>Construction Phase</b>						
A6.10.1.1	Demographic	No impact is identified	-	-	-	-	-	
A6.10.1.2	Project-associated conflict	Conflict in or with nearby host communities (between local and outsiders)	ID	L	SS	ST	Insignificant	
A6.10.1.3	Gender related issues	Discrimination in opportunity and wages	ID	L	SS	ST	Insignificant	
A6.10.1.4	Health and sanitation around project sites	Incidence of diseases	D	M	SS	ST	Insignificant	
A6.10.1.5	Pressure on utilities and infrastructures	Pressure on public infrastructures and facilities	D	M	SS	ST	Insignificant	
A6.10.1.6	Occupational health and Safety	Accident to the laborers and loss of life	D	M	Lo	ST	Significant	
A6.10.1.7	Grievances management	Conflict and dispute among the workers	ID	L	SS	ST	Insignificant	
<b>A6.10.2</b>		<b>Operation Phase</b>						
A6.10.2.1	Demographic	No impact is identified	-	-	-	-	-	
A6.10.2.2	Occupational health and Safety	Probability of accident and loss of life	D	M	Lo	ST	Significant	
A6.10.2.3	Safety and security of visitors	Crime and disharmony in the society	IN	M	SS	LT	Significant	
A6.10.2.4	Grievances management	Dispute and conflict among the staff and nearby society	ID	L	SS	ST	Insignificant	
<b>Chemical Environment</b>								
<b>A6.11.1</b>		<b>Construction Phase</b>						
A6.11.1.1	Impact due to chemicals for curing and protection of materials	health problem and environmental hazard	D	H	SS	LT	Significant	
<b>A6.11.2</b>		<b>Operation Phase</b>						
A6.11.2.1	Impact due to chemicals like disinfectants, detergents, laboratory chemicals, medicine and pesticides and detergents	Pollute surrounding area and water sources	D	L	SS	LT	Insignificant	

**Notes:** D= Direct; ID= Indirect; H= High; M=Medium; SS= Small scale; Lo= Local; R= Regional; ST= Short Term; LT= Long Term

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 5.12 Impact Analysis by Leopold Matrix Method

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The impacts of the man-made, unlike those of its type, can be assessed using matrix analysis, which is widely known as the Leopold Matrix System among environmentalists worldwide.

The criteria for evaluation of the qualitative matrix are presented here:

### 1) No Impact (0)

This indicates that the project activity is unlikely to affect an environmental attribute.

### 2) Negligible Adverse Impact (-1) / Negligible Beneficial Impact (+1)

It signifies that the actions have a minor effect, adverse or beneficial, on the environmental parameters concerned.

### 3) Significant Adverse Impact (-2) / Significant Beneficial Impact (+2)

The activities and their environmental Impacts are judged to be significant if they create, or have the potential to generate concern in the public or professional community.

### 4) High Adverse Impact (-3) / High Beneficial Impact (+3)

The action can create, or have the potential to create, controversy in the public or professional community, due to its long-term effect. They may be, at times, irreversible.

The matrices for both the construction and operation phases are presented below, considering the environmental attributes discussed in the previous section.

**Project:** Ashulia, Savar Yongli Biotechnology Co. Ltd., an Industrial Protein Powder from Tannery Waste project

**Location:** Ashulia, Savar Sadar Municipality, Ashulia, Savar

#### Project Phases:

- Pre-construction
- Construction
- Operation & Maintenance

#### Scoring Method:

- **Magnitude (M):** -10 (high adverse) to +10 (high beneficial)
- **Importance (I):** 1 (low) to 10 (very high)
- Format: **M / I**

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Table 5-4 Leopold Matrix – Identification and Evaluation of Impacts - Pre-Construction & Construction Phase

Project Activities	Land Use & Soil	Topography & Erosion	Surface Water	Air Quality	Noise & Vibration	Flora & Fauna	Employment	Local Economy
Land acquisition (25.95 acres)	-6 / 7	-5 / 6	-2 / 4	0	0	-4 / 6	+3 / 5	+4 / 6
Site clearing & earthworks	-7 / 8	-8 / 8	-5 / 7	-4 / 6	-4 / 6	-6 / 8	+4 / 5	+4 / 5
Excavation & foundation works	-6 / 7	-7 / 7	-4 / 6	-5 / 6	-5 / 7	-4 / 6	+5 / 6	+5 / 6
Construction of buildings	-4 / 6	-3 / 5	-4 / 6	-6 / 7	-6 / 7	-3 / 5	+7 / 8	+7 / 8
Construction traffic & material transport	-3 / 5	-2 / 4	-3 / 5	-6 / 7	-6 / 7	-2 / 4	+4 / 6	+5 / 7
Labor camps & temporary facilities	-3 / 5	-2 / 4	-5 / 7	-3 / 5	-4 / 6	-3 / 5	+6 / 7	+6 / 7

## Key Construction-Phase Observations

- **Major adverse impacts:** soil erosion, dust, noise, surface water contamination
- **High positive impacts:** employment generation, local business growth
- Impacts are **temporary and reversible** with mitigation

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Table 5-5 Leopold Matrix – Identification and Evaluation of Impacts - Operation & Maintenance Phase

Project Activities	Water Resources	Wastewater	Air Quality	Noise	Public Health	Education	Employment	Socio-economic Development
Industrial Protein Powder from the Tannery Waste project operation	-4 / 7	-6 / 8	-2 / 4	-3 / 5	+9 / 10	+6 / 8	+8 / 9	+9 / 10
GDP Growth	-3 / 6	-4 / 7	-2 / 4	-2 / 4	+10 / 10	+5 / 7	+7 / 8	+9 / 10
Enhance Employment	0	0	0	0	+6 / 8	+10 / 10	+6 / 7	+7 / 8
Biomedical waste generation	-5 / 8	-6 / 9	-3 / 6	-2 / 4	-4 / 7	0	+2 / 4	+3 / 5
Operation of ETP & waste management	+5 / 7	+7 / 8	+2 / 4	0	+6 / 8	0	+2 / 4	+4 / 6
Residential facilities operation	-2 / 4	-3 / 5	-1 / 3	-2 / 4	+4 / 6	0	+5 / 6	+6 / 7

## Key Operation-Phase Observations

- **Very high positive impacts** on:
  - Public health (SDG-3)
  - Medical and nursing education
  - Employment (2,641 personnel)
  - Regional socio-economic development
- **Key adverse risks:** wastewater, biomedical waste

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- These are **manageable with proper ETP, BMW Rules compliance, and monitoring**

### 3. Overall Impact Summary (Leopold Interpretation)

#### Environmental / Social Aspect Net Impact

Land & Soil	Moderate adverse (temporary)
Water Environment	Moderate adverse → manageable
Air & Noise	Short-term adverse
Ecology	Low to moderate adverse.
Public Health	<b>Very high positive</b>
Education	<b>Extremely positive</b>
Employment	<b>Highly positive</b>
Regional Development	<b>Highly positive</b>

### 4. Conclusion Based on the Leopold Matrix

- The **construction phase** results in **moderate, short-term adverse environmental impacts**, which are **localized and reversible**.
- The **operation phase** generates **overwhelming long-term positive impacts**, particularly in:
  - Healthcare accessibility
  - Medical and nursing education

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Employment and socio-economic upliftment of the hill districts
- With proper implementation of:
  - ETP
  - Biomedical waste management
  - Noise and air control measures the project is **environmentally acceptable and socially beneficial.**

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

Table 5-6 Potential impacts due to project construction and operation

No	Impacts	Negative		Positive		No Impact	Magnitude Low - L Medium - M High - H	Mitigation Measures
		Short Term	Long Term	Short Term	Long Term			
<b>A General</b>								
	Displacement of People					√	-	-
	Change of Land use			√			L	N/A
	Loss of trees/vegetation	√					L	Plantation Around the land
	Shifting of utilities					√	-	-
	Impact on archaeological property					√	-	-
<b>B Construction Phase</b>								
	Pressure on local infrastructure	√					L	N/A
	Impact on water quality	√					L	Proper drainage, use substances that protect against the leaching of oil
	Impact on air quality (including dust generation)	√					M	Tarpaulin or jute sheet is use during construction
	Noise pollution	√					M	Use Earplug for personnel, use modern machinery, cover the area
	Traffic congestion	√					L	Traffic management and permit heavy vehicle in the early morning or night
	Disposal of construction debris/material	√					L	Do not dispose anywhere, sell or store
	Public health and safety	√					M	Strictly follow to use of PPE
	Social Impact			√			L	-
<b>C Operational Phase</b>								
	Change in ambient air quality	√					L	Water spray around the project sites
	Impact on water quality		√				L	Proper drainage
	Increase in noise level					√	L	Cover the area and machinery
	Water harvesting and recharge				√		L	-

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	Disposal of solid waste		√				L	Proper waste management as per BD guidelines and other solid waste will be sold to a third party.
	Quality of life				√		M	-
	Contribution to National GDP				√		L	-
	Increment in green cover	√					L	-

### 5.13 Conclusion

It has been noticed from both matrices that the proposed project is basically the construction of a project, namely Ashulia, Savar Leather industries by-products in an efficient manner, and the Nursing College. Hence, no activity is found accountable for creating any significant adverse impact on environmental quality. The impact matrix revealed that noise will be the primary ecological issue during factory construction. Adverse impacts on soil erosion and workers' health & safety due to Factory construction and operation were identified as the most significant. However, those impacts can be reduced to a negligible amount by proper Management measures. Civil works during construction may alter the soil structure in the surrounding area. In furtherance of these, the study and evaluation of impacts have shown that the proposed project would have significant positive impacts, particularly in promoting social, economic, and environmental development, including the development of sustainable alternatives to natural gas, growth in GDP, and the creation of employment opportunities.

It can be concluded that the overall negative impact of various activities on different environmental parameters is negligible when a proper Environmental Management Plan (EMP) is in place. Even negative consequences can be converted into positive, beneficial impacts through adequate and timely implementation of EMP. **Hence, the project can be considered environmentally safe & fit.**

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## CHAPTER 6 PUBLIC CONSULTATION AND EIA REPORT FINALIZATION STRATEGY

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### Public Consultation Approach and Post-Submission EIA Updating Procedure

In accordance with the applicable requirements and procedures of the **Department of Environment (DoE), Government of Bangladesh**, the present document has been prepared and submitted as a **draft Environmental Impact Assessment (EIA) Report** for the proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project**.

The current version of the EIA report is being developed primarily for **initial submission, technical review, and environmental assessment purposes**. Following submission of the draft report, a formal **Public Consultation Program** will be conducted in compliance with prevailing **DoE guidelines, environmental regulations, and EIA procedural requirements**.

### Objective of Public Consultation

The purpose of the public consultation process is to:

- Inform stakeholders about the proposed project.
- Present project activities, potential environmental impacts, and proposed mitigation measures.
- Collect opinions, concerns, recommendations, and feedback from affected and interested stakeholders.
- Enhance transparency, stakeholder participation, and environmental accountability.
- Strengthen the overall environmental assessment process.

### Proposed Stakeholder Consultation Framework

The public consultation process will involve participation of relevant stakeholders, which may include:

- Local community representatives.
- Nearby industries and institutional stakeholders.
- Local government representatives.
- Project area workers and business operators.
- Environmentally affected or interested persons.
- Relevant administrative and technical stakeholders, where applicable.

Consultation activities may be carried out through:

- Public meetings.
- Stakeholder discussions.

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- Focus group discussions (FGD).
- Key informant interviews (KII).
- Community consultation sessions.
- Opinion and feedback collection.

## **Scope of Discussion During Public Consultation**

The consultation program will cover, but not necessarily be limited to, the following aspects:

- Project description and operational overview.
- Proposed industrial protein powder production process.
- Existing environmental condition of the project area.
- Wastewater management strategy including **ETP, STP, and ZLD concept**.
- Air pollution control measures.
- Waste management system.
- Occupational health and safety provisions.
- Water resource protection measures.
- Potential environmental and socio-economic impacts.
- Community concerns and recommendations.

## **Integration of Consultation Findings into the EIA Report**

After completion of the consultation process, all collected stakeholder observations, concerns, and recommendations will be systematically reviewed and evaluated.

The draft EIA report will subsequently be **revised, updated, and strengthened** based on:

- Public consultation outcomes.
- Stakeholder recommendations.
- Community feedback.
- Additional environmental observations.
- Regulatory comments (if applicable).

Where appropriate, the following sections of the EIA may be updated:

- Baseline environmental condition.
- Impact assessment.

## **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- Environmental Management Plan (EMP).
- Monitoring program.
- Risk assessment.
- Community concerns and mitigation measures.
- Water, air, waste, and occupational management components.

### **Commitment to Regulatory Compliance**

The project proponent commits to conducting the consultation process in accordance with the **Department of Environment (DoE) requirements and applicable environmental regulations of Bangladesh.**

The finalized EIA report will therefore represent a **post-consultation updated version**, incorporating stakeholder participation outcomes and reflecting improved environmental management commitments.

The present document represents a **draft EIA report under preparation and submission stage.** Following submission, a structured **public consultation program** will be undertaken according to **DoE procedural requirements.** Based on the consultation findings and stakeholder inputs, the EIA report will be updated and finalized to ensure technical adequacy, regulatory compliance, stakeholder inclusion, and environmentally responsible project planning.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## CHAPTER 7 ENVIRONMENTAL MONITORING PLAN

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### 7.1 Monitoring Requirement

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Environmental monitoring is essential to Environmental Management Systems, providing critical information for rational decision-making. The prime objectives of monitoring are –

- To check whether mitigation and benefit enhancement measures are being adopted and are effective in practice.
- To provide a means whereby impacts that were subject to uncertainty at the time of preparation of EIA, or which were unforeseen, can be identified, and steps to be taken to adopt appropriate control measures.
- To provide information on the actual nature and extent of key impacts and the effectiveness of the mitigation measures, which, through a feedback mechanism, can be taken into account in the planning and execution of similar projects in the future.

There are two basic forms of monitoring:

- Visual observation or a checklist, coupled with inquiries
- Physical measurement of selected parameters.

In general, monitoring in industrial projects is done by physically measuring selected parameters, such as air, water, soil, and noise. The monitoring program should ensure compliance with national environmental standards. This monitoring program is vital for ensuring that the project does not cause adverse ecological impacts in the area and for providing a database of operations and maintenance activities that can be used if unwarranted complaints are made.

### 7.2 Monitoring the Implementation of Mitigation Measures




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To ensure that the recommended environmental mitigation measures are effectively implemented throughout the project lifecycle, a structured Environmental Monitoring and Audit Plan will be followed. This plan involves a combination of site inspections, documentation reviews, water and air sampling, photographic evidence, and regular reporting.

### 7.3 1. Methodology for Monitoring Mitigation Measures

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The following methodology will be adopted to verify that mitigation measures are in place and functioning effectively:

-  **Checklists and Site Audits:** Use of standardized environmental audit checklists during regular site visits to assess compliance with mitigation measures.
-  **Visual Observation:** Monitoring of housekeeping, waste storage, ETP operation, emissions control, and chemical handling areas.
-  **Sample Testing:**

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- **Effluent Sampling:** Collected before and after ETP treatment for pH, BOD, COD, TSS, Color, etc.
- **Ambient Air Quality:** Monitoring of SO<sub>x</sub>, NO<sub>x</sub>, PM<sub>2.5</sub>, near generator zones.
- **Noise Monitoring:** Near generators, heavy machinery zones, and boundary areas.
- **Photographic Records:** Regular photographs of key pollution control units (ETP, solid waste storage, chemical storage, laboratories) and changes in site conditions.
- **Worker Interviews:** Random interviews to assess awareness and implementation of health and safety and environmental practices.

### 7.4 2. Monitoring Locations (with Maps & Photos)

Monitoring will be conducted at the following specific locations:

Monitoring Site	Purpose
ETP+STP Inlet and Outlet	To assess the efficiency of treatment
Generator Emission Points	To monitor air quality
Operation Theater, pathology section	To monitor spill prevention
Solid Waste, Medical waste Storage Yard	To ensure proper segregation
Noise Sensitive Zones (Generator, Boundary)	To measure noise levels
Groundwater Extraction Point (Tube-well)	To monitor water usage and quality

### 7.5 3. Monitoring Schedule and Frequency

Project Phase	Monitoring Activity	Frequency
<b>Construction Phase</b>	Waste handling, noise, air & water quality	Bi-weekly (twice/month)
<b>Machinery Installation</b>	Air, noise, fuel usage, and safety	Weekly
<b>Operational Phase</b>	Full environmental compliance monitoring	Monthly (Routine), Quarterly (Detailed)

### 7.6 4. Reporting and Review Procedure

- **Environmental Monitoring Reports (EMR)** will be prepared **monthly** and **quarterly**, covering:

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- Monitoring data
- Non-compliance events
- Corrective actions taken
- Visual documentation (photos, maps)
- Reports will be submitted to:
  - **Company Management** (monthly internal review)
  - **Department of Environment (DoE)** (quarterly/biannual submission)
- **Annual Environmental Audit:** A certified third-party environmental auditor will review overall compliance, ETP performance, and documentation annually.
- **Corrective Actions:** In case of any non-compliance or failure of mitigation, immediate actions will be recommended and implemented under the supervision of the Environmental Management Officer (EMO).

## 7.7 Personnel Involved in Monitoring

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- **Environmental Management Officer (EMO)** – Overall coordination
- **ETP Supervisor** – Daily log maintenance
- **Safety Officer** – Health and hazard compliance
- **External Environmental Consultant** – Third-party assessment (if required)

## 7.8 Monitoring Indicators

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Environmental monitoring requires a set of indicators that can be conveniently measured, assessed, and evaluated periodically to observe trends in baseline ecological quality. Table 9.1 lists the parameters to be tested, the sample number, and the sampling frequency. Here, it may be noted that the parameters are selected according to the DOE requirements, as specified in the environmental quality standards (EQS) for the concerned industries.

Table 7-1 Monitoring Parameter and Frequency

Issue	Parameters	Location	Monitoring Frequency
Stack Emissions Generator	SPM	Final exhaust	Half-yearly
Waste water treatment plant inlet & outlet water quality	pH, BOD5 at 20°C, COD, Suspended Solids (SS), Color	ETP+STP inlet & Outlet	Half-yearly

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Workplace noise level	Noise level at the workplace	Noise at different locations in the workplace	Half-yearly
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To be an environmentally acceptable project, the proposed project should have its own environmental monitoring unit/cell with trained manpower, the necessary equipment, and other logistics, and the required budget. **Yongli Biotechnology Co. Ltd. (Industrial Protein Powder from Tannery Waste)** should develop a working relationship with the Department of Environment (DOE) by undertaking a joint monitoring program to monitor the above parameters.

## 7.9 Monitoring Plan

Unless specified otherwise, the plant authority should carry out all monitoring activities. For specific purposes, a network should be formed with the plant's workers and employees.

### Water Pollution

- Monitor and control wastewater discharge to the natural drain.
- Monitor compliance with water quality standards set by DoE during construction and operational periods.

Table 7-2 DoE Water Quality Standard for Inland Surface Waters

Parameter	Unit	Recreation activity	Fisheries
pH	-	6.5-8.5	6.5-8.5
BOD mg/l	mg/L	3 or less	6 or less
DO mg/l	mg/L	5 or more	5 or more

Table 7-3 Sewage Water Parameter

Parameter	Unit	Standard Limit
<b>pH</b>	-	<b>6-9</b>
<b>BOD<sub>5</sub> at 20°C</b>	mg/l	<b>30</b>
<b>COD</b>	mg/l	<b>100</b>
<b>Suspended Solids (SS)</b>	mg/l	<b>100</b>
<b>Total Coliform</b>	<b>Number/100 ml</b>	<b>1000</b>

### Noise Pollution

Monitoring actions taken by the authority of the plant to reduce noise and meet DoE guidelines.

Table 7-4 DoE Standards for Sound

Category of areas	Standard determined at dBa unit	
	Day (6 AM-9 PM)	Night (9 PM-6AM)
Silent zone	45	35

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Residential area	50	40
Mixed area	60	50
Commercial area	70	60
Industrial area	75	70

## 7.9.1 Solid Waste Management

Solid waste management is an important component of the environmental management framework for the proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project**. Due to the nature of the production process involving **tannery leather waste processing, hydrolysis, filtration, dechromisation, concentration, spray drying, wastewater treatment, and utility operation**, various categories of solid waste may be generated during project operation.

Improper management of these wastes may create risks related to:

- Soil contamination
- Water pollution
- Odor generation
- Occupational health hazards
- Drainage blockage
- Secondary environmental pollution

Therefore, the project adopts a structured **strategy for solid waste minimization, segregation, treatment, reuse, recycling, and disposal**, consistent with good industrial environmental management practices and applicable **Department of Environment (DoE) requirements**.

The project's solid waste management philosophy is based on the following hierarchy:

**Source Reduction → Segregation → Reuse → Recycling → Safe Disposal**

## 7.9.2 Solid Waste Management

Solid wastes generated during project operation may originate from several operational and utility activities.

### A. Sources of Solid Waste Generation

Major sources of solid waste within the project include:

#### i. Production Process Waste

Generated from:

- Shredding section
- Washing section

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- Filtration section
- Dechromisation section
- Process cleaning operations

Typical wastes may include:

- Leather particles
- Screened solids
- Filtration residues
- Undissolved materials
- Process residue

### **ii. ETP and STP Sludge**

The wastewater treatment systems will generate sludge from:

- Primary clarification
- Chemical treatment process
- Biological treatment units
- Sludge dewatering operations

Potential sludge characteristics:

- Organic solids
- Suspended solids
- Chemical precipitates
- Trace chromium/heavy metal residue (if present)
- Biological biomass

### **iii. ZLD Residual Waste**

Under the proposed **ZLD-oriented wastewater management system**, residual solid waste may be generated from:

- Water recovery operations
- Concentration process

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- Evaporation system residue

## **iv. Chemical Waste**

Generated from:

- Dechromisation chemicals
- Laboratory activities
- Water treatment chemicals
- Chemical containers and packaging

## **v. Domestic and General Solid Waste**

Generated from:

- Staff canteen
- Offices
- Worker facilities
- Packaging and housekeeping activities

Typical waste categories:

- Food waste
- Paper
- Plastic bottles
- Cartons
- Packaging materials

## **B. Potential Environmental Impacts of Improper Solid Waste Management**

If solid wastes are not properly managed, potential environmental impacts may include:

- Soil quality deterioration.
- Groundwater contamination through leachate.
- Surface water contamination during runoff.
- Odor generation from organic wastes.
- Visual pollution.

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- Vector breeding and sanitation issues.
- Worker exposure and occupational hazards.

Therefore, a comprehensive management approach is necessary.

### C. Solid Waste Segregation System

The project will establish a **source-based waste segregation system**.

Separate collection arrangements will be maintained for:

Waste Category	Management Approach
Production Residue	Dedicated industrial waste storage
Sludge Waste	Controlled sludge handling area
Chemical Waste	Hazardous waste containment
Recyclable Waste	Recycling collection system
Domestic Waste	Municipal waste collection

Color-coded and labeled containers will be used where appropriate.

### D. Production Waste Management Strategy

Production-related solid waste will be managed through:

- Source reduction.
- Process optimization.
- Material recovery where technically feasible.
- Designated covered storage areas.
- Regular housekeeping.

Leather residues and screening solids will be collected separately and managed through approved disposal or resource recovery options, depending on material characteristics.

### E. Sludge Management Strategy

Wastewater treatment sludge requires special management due to its potential pollutant content.

The proposed management strategy includes:

## **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- Sludge collection from ETP/STP units.
- Sludge thickening.
- Mechanical dewatering through **filter press** or equivalent system.
- Drying under controlled conditions.
- Temporary storage in secured area.

Final disposal will be undertaken through:

- Authorized disposal route.
- Approved hazardous/non-hazardous management system, depending on sludge characterization.

Periodic laboratory testing may be conducted for:

- Moisture content
- Heavy metals
- Chromium content
- Organic content

### **F. Chemical Waste Management**

Chemical wastes and chemical containers will be handled under controlled procedures.

Measures include:

- Segregated storage.
- Labeling and identification.
- Secondary containment.
- Spill prevention.
- Safe handling training.

Expired chemicals and hazardous residues will be transferred to authorized handlers or approved disposal facilities.

### **G. Domestic Waste Management**

Domestic and office wastes generated by staff will be managed through:

- Waste segregation.
- Covered bins.
- Regular collection schedule.

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- Recycling of suitable materials.
- Transfer to municipal or authorized collection system.

Organic waste from food activities will be handled separately to minimize odor and sanitation problems.

### **H. Waste Minimization and Resource Recovery Measures**

The project will adopt waste minimization measures including:

- Efficient raw material utilization.
- Process optimization.
- Reduction of packaging waste.
- Recycling of suitable materials.
- Water reuse under ZLD framework.
- Improved housekeeping practices.

### **I. Monitoring and Record Keeping**

Solid waste generation and disposal activities will be monitored regularly.

Monitoring measures include:

- Waste inventory records.
- Sludge quantity tracking.
- Disposal documentation.
- Storage condition inspection.
- Housekeeping audits.

Environmental records will be maintained for regulatory compliance and internal environmental management purposes.

### **J. Integrated Solid Waste Management Considering Existing Industrial Context**

An important consideration for this project is the presence of an **existing DoE-approved gelatin manufacturing facility located within the same industrial boundary, approximately 200 feet from the proposed project.**

Since both industries utilize **tannery waste feedstock**, cumulative waste management planning is important.

The proposed project will therefore ensure:

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Independent solid waste handling arrangements.
- Coordinated housekeeping management.
- Controlled storage practices.
- Environmental monitoring of cumulative industrial activities.

### Solid Waste Management Summary Table

Waste Type	Source	Potential Impact	Management Method
Production Residue	Filtration, screening, process cleaning	Soil pollution, odor	Segregation & safe disposal
ETP/STP Sludge	Wastewater treatment	Heavy metal/soil risk	Dewatering + controlled disposal
Chemical Waste	Dechromisation & utilities	Toxic contamination	Secure storage & authorized disposal
Packaging Waste	Raw material & office activities	Visual pollution	Recycling & collection
Domestic Waste	Staff facilities	Sanitation issue	Segregated municipal disposal
ZLD Residual Waste	Water recovery process	Solid residue accumulation	Controlled storage/disposal

The proposed **Industrial Protein Powder from Tannery Waste Project** incorporates a structured and environmentally sound **Solid Waste Management System** based on segregation, safe handling, sludge management, recycling, monitoring, and controlled disposal practices.

With implementation of the proposed measures, potential impacts related to solid waste generation are expected to remain **manageable, environmentally acceptable, and compliant with DoE environmental management requirements**.

### 7.10 Entrepreneurial Responsibilities

To ensure effective monitoring and compliance, the following responsibilities are assigned to the project management:

- **Manpower:**
  - **Environmental Management Officer (EMO)** – 1 (Full-time)
  - **ETP +STP Operator** – 2
  - **Lab Technician** – 1 (for sample collection and coordination with the lab)

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- **Safety Supervisor** – 1 (overseeing chemical & occupational safety)
- **Technical Advice & Support:**
  - Regular consultation with certified environmental consultants
  - Capacity-building training for staff on waste management and ETP operation

## 7.11 Monitoring Reporting

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- **Internal Reports:**
  - **Monthly Environmental Status Report** to be prepared by EMO covering:
    - Effluent discharge summary
    - Air and noise measurement results
    - Waste generation and disposal log
    - ETP operational log
- **External Reports:**
  - **Quarterly Monitoring Report** to be submitted to the **Department of Environment (DoE)**.
  - **Annual Environmental Compliance Report (AECR)** and **Third-party Environmental Audit Report** (if required by DoE or during license renewal).
- **Record Keeping:**
  - All reports, test results, photographs, and waste manifests will be documented and stored for at least **five years** for reference and regulatory review.

## 7.12 Management of different Environmental Aspects based on Identified Impacts

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### 7.12.1 Management measures for the Air Environment during

#### *Construction phase*

- Diesel-driven construction machinery and equipment shall be fitted with appropriate silencers, will not be left idle for prolonged periods of time, and will be subjected to regular scheduled maintenance to minimize the exhaust emissions.
- Vehicle engines shall not be left running when not in use.
- Improperly functioning equipment and vehicles shall be removed from the project site or shall be repaired before returning to service.
- The contractor working on the project shall ensure that waste arising from construction activities on site is not burnt on the premises.

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- Water sprinklers will be used to control the fugitive dust.

## *Operation phase*

- All roads should be paved to reduce pollution levels.
- Emissions from equipment/machinery & vehicles shall be monitored regularly.
- All necessary equipment/machinery shall be in good condition for proper operation.
- Employees shall be provided with sufficient environmental management & safety materials. They shall be given appropriate training, as well as a display of the summarized Environmental Management & Safety Procedures, which shall be made available at the site through a signboard.
- Regular Air monitoring and inspection of the environmental management practices shall be carried out, and the necessary documents & records shall be maintained.
- The Project authority should check the quality of the gases emitted by the generator at regular intervals to monitor its performance. If the result shows that the emitted air doesn't comply with any standard, mitigation measures must be taken based on the situation.
- The sources of air pollutants are burning fuel. During operation, these sources would emit the exhaust gases containing CO<sub>2</sub>, NO<sub>x</sub>, SO<sub>2</sub>, and a negligible quantity of particulate matter (PM<sub>10</sub>). Control of air pollutants from these sources would be achieved by safe dispersal, providing adequate heights to the respective exhaust ducts, improving the combustion process, and installing an air pollution controller system if necessary.

## 7.12.2 Management Measures for Water Environment

Effective management of the water environment is a critical component of the Ashulia, Savar Yongli Biotechnology Co. Ltd., Industrial Protein Powder from Tannery Waste project, Yongli Biotechnology Co. Ltd., , and Nursing College Project due to the sensitivity of surrounding surface water bodies, hilly terrain, and proximity to Ashulia Water body. The proposed mitigation and management measures have been planned for both the **construction and operation phases, with adequate financial allocations** already incorporated in the **Development Project Proforma (DPP)**.

### 7.12.2.1 Construction Phase Water Environment Management Measures

During the construction phase, potential impacts on the water environment may arise from surface runoff, wastewater generation, accidental oil spills, and improper waste handling. The following management measures will be strictly implemented:

#### 1. Control of Surface Runoff and Erosion

- Temporary drainage channels, silt traps, and sedimentation pits will be constructed to control runoff and prevent soil erosion.
- Excavated areas will be covered during rainfall to minimize sediment transport into nearby water bodies.

#### 2. Wastewater Management

## **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- Wastewater generated from construction activities, equipment washing, and labor camps will be treated through **temporary sedimentation tanks and soak pits** before discharge.
  - No untreated wastewater will be discharged into natural water bodies or nearby drains.
- 3. Prevention of Oil and Chemical Contamination**
- Construction machinery will be regularly maintained to prevent leakage of oil, fuel, and lubricants.
  - Designated impervious platforms will be used for refueling and maintenance of equipment.
  - Storage of construction chemicals, paints, and solvents will be done in secured, covered areas.
- 4. Protection of Nearby Surface Water Bodies**
- Buffer zones will be maintained between construction activities and nearby ponds, streams, and natural drainage channels.
  - Direct disposal of construction waste, spoil, or wastewater into water bodies will be strictly prohibited.
- 5. Monitoring and Supervision**
- Regular inspection of drainage systems and wastewater handling facilities will be conducted by the Environmental Management Unit (EMU).
  - Immediate corrective action will be taken in case of any accidental discharge or contamination.

The above measures will ensure that **construction-related impacts on surface water and groundwater remain minimal and localized.**

### 7.12.2.2 Operation Phase Water Environment Management Measures

During the operation phase, the Industrial Protein Powder from Tannery Waste project and educational facilities will generate significant volumes of **sewage and medical wastewater**, which require specialized treatment to protect public health and the surrounding environment. To address these impacts, a comprehensive water management system has been planned and budgeted.

#### **a) Installation of Effluent Treatment Plant (ETP) and Sewage Treatment Plant (STP)**

- The project will install an integrated **Effluent Treatment Plant (ETP) and Sewage Treatment Plant (STP)** to treat:
  - Industrial Protein Powder from Tannery Waste project wastewater (from wards, laboratories, operation theatres, laundries)
  - Domestic sewage (from hostels, dormitories, staff quarters, kitchens, and toilets)
- The STP will be designed to meet the **Department of Environment (DOE), Bangladesh discharge standards.**

# **Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)**

- Treated effluent will be reused for **toilet flushing, landscaping, gardening, and road washing**, thereby reducing freshwater demand.

**Estimated Budget (as per DPP, Page 219):** Sewage Treatment Plant (STP): **BDT 75,000,000.00**

## **b) Medical Wastewater and Liquid Waste Management**

- Wastewater generated from medical and laboratory activities containing pathogens, chemicals, and disinfectants will be pre-treated before entering the central treatment system.
- Segregation of highly infectious liquid waste at source will be ensured.
- Chemical neutralization and disinfection processes will be applied where required to reduce biological and chemical loads.

**Estimated Budget for Medical Waste Management (as per DPP, Page 219):**

- Industrial Protein Powder from Tannery Waste Management System: **BDT 165,000,000.00**

## **c) Protection of Surface Water and Groundwater**

- No untreated wastewater will be discharged into nearby surface water bodies, including **Ashulia Water body or natural drainage channels**.
- Regular monitoring of treated effluent quality (pH, BOD, COD, TSS, pathogens) will be conducted.
- Groundwater abstraction will be regulated, and rainwater harvesting will be implemented to enhance groundwater recharge.

## **d) Drainage and Stormwater Management**

- Separate stormwater drainage systems will be provided to prevent mixing of rainwater with sewage.
- Stormwater drains will be designed considering the hilly terrain and high rainfall characteristics of Ashulia, Savar.
- Regular cleaning and maintenance of drains will be ensured to prevent clogging and overflow.

## **e) Institutional and Monitoring Measures**

- An **Environmental Management Unit (EMU)** will be responsible for operation, monitoring, and maintenance of the ETP and STP.
- Standard Operating Procedures (SOPs) will be developed for wastewater treatment operations.
- Periodic reporting to the Department of Environment (DOE) will be ensured as per regulatory requirements.

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## 7.12.2.3 Overall Effectiveness of Water Environment Management

With the implementation of the above measures and **adequate financial provision in the DPP**, the project is expected to:

- Prevent surface water and groundwater contamination
- Ensure safe management of medical and domestic wastewater
- Protect Ashulia Water body and surrounding ecosystems
- Promote sustainable water use and environmental compliance

Therefore, the residual impacts on the water environment during both construction and operation phases will be **low and environmentally manageable**.

## 7.12.3 Management Measures for Terrestrial Biodiversity

### Construction phase

Regular monitoring shall be conducted to prevent contamination of natural habitats. The significant impacts would be on terrestrial ecology. Care should be taken during construction to ensure it does not affect terrestrial inhabitants.

### Operation phase

- Disposal of effluent & sewage shall not be made into nearby or adjacent water bodies or other ecological habitats to prevent impacts on the environmental structure & habitat of the area.
- Any solid waste shall not be dumped into the marine environment, nor on the land of the premises /surrounding area.
- Contamination of marine water caused by any means of project operation shall be avoided to prevent adverse impacts on ecology.
- Regular monitoring of the local area shall be conducted to assess any residual effects on the local ecology from the project's operations. Necessary technologies/facilities for the prevention of such effects shall be provided immediately by the project proponent.

## 7.13 Management Measures for Socio-economic Environment

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### Construction Phase

A significant affirmative impact of the proposed project will be the creation of direct & indirect employment and the uplifting of the economic status of people living in the nearby area. Local population would also get opportunities in related services activities like small contractors, sub-contractors, supply of construction materials, supply of basic facilities like eatables to the site etc. The construction activities will generate significant employment in ancillary activities.

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## **Operation Phase**

The proposed project shall result in significant employment during the operation. The proponent shall give priority to the appointment of local people to the maximum extent during the employment process for the proposed project. Safety training shall be provided to all workers. The workers shall pass through the medical examination prior to recruitment and periodic medical checkup shall also be carried out. An emergency response plan and disaster management plan shall also be placed to take care of adverse impact in case of any incident of accident. Such plans shall also be helpful to the local area during the incidence of Natural Disaster.

## **7.14 Occupational Health and Safety**

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The contractors shall also be briefed on the conditions imposed by regulating agencies on the project, the potential problems and Management measures and their obligations in the meeting those requirements. Proponent shall ensure that the contractors implement their instructions properly while constructing by incorporating appropriate conditions in the contract documents. Some of the safety aspects to be implemented are as under:

- Monitoring safe working procedures through safety work permit system and provided safety supervision.
- Safety audit of mechanical equipment and electrical installations.
- Distribution and storage of personnel protective equipment and first-aid items to all working groups and offices.
- Preparation and updating of safety standards and safe working procedures.
- Accident investigation, emergency handling and documentation of accident reports.
- Planning, organizing and conducting training programs for employees on safety, safe working procedures for various related activities.
- Planning, organizing, and conducting safety awareness programs for contractors and the community.
- Welding and painting will be carried out after temporary enclosures are provided against wind, etc., if necessary.

### **7.14.1 Work-related injuries**

All occupational accidents should be notified to the family of the accident victim which should be informed as soon as possible and as required by national laws or regulations to the authority, the labor inspectorate the appropriate insurance or any other.

- (a) Immediately after reporting of an occupational accident-causing loss of life.
- (b) Within a prescribed time for other occupational accidents. with a view to meeting the requirements of labour inspectorates, insurance institutions and the statistics producing body the forms prescribed in either a specific or single format should include at least the following minimum information on
  - (a) Facility and employer
  - (b) Injured person (name, address, sex, and employment status, occupation,

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(c) Type nature and location of injury, (d) accident and its sequence (geographical location of the place of the accident, date and time, action leading to injury-type of accident).

National laws or regulations should provide for the specification of the relevant necessary information to be notified for commuting accidents and of more detailed information if available.

## **7.15 Afforestation**

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Trees and plants are well known for trapping noise, particulate matters, and gaseous pollutants, in controlling soil erosion and ground water charging. Green Belt has to be developed outside of plant premises adjacent to northern, western and southern boundary of the plant. The selection of plant species shall be made in consultation with local forest officials. Grassy lawns and gardens shall be developed in vacant areas within the plant premises under beautification scheme to increase the aesthetic value.

## **7.16 Costing of EMP**

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As mentioned earlier, no significant environmental pollution from Yongli Biotechnology Co. Ltd. (Industrial Protein Powder from Tannery Waste) occurred. So, the capital investment required for organizational management in implementing EMP.

**EMP Costing Summary for Ashulia, Savar Yongli Biotechnology Co. Ltd., & Industrial Protein Powder from Tannery Waste project It is fully described in the DPP.**

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Table 7-5 Environmental Management Action Plan for Construction Phases

Environmental Impact	Mitigation Measures	Time Frame	Location	Responsibility
Air pollution	<ul style="list-style-type: none"> <li>➤ All materials transported to and from the construction site should be covered.</li> <li>➤ Temporary stockpiles of soil or other material should be covered or sprayed with water on a regular basis, particularly during dry or windy conditions.</li> <li>➤ Water should be used to suppress dust on temporary roadways and other exposed areas.</li> <li>➤ The project site should be surrounded by boundary wall;</li> <li>➤ Workers in the site should be issued with dust masks during dry and windy conditions;</li> <li>➤ Vehicles and other machinery should clear off mud before leaving the site;</li> </ul>	Throughout the construction phase	Project site	Contractor
Soil Erosion and siltation	<ul style="list-style-type: none"> <li>➤ Prefer the dry season for starting construction work. In case of working in the rainy season, install a barrier net.</li> <li>➤ Re-cover exposed soils with grass and other appropriate species as soon as possible;</li> <li>➤ Pile up spoil soil on a flat surface away from the drain.</li> <li>➤ Prevent <b>slope failure, landslides, and soil erosion</b></li> <li>➤ Maintain <b>long-term geotechnical stability</b> of cut and filled slopes</li> </ul>	Throughout the construction phase	Project site	Contractor

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	<ul style="list-style-type: none"> <li>➤ The authority has constructed RCC boundary walls along approximately <b>1,700 meters</b> of the project perimeter.</li> <li>➤ Retaining walls covering an approximate total area of <b>20,403.65 square meters</b> have been built at critical locations within the project site.</li> <li>➤ Control <b>surface runoff and sediment transport</b></li> <li>➤ Protect <b>adjacent natural drainage, vegetation, and built infrastructure</b></li> <li>➤ Ensure compliance with <b>DoE (Bangladesh) EIA guidelines</b> and hill-area development best practice</li> </ul>			
Noise and vibration	<ul style="list-style-type: none"> <li>➤ Construction activities that will generate disturbing sounds should be restricted to regular working hours.</li> <li>➤ If required, residents should be given notice of the noise activities to reduce the degree of annoyance.</li> <li>➤ Workers use earplugs while working with a noisy device.</li> </ul>	Throughout the construction phase	Project site	Contractor
Impact on groundwater	<ul style="list-style-type: none"> <li>➤ Ensure minimum extraction of groundwater;</li> <li>➤ Water waste should be avoided through monitoring.</li> </ul>	Throughout construction phase	Project site	Contractor
Solid waste	<ul style="list-style-type: none"> <li>➤ Provide space for temporary disposal of solid waste in the site and dispose of the waste properly;</li> <li>➤ Arrange adequate sanitation facilities for workers;</li> <li>➤ Follow up to ensure appropriate waste disposal and sanitation practices by contractor and construction workers;</li> </ul>	Throughout the construction phase	Project site	Contractor

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Impact on Biodiversity	<ul style="list-style-type: none"> <li>➤ Avoid unnecessary cutting of trees;</li> <li>➤ Allocate space for green belt development;</li> </ul>	Throughout construction phase	Project site	Contractor
Impact on traffic volume	<ul style="list-style-type: none"> <li>➤ Control vehicle movement in an organized way and follow local traffic instructions;</li> </ul>	Throughout the construction phase	Material Transport Route	Driver
Fire/Explosion	<ul style="list-style-type: none"> <li>➤ Establish own firefighting system and maintain collaboration with government firefighting and civil defense department locally;</li> <li>➤ Organize fire drills and training for construction staff;</li> </ul>	Throughout construction phase	Project site	Contractor
Employment generation	<ul style="list-style-type: none"> <li>➤ Employment of only construction workers;</li> </ul>	Throughout construction phase	Project site	Contractor
Occupational Health and safety risk	<ul style="list-style-type: none"> <li>➤ Create awareness of safety issues among workers and contractors;</li> <li>➤ Monitoring the practice of following safety guidelines by workers and contractors;</li> <li>➤ Ensure the use of appropriate PPE while working on the construction site and display proper safety signs in the project site.</li> </ul>	Throughout the construction phase	Project site	Contractor

Table 7-6 Environmental Management Action Plan for Operation Phases

Environmental Impact	Mitigation Measures	Time Frame	Location	Responsibility
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**Environmental Impact Assessment (EIA) of  
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Waste)**

Air pollution	<ul style="list-style-type: none"> <li>➤ Provide adequate ventilation and an exhaust fan in the workplace.</li> <li>➤ Spray water on bare soil.</li> <li>➤ Maintain open air exhaust for the generator and set the The Catalytic converter and the faulty engine would be repaired as soon as possible.</li> <li>➤ Plant a tree near the boundary line or in the green area.</li> <li>➤ Monitoring SPM every 06 Months;</li> </ul>	Throughout the Operation phase	Project site	Representative of project proponent
Liquid waste	<ul style="list-style-type: none"> <li>➤ The authority will implement the ZDP plan</li> <li>➤ Install ETP+STP to treat the wastewater and reuse it</li> </ul>			
Solid waste	<ul style="list-style-type: none"> <li>➤ Apply the 3R method to the project's waste management.</li> <li>➤ Train employees on waste control and disposal procedures;</li> <li>➤ Segregates wastes at source and stores in demarcated places;</li> <li>➤ Spent lube oil will be sold only to a DoE-approved vendor.</li> </ul>	Throughout the Operation phase	Project site	Representative of the project proponent
Noise and Vibration	<ul style="list-style-type: none"> <li>➤ An air plug will be provided to workers while near noise-generating equipment or working in a noisy area.</li> <li>➤ Conduct periodic maintenance of the generator.</li> <li>➤ Will procure a noise monitoring device and monitor noise conditions in and outside the project premises;</li> <li>➤ Monitoring noise conditions every 06 months;</li> </ul>	Throughout the Operation phase	Project site	Representative of the project proponent
Impact on soil or land	<ul style="list-style-type: none"> <li>➤ Maintain yard cleanliness and store solid waste in the waste bin.</li> <li>➤ Green belt development for enhancing the natural aesthetic of the site;</li> </ul>	Throughout the Operation phase	Project site	Representative of the project proponent

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Impact on traffic volume	<ul style="list-style-type: none"> <li>➤ Control vehicle movement in an organized way and follow local traffic instructions.</li> </ul>	Throughout the Operation phase	Project site	Representative of the project proponent
Fire/Explosion	<ul style="list-style-type: none"> <li>➤ Establish your firefighting system and collaborate locally with the government firefighting and civil defense department.</li> <li>➤ Organize fire drill and training for construction staff;</li> </ul>	Throughout the Operation phase	Project site	Representative of the project proponent
Occupational health and safety risk	<ul style="list-style-type: none"> <li>➤ Conduct job safety analysis;</li> <li>➤ Use personal protective equipment, such as a hard helmet, mask, boots, and eyeglasses.</li> <li>➤ Aware and train employees on using safety devices;</li> </ul>	Throughout the Operation phase	Project site	Representative of the project proponent
Statutory requirements	<ul style="list-style-type: none"> <li>➤ Meet all statutory requirements with DoE within the time frame;</li> </ul>	Throughout the Operation phase	Project site	Representative of the project proponent

Table 7-7 Environmental Management Action Plan

Issue/Concern	Potential negative environmental impacts	Mitigation measures	Environmental Monitoring	Responsible actors	Time frame
Water Pollution	<ul style="list-style-type: none"> <li>- Surface and ground water pollution</li> <li>-Occupational illness</li> </ul>	<ul style="list-style-type: none"> <li>- water filtration</li> <li>- Will establish a septic tank, and 30 m<sup>3</sup> per hour STP</li> </ul>	-Monitoring of water quality	<ul style="list-style-type: none"> <li>-Authority &amp; workers</li> <li>- Health and safety officer</li> </ul>	- Quarterly reporting
Solid waste	<ul style="list-style-type: none"> <li>- Air, water and soil pollution</li> <li>-Poorly disposed waste may block drainage</li> </ul>	<ul style="list-style-type: none"> <li>- Proper solid waste management system</li> <li>- Sale of solid waste to a third party.</li> </ul>	- Regular monitoring of the solid waste management facilities	<ul style="list-style-type: none"> <li>-Authority &amp; workers</li> <li>- Health and safety officer</li> <li>- Neighbors and</li> <li>- The general Public</li> </ul>	<ul style="list-style-type: none"> <li>-Must be keep inventory/daily register for solid waste</li> <li>- Quarterly reporting</li> </ul>

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		<ul style="list-style-type: none"> <li>- Solid waste collection, storage, and transportation system</li> <li>- Awareness and training campaign</li> </ul>			
Air Pollution	<ul style="list-style-type: none"> <li>- Deterioration of indoor air quality</li> <li>-Occupational illness/health impact</li> </ul>	<ul style="list-style-type: none"> <li>- Proper stack height for generator</li> <li>-Regular maintain of Generators</li> <li>-Use of PPE</li> </ul>	-Monitoring of AIR quality	<ul style="list-style-type: none"> <li>-Authority &amp; workers</li> <li>- Health and safety officer</li> </ul>	- Half yearly Air quality monitoring (Only SPM)
Noise Pollution	<ul style="list-style-type: none"> <li>- Hearing loss</li> <li>-Reduced productivity and efficiency</li> <li>-Fatigue, headache, nervousness, irritability and high pretension resulting in accidents at workplace</li> </ul>	<ul style="list-style-type: none"> <li>- Implementation an effective noise control and hearing conservation program</li> <li>-Noise measurement</li> <li>-Providing suitable hearing protection to all workers</li> <li>-Training of workers</li> </ul>	-Determine Noise levels from time to time	<ul style="list-style-type: none"> <li>-Authority &amp; workers</li> <li>- Health and safety officer</li> <li>- Neighbors and</li> <li>- The general Public</li> </ul>	- Half yearly Noise level monitoring
Occupational hazards	<ul style="list-style-type: none"> <li>- Injury to employees on site</li> <li>-Injury to visitors</li> <li>- Reduced productivity</li> <li>- Plant and equipment damage</li> <li>-Negative corporate image</li> </ul>	<ul style="list-style-type: none"> <li>- Good and sound housekeeping practices</li> <li>-Provision of appropriate working tools and equipment</li> <li>-Use of PPE</li> <li>-Timely repair and maintenance of plant and equipment</li> <li>-Employee training</li> <li>-Use appropriate elevators and other lifting machinery</li> </ul>	<ul style="list-style-type: none"> <li>-Accident and incident records</li> <li>-Record of employee training</li> </ul>	<ul style="list-style-type: none"> <li>-Authority &amp; workers</li> <li>- Health and safety officer</li> </ul>	- The mitigation measures proposed should be put in alongside project implementation and daily operations, continuously improved on and sustained throughout the operation life of the project.

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## 7.17 Disaster Management Plan (DMP)

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### 7.17.1 Approach to Disaster Management Plan

On-site emergency or disaster is an unpleasant, sudden event of such magnitude that may cause extensive damage to life and property due to in-plant emergencies resulting from deficiencies in operation, maintenance, design, and human error; natural calamities like floods, cyclones and earthquakes; and deliberate and other acts of a man, like sabotage, riot, war, etc. Every industry needs a well-documented Emergency Plan to address major untoward incidents or disasters. Because of this, an approach to the Disaster Management Plan (DMP) to tackle the emergencies, the proposed project has been delineated in the following sections. The roles and responsibilities of key personnel have also been defined in the plan.

### 7.17.2 Formulation of DMP and Emergency Services

Proposed **YONGLI BIOTECHNOLOGY CO. LTD. (INDUSTRIAL PROTEIN POWDER FROM TANNERY WASTE)** will formulate a Disaster Management Plan for better and safer management of their plants. The DMP is related to the final assessment, and it is the responsibility of the plant management to document, including the following elements.

- Assessment of the size and nature of the events foreseen and the probability of their occurrence;
- Formulation of the plan and liaison with authorities, including the emergency services.
- Procedures for raising the alarm and communications both within and outside the works;
- Appointment of key personnel and their duties and responsibilities, especially for works incident controller and works main controller;
- Emergency control center;
- Action on-site;
- Action off-site;

The plan is prepared to set out how designated personnel at the incident site can initiate supplementary action, both inside and outside the works, at an appropriate time. An essential element of the plan must be the provision for attempting to make the affected unit, for example, by shutting it down. The plan includes the entire sequence of key personnel to be called in from other sections or off-site on a complex site.

### 7.17.3 Need for Disaster Management Plan

The proposed project will not produce any potentially hazardous material to human beings, flora, fauna, or the environment. Despite these, the possibility of accidents cannot be ruled out. Human errors and mechanical, electrical, instrumental, or system failures have occasionally led to severe disasters. The following are the general types of Emergencies/Disaster that lead to the preparation of a disaster management plan:

- Fire from a gas cylinder explosion

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- Fire from an electric short circuit
- Earthquake
- Flash flood
- Landslide

## 7.17.4 Objectives of Disaster Management Plan

DMP aims to provide detailed guidance on organizational responsibilities, actions, reporting requirements, and available support resources to ensure effective and timely management of emergencies associated with production and operations on the site. The overall objectives of DMP are to:

- Ensure the safety of people, protect the environment, and safeguard commercial considerations
- Immediate response to the emergency scene with an effective communication network and organized procedures
- Obtain early warning of emergency conditions to prevent impact on personnel, assets, and the environment
- Safeguard personnel to prevent injuries or loss of life by protecting them from hazards and evacuating them from an installation when necessary.
- Minimize the impact of the event on the installation and the environment by:
  - Minimizing the hazard as far as possible
  - Minimizing the potential for escalation
  - Containing any release
- To guide to help stock holders take appropriate action to prevent accidents involving hazardous substances and to mitigate adverse effects of accidents that do nevertheless occur.

## 7.18 Emergency Response and Disaster Management Plan

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The initial response to an incident is a critical step in the overall emergency response. Like all other industries and installations. Project authorities must have adequate measures in place to prevent accidents and incidents, and to respond to emergencies. The purpose of having an Emergency Response Plan (ERP) is to:

- Assist personnel in determining the appropriate response to emergencies.
- Provide personnel with established procedures and guidelines.
- Notify the appropriate company emergency response team personnel and regulatory Govt agencies.
- Manage public and media relations.
- Notify the next of kin of accident victims.

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- Promote inter-departmental communications to ensure a “Companywide” Coordinated emergency response.
- Minimize the effects that disruptive events can have on company operations by reducing recovery times and costs.
- Respond to immediate requirements to safeguard the subtending environmental and community.

Generally, the initial response is guided by three priorities Ranked in importance these priorities are:

1. **People**
2. **Property**
3. **Environment**

Emergency response procedures will identify who does what and when in the event of an emergency. Responsibility for who is in charge and their coordination of emergency actions shall be identified. Nature of emergency& Hazardous situations may be of any or all of the following categories:

## **I. Emergency**

- Fire,
- Explosion
- Medical emergency,

## **II. Natural Disasters**

- Flash Flood,
- Earthquake,
- Landslide

## **III. External factors**

- Food poisoning/water poisoning
- Sabotage

### **7.18.1 Six Steps in Emergency Response**

#### **First Step:**

This step determines the potential hazards associated with the incident, substance or circumstances and take appropriate action identify the type and qualities of dangerous goods involved and any known associated hazards.

It also determines potential hazards stemming from local conditions such as inclement weather water bodies etc. and ensure that the initial response team is aware of these conditions.

#### **Second Step:**

Determine the source/cause of the event resulting to the emergency and prevent further losses.

#### **Third Step:**

Conduct an assessment of the incident site for any further information on hazards or remedies.

#### **Fourth Step:**

Initiate redress procedures.

#### **Fifth Step:**

Report the incidence, its nature, cause, impact, applied redress procedures, and any further assistance required, etc., to the appropriate company, government, and/or land owner.

#### **Sixth Step:**

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Take appropriate steps with respect to hazards to wildlife, other resources and addressing public and media concerns and issues, as applicable. Response priorities are to protect human lives, property and the environment.

## 7.18.2 Emergency Response and Fire Management Plan

If a small fire cannot be extinguished with the use of a portable extinguisher or a fixed extinguishing system, or the smoke presents a hazard to the operator, then leave the fire area, ensure the fire department has been notified, and wait in a safe area for the fire department. Attempting to extinguish a fire is a voluntary act. Only persons who are properly trained and feel confident in the use of a portable extinguisher should contemplate their use. Improper use of a portable extinguisher can lead to severe injury or death.

### 7.18.2.1 Types of Fire

There are five types of fire such as

Class A – Ordinary combustibles (wood, paper, plastics, etc.)

Class B – Combustible liquids (oils, gas, cooking oil, etc.)

Class C – Electrical (energized equipment – appliances, wiring, etc.)

Class D – Combustible metals (aluminum, magnesium, zinc, etc.)

Class E – Commercial cooking equipment (Cooking oils, Animal fats, Vegetable fats)

It is extremely important to choose the properly rated fire extinguisher for the class of fire that is burning.











		Ordinary Combustibles	Wood, Paper, Cloth, Etc.
		Flammable Liquids	Grease, Oil, Paint, Solvents
		Live Electrical Equipment	Electrical Panel, Motor, Wiring, Etc.
		Combustible Metal	Magnesium, Aluminum, Etc.
		Commercial Cooking Equipment	Cooking Oils, Animal Fats, Vegetable Oils

Figure 7-1 Pictorial View of Different Types of Fire

### 7.18.3 Fire Safety Risk Assessment

A fire safety risk assessment is an organized, methodical assessment of the premises, the activities within them, the potential for a fire to occur, and the harm it could cause to people in and around the premises. The prescribed process is available for inside or indoor fire risk assessment. The following fire risk assessment process can be followed and executed twice a year.

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## 7.19 Emergency Response Plans to Disaster

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Emergency response plans are developed to address a range of plausible risk scenarios and emphasize the tasks required to respond to a physical event. The emergency response plan (ERP) for the proposed factory has been developed, listing actions to be performed within a very short period in a predetermined sequence to effectively and efficiently address any emergency, major accident, or natural disaster. The primary objective of the plan is to minimize loss of life, material damage, damage to machinery and equipment, and environmental impacts.

### 7.19.1 Alarm system

The alarm system varies and will depend on the size of the works area - simple fire bell, hand-operated siren, break-open type, fire alarm, etc.

### 7.19.2 Communication System

Communication is a key component in controlling an emergency. The following communication system may be provided in the project:

- Walky-talky
- Telephone
- Cell phone
- Intercom/paging
- Runners (verbal or written messages)

### 7.19.3 Siren for emergency

The emergency siren should be different from a standard siren. The emergency siren should be audible at a distance of 5km. The emergency siren should be used only in emergencies.

### 7.19.4 Escape Route

The escape route from each plant should be clearly marked, and the authority has already marked the emergency escape route on every floor. The escape route is the shortest path to reach the open area from the factory, leading to the assembly point. This route should be indicated on the layout plan attached to the on-site management plan.

### 7.19.5 All clear signal

After control of the emergency, the work incident controller will communicate to the work's central controller that the emergency has ceased. The central controller can declare all clear by instructing the time office to sound "All Clear Sirens".

### 7.19.6 Emergency facilities

The following facilities should be provided to address emergencies at any time.

- ✓ Fire protection and firefighting facilities
- ✓ Emergency lighting and standby power
- ✓ Emergency equipment and rescue equipment

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- ✓ Breathing apparatus with compressed air cylinder
- ✓ Fire proximity suit
- ✓ Resuscitator
- ✓ Water gel blanket
- ✓ Low-temperature suit
- ✓ Fire aid kit
- ✓ Stretchers

# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

## CHAPTER 8 CONCLUSIONS AND RECOMMENDATIONS

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### 8.1 Conclusions

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The Environmental Impact Assessment (EIA) for the proposed **Ashulia, Savar Yongli Biotechnology Co. Ltd., Industrial Protein Powder from Tannery Waste project, located at Takshur, Mirzanagar, Ashulia, Savar, Dhaka**, has been conducted in accordance with the requirements of the **Bangladesh Environmental Conservation Act, 1995**, and the **Environmental Conservation Rules 2023 (as amended)**. The study included a baseline environmental assessment, stakeholder consultation, the identification and evaluation of potential impacts, and the formulation of mitigation and management measures.

The project has been proposed to produce Industrial Protein Powder from Tannery Leather Waste, with an annual production capacity of approximately 5,000 Metric Tons. The final product will primarily be used in **leather softening and leather polishing applications**.

The environmental assessment indicates that the proposed project is technically feasible, environmentally manageable, and industrially compatible with the surrounding environment, subject to implementation of the recommended environmental management measures.

An important consideration in the assessment is that the proposed facility will be established within an existing industrial setting where a **DoE-approved tannery waste-based gelatin manufacturing facility** is already operating inside the same boundary, approximately **200 feet from the proposed project shed**. The existing industry converts tannery waste into **gelatin for pharmaceutical capsule shell production**.

Therefore, the proposed project represents a **compatible industrial expansion utilizing similar feedstock**, rather than introduction of an entirely new industrial activity into a previously undisturbed environment.

The environmental baseline investigation indicates that:

- The project area is predominantly industrial in character.
- Surface water resources, particularly the nearby **Government Khal**, remain environmentally sensitive receptors.
- Ecological sensitivity within the project influence zone is relatively low.
- No protected forest, wildlife sanctuary, ecological critical area, or major environmentally restricted zone has been identified within the immediate project influence area.
- The socio-economic environment is strongly linked with industrial activities and labor-based economic systems.

The assessment identified several potential environmental concerns associated with project operation, including:

- Wastewater generation from washing, hydrolysis, filtration, and dechromisation processes.

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- Air emissions associated with spray drying, generator operation, and material handling.
- Solid waste generation including process residues, sludge, and packaging waste.
- Chemical handling risks.
- Noise generation from industrial equipment.
- Occupational health and safety considerations.
- Potential cumulative environmental interaction with the adjacent gelatin manufacturing facility.

However, the study concludes that these environmental impacts are **manageable through appropriate engineering design, environmental safeguards, and operational control systems**.

The project proposes a comprehensive environmental management framework including:

- **150 m<sup>3</sup>/day Effluent Treatment Plant (ETP)**.
- Separate **Sewage Treatment Plant (STP)** for domestic wastewater.
- **Zero Liquid Discharge (ZLD)-oriented reuse concept**.
- Air pollution control systems.
- Chemical handling and storage procedures.
- Solid waste management system.
- Occupational health and safety program.
- Environmental monitoring and compliance framework.

Under the proposed management arrangement:

- No untreated wastewater will be discharged outside the project boundary.
- No direct discharge to nearby **Government Khal** or surrounding surface water bodies is anticipated.
- Internal water recovery and reuse practices will reduce freshwater demand.
- Waste management and pollution prevention systems will minimize environmental risk.

From a socio-economic perspective, the project is expected to generate several positive outcomes, including:

- Employment generation.
- Resource recovery from tannery waste.
- Industrial value addition.

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- Economic activity enhancement.
- Strengthening of circular economy and waste utilization practices.

Based on the findings of this assessment, the proposed project is considered **environmentally acceptable**, provided that all recommended environmental protection and monitoring measures are effectively implemented throughout construction and operational phases.

## 8.2 Recommendations

To ensure environmentally sustainable operation of the proposed project, the following recommendations are made:

### A. Wastewater Management Recommendations

- The proposed **150 m<sup>3</sup>/day ETP** shall be designed, installed, operated, and maintained properly.
- Separate treatment arrangements shall be maintained for industrial and domestic wastewater.
- The proposed **ZLD-oriented reuse system** should be implemented and optimized.
- Regular monitoring of wastewater parameters shall be conducted, including:
  - pH
  - BOD
  - COD
  - TSS
  - Chromium
  - Oil & Grease
- No untreated wastewater discharge shall be permitted.

### B. Air Pollution Management Recommendations

- Adequate air pollution control systems shall be installed for process operations.
- Spray drying systems should be equipped with **dust collection/bag filter systems**.
- Proper stack height shall be maintained for generators and combustion units.
- Raw material storage and handling practices shall be controlled to minimize odor and dust generation.
- Periodic air quality monitoring should be conducted.

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## **C. Solid Waste Management Recommendations**

- A formal **Solid Waste Management Plan** should be implemented.
- Waste segregation shall be maintained at source.
- ETP sludge, chemical residues, and process waste shall be handled through safe management procedures.
- Authorized disposal arrangements shall be maintained for hazardous or regulated waste streams.
- Record keeping of waste generation and disposal should be maintained.

## **D. Occupational Health and Safety Recommendations**

- Comprehensive occupational health and safety procedures should be implemented.
- Workers shall receive regular training regarding:
  - Chemical handling
  - Emergency response
  - PPE usage
  - Operational safety
- Appropriate PPE shall be supplied and enforced.
- Fire protection and emergency preparedness measures should remain operational.

## **E. Environmental Monitoring Recommendations**

A structured environmental monitoring program should be maintained covering:

- Wastewater quality.
- Air emissions.
- Noise levels.
- Waste management performance.
- Occupational health and safety indicators.
- Environmental compliance reporting.

Periodic internal audits and corrective actions should be implemented.

## **F. Cumulative Environmental Management Recommendations**

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Considering the presence of the **existing gelatin manufacturing facility within the same industrial boundary**, cumulative environmental management should be strengthened through:

- Coordinated housekeeping practices.
- Environmental monitoring coordination.
- Utility and drainage management.
- Pollution prevention coordination.
- Periodic environmental performance review.

## G. Public Consultation and EIA Updating Recommendations

The present report is being prepared as a **draft EIA for submission and review**.

Following submission, a **public consultation program** should be conducted in accordance with **Department of Environment (DoE) requirements**.

Feedback, stakeholder observations, and community recommendations obtained through the consultation process should be incorporated into the updated and finalized EIA report.

## H. Regulatory Compliance Recommendations

The project proponent should ensure continued compliance with:

- Environmental Conservation Act and Rules.
- Department of Environment (DoE) requirements.
- Occupational safety regulations.
- Applicable wastewater, air emission, and waste management standards.

Environmental records, monitoring data, and compliance documentation should be maintained systematically.

## 8.2 Final Statement

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The proposed **Yongli Biotechnology Co. Ltd. – Industrial Protein Powder from Tannery Waste Project** demonstrates a resource recovery and value-addition approach through utilization of **tannery leather waste for industrial protein powder production**.

Considering:

- Existing industrial compatibility.
- Environmental safeguards.
- Pollution control infrastructure.
- Water reuse and ZLD-oriented management.

## Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

- Waste management framework.
- Environmental monitoring and compliance measures.

the project is considered **technically feasible, environmentally manageable, and suitable for implementation**, subject to fulfillment of the proposed mitigation measures, monitoring commitments, and applicable regulatory requirements

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# Environmental Impact Assessment (EIA) of Yongli Biotechnology Co. Ltd. (Industrial Protein Power from Tannery Waste)

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