

AT HOLDING NO. 121/1, BLOCK –H, WORD NO-07, BERAIDERCHALA, SREEPUR, GAZIPUR, BANGLADESH



PREPARED BY



Global Sustainable Certification Services Ltd. (GSCS)

House No. 75 (4th Floor), Road No. 19, Sector 11, Uttara, Dhaka 1230, Bangladesh

M: +088 01712041641 & +088 01723628840 E: a.mottaleb@gscsbd.com

W: www.gscsbd.com

June - 2018

PREFACE

Bangladesh is one of the emerging economies countries of the World and has witnessed rapid industrial growth over the last two decades that has contributed significantly to the rise in the country's Gross Domestic Product (GDP). At the same time, it also needs to be noted that Bangladesh is vulnerable to risks related to environmental pollution and climate change impacts (in the form of natural disasters like floods, cyclones) that are enhanced by man-made activities. Some of the common Environmental & Social concerns include converting paddy fields into industrial land, filling of water bodies for other purposes, encroaching into forest lands, pollution that need to be discouraged for the sake of environmental and social sustainability of the country. All these issues have significant adverse impacts on human health and flora and fauna.

Environmental and Social Impact Assessment (ESIA) is a guiding document for set-up a project in any selected location. The Environmental and Social study is conducted to address suitability of the location for the project. According to Environmental Conservation Act' 1995 and subsequent amendments; ESIA is a Legal Obligation for getting environmental clearance from a Red category project under Environmental Conservation Rules' 1997 and subsequent amendments because according to ECR, 1997, a composite industry has been categorized as Red. In light of ESSF, IDCOL the intervention in relevant to installing sewing machine, boiler and energy management system, seems to be a **Low Risk** contribution. Similarly, Environmental and Social Guidelines of JICA, has concluded the intervention as **C category**.

ESIA of the **Tosrifa Industries Limited (TIL)** is such kind of activity which points out the potential key impacts, management and relevant mitigation measures. The project office and site visit, stakeholder consultation, survey is the main source of project related data for this study.

Global Sustainable Certification Services Ltd. (GSCS) are grateful to the project authority of Tosrifa Industries Limited and others officials to support our team in every step of doing the study. Great appreciation from our side goes to respective stakeholders. Finally the contribution of team member is highly acknowledged.

With Regards,



Md. Alim Miah

Technical Manager and Team Leader

Global Sustainable Certification Services Ltd. (GSCS)

Email: alimbau31@gmail.com

March, 2018

Dhaka, Bangladesh

TABLE OF CONTENTS

Title

Preface
Table of contents
List of Abbreviation & Glossary
Executive Summary

CHAPTER 1: INTRODUCTION

1.0 Introduction
1.1 Background
1.2 Brief Description of the project
1.3 Objectives of the Study
1.3 Consistency with DoE Guidelines
1.4 Consistency with World Bank Safeguard Policy/Guidelines
1.6 Consistency with Bangladesh Bank Guidelines
1.7 Scope of present study
1.8 Tosrifa Industries Limited Commitments
 1.8.1 Tosrifa Industries Limited Social Commitment
 1.8.2 Tosrifa Industries Limited Environmental Commitments
1.9 Methodology
1.10 Report Structure
1.11 ESIA Study Team

CHAPTER 2: POLICIES AND LEGISLATION

CHAPTER 3: THE PROJECT DESCRIPTION

3.1 Project Overview
3.2 Type of Project and Capacity
 3.2.1 Project Activities
 3.2.2 Project Capacity
 3.2.2.1 List and Quantity of Raw materials Used (Input)
 3.2.2.2 List and Quantity of finished product (Output)
3.3 Project Location and Description of the site
 3.3.1 Land Ownership Detail
 3.3.2 Surroundings and Accessibility
3.4 Plant Layout
3.5 Present Status of the project
3.6 ETP and Other Treatment Plants
 3.6.1 General Information about ETP
 3.6.2 Inlet & Outlet Characteristics
 3.6.3 Desire Outlet Treated Wastewater Characteristics
 3.6.4 Sludge Management Process of TIL
3.7 Lists of Machinery
3.8 Human Resource Development

CHAPTER 4: BASELINE INFORMATION OF ENVIRONMENT

4.0. General Consideration

4.1 Project Boundary

4.2 Physico- Chemical Environments

4.2.1 Geology and Land

4.2.2 Land use and Soil Composition

4.2.3 Meteorology

4.2.4 Water Quality

4.2.4.1 Surface Water Quality

4.2.4.2 Groundwater Quality

4.2.5 Air Quality

4.2.6 Air Temperature and Humidity

4.2.6.1 Tested Air Temperature and Humidity

4.2.7 Noise Quality

4.2.8 Soil Quality

4.2.9 Solid Waste

4.2.10 Seismicity

4.3 Biological Environment

4.3.1 Background

4.3.2 Ecological and Conservation Designations

4.3.2.1 Overview

4.3.2.2 National Parks

4.3.2.3 Wildlife Sanctuaries

4.3.2.4 Game Reserves

4.3.2.5 Private Game Reserves

4.3.2.6 Reserve Forest

4.3.2.7 Other Designations

4.3.2.8 Ecological and Conservation Designations in the Project Area

4.4 Terrestrial Ecology

4.4.1 Terrestrial Flora

4.4.2 Terrestrial Fauna

4.5 Socio Economic Condition

4.5.1 Population and Social Structure

4.5.2 Living and Cultural Condition

4.5.3 Agriculture

4.5.4 Public Health

4.5.5 Industry and Commerce

4.5.6 Archeological Heritage

4.5.7 Life Pattern

4.6 Social Safeguard

5.7 Working Conditions of Labor

CHAPTER 5: PUBLIC CONSULTATION

CHAPTER 6: IDENTIFICATION, PREDICTION, EVALUATION OF POTENTIAL IMPACT AND MITIGATION

6.1 General Consideration

6.2 Scoping of Impacts

6.2.1 Checklist of Potential Impact

6.3 Environmental Impacts Identification and Mitigation Measures

6.4 Evaluation of Predicted Adverse Impacts & Mitigation Measures

6.4.1 Impact due to Project Location

6.4.2 Potential Impacts during Construction phase

6.4.2.1 Air pollution Impact

6.4.2.2 Noise and vibration

6.4.2.3 Solid and Liquid waste generation

6.4.2.4 Employment

6.4.2.5 Accident/exposure to health hazard

6.4.3 Potential Impact during operational activities

6.4.3.1 Air pollution

6.4.3.2 Noise pollution

6.4.3.3 Water pollution

6.4.3.4 Impact due to Solid Waste Generation

6.4.3.5 Impacts on Health and Safety, Natural & Accidental Incidents

6.4.4 Impact on Indigenous People

6.4.5 Impact Due to Land Acquisition

6.4.6 Ecological Impact

6.4.7 Impact due to Labor Influx

6.4.8 Positive impact of the proposed project

CHAPTER 7: ENVIRONMENTAL MANAGEMENT PLAN

7.1 General Consideration

7.2 Overview of the Project

7.3 Environmental Impact Management Action Plan

7.4 Environmental Monitoring Programmers

7.4.1 Monitoring Requirement

7.4.2 Monitoring Indicators

7.4.3 Monitoring Parameters

7.5 Environment and Social Management Plan (ESMP)

7.6 Environmental Monitoring Cost

7.7 Institutional Arrangement

7.8 Information and disclosure

7.9 Statement of Grievance Redress Policy, Procedure and Mechanism

7.9.1 Internal Grievance Mechanism

7.9.2 External Grievance Mechanism

CHAPTER 8: RISK ASSESSMENT AND DISASTER MANAGEMENT PLAN

8.0 General Consideration

8.1 Hazard categorization and potential hazard points

8.2 Consequence analysis

- 8.3 Hazard and Risk Management Plan
- 8.4 Emergency Response and Disaster Management Plan
- 8.5 Six Steps in emergency response
- 8.6 Emergency procedures in case of fire
 - 8.6.1 Fire Extinguishment and Confinement
 - 8.6.2 Portable extinguisher Instructions
- 8.7. Types of Fire
- 8.8 Fire Safety Risk Assessment
- 8.9 Managing Fire Safety
- 8.10 Safety training
- 8.11 Environmental safety management team
- 8.12 Disaster Management Plan
- 8.13 Environmental Health and Safety (EHS)

CHAPTER 9: CONCLUSIONS AND RECOMMENDATIONS

- 9.1 Conclusions
- 9.2 Recommendations

CHAPTER 10: REFERENCES

CHAPTER 11: ANNEXURE

LIST OF TABLES

Sl. NO.	Title of the Tables
3.1	General Information of the Project
3.2	Table shows the Overview of Gazipur District
3.3	Total Plant Layout description of Tosrifa Industries Limited Project
4.1	Monthly Averages of Climatic Variables at the Dhaka BMD Station, 2001-2013
4.2	Analysis of surface water Samples collected from different locations inside the study areas.
4.3	Summary of ground water Quality in the study area
4.4	Average Ambient Air Quality inside the project area
4.5	Monthly maximum and minimum temperature near the Project area 2000-2012
4.6	Show the Temperature and Humidity level Measurement inside the project area.
4.7	Show the Noise Level Assessment inside the project area.
4.8	Soil Test report of Tosrifa Industries Limited
4.9	Some Floral Species in the study area
4.10	Faunal Species in the project study areas
4.11	Fish species in the project area
4.12	Layout description of Tosrifa Industries Limited Project
6.1	Checklist of Potential Impacts
6.2	Summary Matrix of Predicted Impacts and Mitigation Measures during construction and operation
7.1	Environmental Management Action plan for Construction Phases
7.2	Environmental Management Action plan for Operational Phases
7.3	Environmental and Social Monitoring Plan (ESMP) during Project construction
7.4	Environmental and Social Monitoring Plan (ESMP) during Project operation
7.5	Environmental Monitoring Cost
8.1	Potential hazard points possessed in proposed project
8.2	Hazard assessment for the proposed project

LIST OF FIGURES

Sl. NO.	Title of the Figures
2.1	Process of Getting Environmental Clearance Certificate (ECC)
3.1	Location Map of Gazipur District including project site
3.2	Sreepur Upazila and Project Site
3.3	Tosrifa Industries Limited Project Site
3.4	Project Master Layout Plan
3.5	Present condition of the project
3.6	Biological Effluent Treatment Plant (ETP) of Tosrifa Industries Limited a) Process diagram b) Line diagram of ETP of TIL.
3.7	Machinery lists of Tosrifa Industries Limited
4.1	Tosrifa Industries Limited around project site (East, West, North & South)
4.2	Location of the TIL project site on the Groundwater Zoning Map 2010 of Bangladesh
4.3	Ambient Air Quality Sampling
4.4	Temperature and Humidity Level Assessment during field visit
4.5	Noise Level Assessment during field visit
4.6	Solid Waste Management of Tosrifa Industries Limited during construction
4.7	Earth quake Zone of Bangladesh
4.8	Floral and Faunal composition in the study area
5.1	Public consultation with local people around the project area
5.2	Stakeholder Consultations with local people, Teacher, UP Member and Upazila Level Government Officers
8.1	Different parts of portable extinguisher
8.2	Fire Safety Equipment
8.3	Flow Diagram of Planning and management Fire Safety System

LIST OF ANNEXURE

- Annexure I: Environmental Standard
- Annexure II: Production Process Flow Diagram of Tosrifa Industries Limited
- Annexure III: Land owner Documents
- Annexure IV: Master Plan of the Project including Drainage network for Storm Water Management and Septic Tank Location and Septic Tank Outlet and ETP out let connection.
- Annexure V: Site Clearance Certificate of Tosrifa Industries Limited from DOE
- Annexure VI: NOC from Sreepur pourashava
- Annexure VII: NOC from Bangladesh Electrification Board
- Annexure VIII: NOC from Titas Gas
- Annexure IX: Flow Meter Location & Flow Meter arrangement (Type and Specification)
- Annexure X: Generators & Boilers arrangement and Specifications
- Annexure XI: Specification of ETP components of Tosrifa Industries Limited
- Annexure XII: ETP Design Calculation of Tosrifa Industries Limited
- Annexure XIII: Combine Drainage Layout plan and out let connection- ETP out let arrangement and flow meter location, Storm Water drainage of the factory showing arrow & Septic Tank location and their out let connection of Tosrifa Industries Limited
- Annexure XIV: Surface Water Test Report
- Annexure XV: Ground Water Test Report
- Annexure XVI: Ambient Air Quality Test Report
- Annexure XVII: Temperature and Humidity Level Test Report
- Annexure XVIII: Noise Level Test Report
- Annexure XIX: Soil Test Report
- Annexure XX: List of Stakeholders, Their Name, Profession, and Problem/Comments
- Annexure XXI: Attended Sheet of Stakeholders Consultation/ Discussion and Upazila Level Officers
- Annexure XXII: Public Survey Form
- Annexure XXIII: Some Picture of the ESIA Study and Monitoring
- Annexure XXIV: Company Organogram with Environmental Responsible Personnel
- Annexure XXV: The Details of ESIA Team

ABBREVIATIONS

1. BB	-	Bangladesh Bank
2. BBS	-	Bangladesh Bureau of Statistics
3. BMD	-	Bangladesh Meteorological Department
4. BNBC	-	Bangladesh National Building Code
5. CO	-	Carbon Monoxide
6. DAP	-	Detailed Area Plan
7. DMDP	-	Dhaka Metropolitan Development Plan
8. DoE	-	Department of Environment
9. ECA	-	Environmental Conservation Act
10. ECC	-	Environmental Clearance Certificate
11. ECR	-	Environmental Conservation Rules
12. EHSMS	-	Environmental, Health and Safety Management System
13. EMP	-	Environmental Management Plan
14. EQS	-	Environmental Quality Standards
15. ESIA	-	Environmental & Social Impact Assessment
16. FGD	-	Focus Group Discussions
17. GDP	-	Gross Domestic Product
18. GLCs	-	Ground Level Concentrations
19. GoB	-	Government of Bangladesh
20. IEE	-	Initial Environmental Examination
21. IFC	-	International Finance Corporation
22. ISO	-	International Organization for Standardization
23. MoEF	-	Ministry of Environment and Forest
24. NEMAP	-	National Environmental Management Action Plan
25. NOC	-	No Objection Certification
26. NOx	-	Oxides of Nitrogen
27. PPE	-	Personal Protective Equipments
28. RAJUK	-	Rajdhani Unnayan Kartripakhha
29. SEI	-	Significant Environmental Impacts
30. SOx	-	Oxide of Sulfur
31. TFL	-	Tosrifa Industries Limited
32. WB	-	World Bank

GLOSSARY

Air pollution: Air is made up of a number of gases, mostly nitrogen and oxygen and, in smaller amounts, water vapour, carbon dioxide and argon and other trace gases. Air pollution occurs when harmful chemicals and particles are emitted to the air – due to human activity or natural forces – at a concentration that interferes with human health or welfare or that harms the environment in other ways.

Air quality: A measure of the level of pollution in the air.

Biodiversity: A short form of the phrase ‘biological diversity’, which means the variety of life on this planet and how it interacts within habitats and ecosystems. Biodiversity covers all plants, animals and micro-organisms on land and in water. See also ecosystem, habitat and organism.

CFCs: Short for ‘Chlorofluorocarbons’, which are chemicals used in manufacturing and, in the past, in aerosol cans and refrigerators, which can damage the ozone layer.

Environment: That which surrounds.

Environmental change: A natural or man-induced alteration in the environment.

Environmental criteria: Summaries and syntheses of existing relevant information on physical, biological, sociological, and economic responses to environmental stresses.

Environmental effect: A man-induced environmental change.

Environmental impact: A change in environmental quality (the word 'impact' implies that a value judgment has been made on the importance of an environmental effect or change).

Environmental impact assessment: An activity designed to identify and predict the impact on the bio-geophysical environment and on man's health and well-being of legislative proposals, policies, programs, projects, and operational procedures, and to interpret and communicate information about the impacts.

Environmental Impact Statement: A term defined formally in the United States National Environment Policy Act as a summary of the environmental impact of an action and alternatives, including the non-action state.

Environmental quality: The state of the environment as perceived objectively in terms of measurements of its components, or subjectively in terms of its attributes such as beauty and worth.

Environmental standards: Limiting conditions of environmental quality, often expressed in numerical terms and usually with legal standing, that have been set by a jurisdiction to protect man's health and well-being.

Environmental Management System (EMS): An Environmental Management System (EMS) is a framework that helps a company achieves its environmental goals through consistent control of its operations. The assumption is that this increased control will improve the environmental performance of the company. The EMS itself does not dictate a level of environmental

performance that must be achieved; each company's EMS is tailored to the company's business and goals.

Effluent: Liquid wastes such as sewage and liquid waste from industries.

Greenhouse gases: Gases such as carbon dioxide and methane, which tend to trap heat radiating from the Earth's surface, so causing warming in the lower atmosphere. The major greenhouse gases that cause climate change are carbon dioxide (CO₂), methane (CH₄) and nitrous oxide (NO₂). See also greenhouse effect and global warming.

Hazardous waste: Waste that poses a risk to human health or the environment and needs to be handled and disposed of carefully. Examples include oil-based paints, car batteries, weed killers, bleach and waste electrical and electronic devices.

Particulate matter: Fine solid or liquid particles that pollute the air and are added to the atmosphere by natural and man-made processes at the Earth's surface. Examples of particulate matter include dust, smoke, soot, pollen and soil particles.

Noise pollution: Noises that disturb the environment and people's ability to enjoy it, for example continually sounding house alarms, loud music, air conditioning or other electrical units and aircraft or motor engines.

Recycle: To break waste items down into their raw materials, which are then used to re-make the original item or make new items.

Sewage: Liquid wastes from communities, which may be a mixture of domestic effluent from homes and liquid waste from industry.

Smog: Air pollution consisting of smoke and fog, which occurs in large urban and industrial areas and is mainly caused by the action of sunlight on burned fuels, mostly from car exhausts. Smog can cause eye irritations and breathing problems and damage plant life.

Social Impact Assessment: It includes the processes of analyzing, monitoring and managing the intended and unintended social consequences, both positive and negative, of planned interventions (policies, programs, plans, projects) and any social change processes invoked by those interventions.

Waste management: The management of waste collection, handling, processing, storage and transport from where it is produced to where it is finally disposed. See waste prevention.

Waste prevention: An aspect of waste management that involves reducing the amount of waste we produce and minimizing the potential harm to human health or the environment from packaging or ingredients in products.

Zero emissions: An engine, motor or other energy source that does not produce any gas or release any harmful gases directly into the environment.

EXECUTIVE SUMMARY

Tosrifa Industries Limited (TIL) is setting-up a dyeing unit with knitting facility of total 28 MT per day. The project is located at holding no. 121/1, Block –H, Word no-07, Beraiderchala, Sreepur, Gazipur, Bangladesh.

As per environmental Conservation Rules 1997 (amended 2002), a composite industry is scheduled under **“Red category”**. So an Environmental & Social Impact Assessment (ESIA) has been carried out for this project as per requirement of the World Bank fund to be disbursed by Bangladesh Bank. The Global Sustainable Certification Services Ltd. (GSCS) has commissioned to conduct the ESIA study of the project. In light of ESSF, IDCOL the intervention in relevant to installing sewing machine, boiler and energy management system, seems to be a **Low Risk** contribution. Similarly, Environmental and Social Guidelines of JICA, has concluded the intervention as **C category**.

Baseline condition

Tosrifa Industries Limited, a sister concern of Northern Tosrifa Group is setting-up a Dyeing Project at holding no. 121/1, Block –H, Word no-07, Beraiderchala, Sreepur, Gazipur, Bangladesh. After implementing the full project TIL can employ more than 500 well compensated workers in an excellent working environment provided with meals, medical facility as well as child care facility. In this Fabric dyeing project total land area is about 1,256.55 decimal and after implementing the full project per day dyeing production capacity will be 28 MT. The project area has situated at Sreepur Upazila of Gazipur District. The GPS Location of the project site is 24°11' 41.30' N & 90°24' 48.89' E.

Baseline Environment Survey

The ESIA primarily comprises of a detailed baseline analysis through measurements of different environmental parameters like air quality, noise level and the quality of ground and surface water in the vicinity of the project site. A baseline survey (including physical, ecological surveys) was conducted during August-October 2017 covering areas in and around the project site (i.e., the study area), in order to update information on “baseline” environment. Informal discussions were held with people living and working in the surrounding areas. The purpose of the baseline survey was to document the existing conditions of physical and biological environment and prevailing socio-economic conditions of the project areas. During field visits, discussions were held with the TIL officials and engineers on different issues relevant to project, capacity and institutional arrangements for environmental management of the proposed project.

Public Consultation

Public Consultation held at project locations, which were participated by a wide range of stakeholders. The participants expressed their opinions regarding different issues including their knowledge about the proposed dyeing project, socio-economic condition of people in their localities, possible impacts of the proposed project on the existing environment and in

their localities, and mitigation measures to address adverse impacts. In addition, public consultations (in the form of informal discussion) were also carried out during field visits.

Environmental and Social Impact Evaluation

As a part of the Environmental and Social Impact Assessment (ESIA), environmental impacts of the specific project activities on different ecological, physical, chemical and socio-economic related parameters, both during the construction phase and the operation phase, have been identified and assessed.

Ecological impact

Based on assessment of the baseline environment at different project locations (during field visits) and the nature and scale of the proposed project, it appears that ecological impacts are not likely to be significant.

Socio-economic impacts

Possible socio-economic impacts from the project activities to be carried out may include the following: (a) traffic safety (b) public health and (c) generation of employment and commercial activities.

Physical and chemical impacts

Possible physical and chemical impacts from the project activities to be carried out may include the following: (a) Noise pollution, (b) Air pollution (c) Environmental pollution from solid/construction waste.

Environmental and Social Management Plan

Environmental Management Plan (ESMP) has been prepared for construction and operation phase which comprise mitigation measures plan for minimizing the negative impacts and enhancement plan for increasing the benefits of the positive impacts.

Disclosure

As per World Bank's policy on access to information, Tosrifa Industries Limited will make the ESIA document available to the public by publishing it in their websites. In addition, hard copies of these documents in English will be made available in publicly accessible locations in the project site as well as in the head office of Tosrifa Industries Limited.

CHAPTER – 1 INTRODUCTION

1.0 INTRODUCTION

1.1 Background

Tosrifa Industries Limited (TIL) is establishing an Eco friendly dyeing unit (Green Project) with capacity of total 28 MT per day. Presently TIL is depending on others for its fabric dyeing; with the installation its own dyeing unit the company can reduce these expenses and also its shipment lead time. It will be a source of employment thus socio-economic development will be an outcome of the project. It will follow environment friendly manufacturing process having minimal emission, noise, water pollution & proper health and safety management of the worker, Medical and Child Care Facility of the worker.

To set-up the unit, TIL has imported machineries from Europe, Turkey and Japan. The dyeing unit is equipped with energy efficient machines and are considered one of best in the world.

The total cost of the project is estimated to be USD 27.37 million – in 1st phase USD 20.56 million for set-up dyeing facility of 15 MT per day, in 2nd phase USD 6.81 million for set-up dyeing facility of 13 MT per day with knitting factory building. The plant will run by technical experts and industry professionals ensuring highest quality products. One of the key aspects that the management is focused on Eco Friendly (Green Project). The choice of machinery and the factory design has been made with careful consideration of reducing carbon foot print. The location was selected with considering availability electricity & gas, economical labor and communication facilities.

The project is established on land area of 1,256.55 decimal where 437.87 decimal owned by TIL and 818.68 decimal taken leased from Northern Knit Limited (NKL) for 25 years. NKL is a sister concern of TIL under common directorship. The lands were purchased from willing sellers at market values over the period from 2005 to 2016. As there is no land acquisition and community impact, resettlement, livelihood, income of the local people will not be negatively affected by implementing the project, so project will not trigger World Bank OP-4.12. In this area no tribal and indigenous people will be affected by the project operation, So World Bank OP-4.10 will not be triggered as well.

1.2 Brief Description of the project

TIL is setting-up a dyeing unit with knitting facility which will be LEED certified. The state of the art dyeing unit has a capacity of total 28 MT per day completed through **2 (two) phases**.

1st Phase: The construction and machinery set-up of 1st phase for dyeing capacity with 15 MT per day has been completed and the commercial operation of 1st phase started from 30 November 2017.

2nd Phase: In 2nd phase there will have another dyeing capacity of 13 MT per day with a knitting factory building and the required civil works and machinery set-up of 2nd phase is under process.

1.3 Objectives of ESIA study

The ESIA is a formal process to examine and determine the Environmental and Social consequences of a proposed major development. The ESIA examines problems, conflicts and natural resources constraints that could affect the viability of the project. It investigates how the project might harm or benefit for the people in relation to their households or livelihoods. It also provides important feedback into the design to minimize negative impacts and enhance positive ones.

The objectives are to ensure that the activities undertaken in the project:

- Enhance positive environmental and social outcomes
- Prevent negative environmental and social impacts
- Identify and mitigate with appropriate measures, the adverse impacts that might arise
- Ensure compliance with the World Bank's environmental and social safeguards policies.

1.4 Consistency with DoE Guidelines

Environmental Conservation Act 1995 is presently the main legislative article relation to environmental protection and conservation in Bangladesh. Under this act no industrial unit or project shall be established or adopted without obtaining ECC. In the manner prescribed by the rules, from the DG; Compliance with the provision of this act is the liability of DoE. A set of significant rules to execute the ECA has recently been promulgated in 1997.

The rules incorporate inclusion lists of project requiring varying degree of environmental research e.g.- the entire new project under red category generally will require two steps assessment process firstly IEE for site clearance and secondly a full environmental Impact Assessment (ESIA for Technical Clearance).

1.5 Consistency with World Bank Safeguard Policy/Guidelines

WB Safeguard policies, incorporating environmental and social principles, are designed to protect the interests of the various stakeholders from adverse impacts of World Bank-assisted projects. The effectiveness and development impact of projects and programs supported by the Bank has substantially increased as a result of attention to these policies. The objective of these policies is to prevent and mitigate undue harm to people and their environment in the development process. The Safeguards are designed to protect the environment from possible adverse effects of its projects. The effectiveness and development impact of projects and programs supported by the Bank has substantially increased as a result of attention to these policies. The World Bank has some environmental, social, and legal safeguard policies.

1.6 Consistency with Bangladesh Bank Guidelines

As per Bangladesh Bank Guidelines - an E&S Management System is a set of policies, procedures, tools and internal capacity to identify, monitor and manage a Bank/FI's exposure to the E&S risks of its clients. An E&S Management System states a Bank/FI's commitment to E&S management, explains its procedures for identifying, assessing and managing E&S risk of financial transactions, defines the decision-making process, describes the roles, responsibilities and capacity needs of staff in doing so and states the documentation and recordkeeping requirements. It also provides guidance on how to screen transactions, categorize transactions based on their E&S risk, conduct E&S due diligence and monitor the client's E&S performance.

The ESMS includes the financial institution's environmental and social policy and designated roles and responsibilities of its staff.

1.7 Scope of present study

This Environmental and Social Impact Assessment (ESIA) is a part of the environmentally and socially sound study for the existing TIL project. The objective of the study is to assess the current environmental condition of the project and helps to make an Environmental and Social Monitoring Plan (ESMP) to achieve their "Environmental" and "Social" vision. The study is to verify the impact of the existing project on environment and on social. The ESIA study of the project has been identified the potential environmental impacts/issues and also provides outline of suggestions of effective measures to mitigate the adverse impact and enhance the positive environmental potential.

1.8 Tosrifa Industries Limited Commitments

Tosrifa Industries Limited understands its responsibilities towards the society, human resource and environment. Hence, we ensure conservation of resources as per the prescribed laws and regulations as per the (ISO: 14001) environment management system. From social point of view, TIL will assure an Ethical & responsible environment for our employees & our society, by adhering Government Legislations & Customer COC's & other recommendations govern by other parties. TIL will also deliver the social economic benefits to employees & our dependents to uplift their livelihood.

1.9 Methodology

A team of multidisciplinary specialists has been employed to prepare the ESIA Report. Both secondary and primary data were used in the preparation of the ESIA Report. The ESIA study has been conducted and the present report prepared based on the information provided by Tosrifa Industries Limited as well as all possible secondary information and data collected from all relevant sources and from the field through observation, primary data collection, stakeholder's consultation, survey and certain degree of field validation.

During this process, the following steps have been followed

- ❖ Review of literature and identify areas to focus in the study.
- ❖ Collect information from project area related to study.
- ❖ Detail understanding of scope of assignment, activities involved and the intervention areas and its surrounding environment.
- ❖ Engage resources persons/field staff for the assignment.
- ❖ Collect all possible data on the environmental, social, health and natural resource components and parameters of necessity.
- ❖ Collection and review of pertinent reports and other references. This particularly included DoE EIA Guidelines for industries 1997, Environmental policies, strategies and acts.
- ❖ Collect samples, as necessary (air, water, noise) from predetermined points and areas within the study area and analyzes relevant parameters;

- ❖ Develop and utilize different information gathering tools as necessary or deemed appropriate.
- ❖ Critical analysis of proposed project documents and others information.
- ❖ Identification of source of environmental and biodiversity degradation and disturbance of significance.
- ❖ Identification of Potential Environmental Impacts
- ❖ Presentation of an outline of environmental management plan for future handle the environmental, biological, Social and health related issues.
- ❖ Formulate Environmental Monitoring Plan
- ❖ Preparation of Draft ESIA report
- ❖ Review of the report by experience reviewer
- ❖ Prepare final ESIA report and submit to the concern authority.

In the process of preparing the ESIA, ESIA Guidelines of World Bank for Textile industries have been specially consulted and considered.

1.10 Report Structure

The Report is being prepared in meeting with the requirements of TIL as well as the Bangladesh Bank/World Bank Standard/ DoE Standard. The outline of the report structure is given below:

- ❖ Chapter-1 presents the “Introduction” which will deal with the “background” and other aspects of the study.
- ❖ Chapter-2 covers the “Policies and legislation” applicable to developments of this type of project in Bangladesh. It describes briefly the Regulatory Framework, Environmental Policy, Energy and Power Policies, Environmental standards, Environmental Clearance Requirements, World Bank Social and safeguard policies and World bank-IFC Environment, Health and safety guidelines.
- ❖ Chapter-3 describes the “Description of the Project”.
- ❖ Chapter-4 covers the “Baseline Information of Environment”.
- ❖ Chapter-5 describes “ Public Consultation’s”
- ❖ Chapter-6 describes the “ Identification, Prediction, Evaluation of potential Impacts and Mitigation measures”
- ❖ Chapter-7 describe the “ Environmental Management Plan”
- ❖ Chapter-8 describe the “Risk Management and Disaster Management Plan
- ❖ Chapter- 9 describe the “Conclusions and Recommendations”
- ❖ Chapter- 10 deals with “References”
- ❖ Chapter – 11 deals with “Annexure”

1.11 ESIA Study Team

The Present ESIA study has been conducted by the Environmental consulting firm named Global Sustainable Certification Services Limited (GSCS). The ESIA team consists of multidisciplinary experts. The details of the ESIA Team members are described in Annexure: XXV.

CHAPTER -2

POLICIES AND LEGISLATION

Environmental Standard

The standards, commonly known as Environmental Quality Standards (EQS), are legally binding. There is a separate schedule on industry specific standards, other than the general industrial emission and effluent standards.

For reference, the Bangladesh standards for ambient air, noise, industrial effluent and industrial emission are furnished hereinafter as separately included in **Annexure-I**.

Industrial Policy 1992

Industrial Policy, 1991 seeks to liberate the industry from the shackles of licensing system. Drastically reduce the role of public sector and encourage foreign participation in industrial development.

National Environmental Policy, 1992

The concept of environmental protection through national efforts was first recognized and declared with the adoption of the Environmental Policy, 1992 and the Environmental Action Plan, 1992. The importance of policies in beefing up the environmental regime is recognized in a number of international instruments including the World Conservation Strategy in 1980 and the Brundtland Commission Report, 1987. Paragraph 14 of Chapter 8 of Agenda 21 underscored the necessity of formulation of national policies as well as laws for environmental protection and sustainable development.

National Conservation Strategy 1992

National Conservation Strategy 1992 was endorsed to balance a country's economic development with the conservation and use of their natural resources. This important step came none too soon, as the nation faces numerous environmental problems that constrain its efforts to meet people's needs.

National Environmental Management Plan (NEMAP), 1995

The National Environment Management Action Plan (NEMAP, 1995), based on a nationwide consultation program identified the main national environmental issues, including those related to the water sector which EA practitioners should note.

Convention, Treaties and Protocols

The Equator Principles of World Bank, 2013

The Equator Principles is a risk management framework, adopted by financial institutions, for determining, assessing and managing environmental and social risk in projects. It is primarily intended to provide a minimum standard for due diligence to support responsible risk decision-making. The Equator Principles apply globally, to all industry sectors and to four financial products 1) Project Finance Advisory Services 2) Project Finance 3) Project-Related Corporate

Loans and 4) Bridge Loans. The Equator Principles Financial Institutions (EPFIs) will only provide Project Finance and Project-Related Corporate Loans to Projects that meet the requirements of prescribed Principles.

Legal Requirement

Department of Environment, Bangladesh

According to the Bangladesh Environmental Conservation Rules'97, a composite industry is usually categorized as Red category requiring to obtain "Environmental Clearance Certificate" from Department of Environment prior to commence commercial run.

Infrastructure Development Company Ltd.

Environmental and Social Safeguards Framework (ESSF) defines a composite project as a Moderate risk project in consideration of its project specific impact. But in case of only installing some sewing machines, boiler and environmental management system, where there is no issue with significant land acquisition and land development; air, water and noise pollution, this portion of the project can be specifically concluded as a Low Risk intervention.

JICA Guidelines

In 2010, Japan International Cooperation Agency (JICA) has introduced Environmental and Social Considerations Guidelines (ESC Guidelines). It is a master document with the objectives to guide that set forth JICA's responsibilities and required procedures, together with obligations of partner countries and project proponents, in order to put ESC into practice. By running projects with appropriate ESC put into practice in accordance with the ESC Guidelines, JICA promotes inclusive and dynamic development. The ESC Guidelines, in languages including English, Chinese, French, and Spanish, as well as related documents such as Frequently Asked Questions are available on JICA's website. http://www.jica.go.jp/english/our_work/social_environmental/guideline/index.html

JICA's partners, including host countries, borrowers, and project proponents (hereinafter referred to as "project proponents etc."), bear the primary responsibility for ESC. JICA's role is to examine the ESC undertaken by the project proponents etc. in their development projects and to provide necessary support to ensure that the appropriate ESC are put into practice and that adverse impacts are avoided or minimized to an acceptable level.

ESC Guidelines have three categories of project in consideration of scale of impacts: A, B, C. Based on this categorization, it seems that installation of some sewing machines, boiler and environmental management system might be a C type project.

CHAPTER -3 THE PROJECT DESCRIPTION

3.1. Project Overview

General Information about the Project is given below:

Table 3.1: General Information of the Project

Project Name	Tosrifa Industries Limited (Fabric Division)
Type of business/operation	Fabric dyeing with knitting facility
Project Location	Holding no. 121/1, Block –H, Word no-07, Beraiderchala, Sreepur, Gazipur, Bangladesh.
Total land area	1,256.55 decimal
Production Capacity	28 MT Fabric dyeing per day
Water Source	Own Deep Tube wells
Total Water use (Per/day)	375000 L/day for all the purpose
ETP Capacity	60 m3/hr
Factory Running Time	24 hours
Energy Requirements- Electricity	4 MVA from REB

3.2 Type of the Project and Capacity

3.2.1 Project Activities

Tosrifa Industries Limited is a composite textile manufacturing project. In the composite manufacturing process has different activities like- knitting, Dyeing, Dyeing Finishing, Cutting Sewing and Finishing. The Process Flow Diagram is shown in Annexure II.

3.2.2 Project Capacity

3.2.2.1 List and quantity of raw materials used (Input)

Tosrifa Industries Limited will use some raw material for the production of knit garments product. The list of raw material are shown in below-

- | | |
|----------------|---------------------------------|
| ❖ Knit Fabrics | ❖ H ₂ O ₂ |
| ❖ Yarn | ❖ Enzyme |
| ❖ Color | ❖ Various dyes |
| ❖ Soda | ❖ Salt |
| ❖ Ash | |
| ❖ Caustic Soda | |

3.2.2.2 List and Quantity of finished product (Output)

This Composite textile industry will produce mainly Grey knit Fabrics and Finished Fabrics. After that, they will produce knit garments. The factory will produce 28MT fabrics dyeing daily

considering 24 hours production and sewing garments production capacity 19,718,400 pieces per year.

3.3 Project Location and Description of the site

Gazipur District (Dhaka division) area 1741.53 sq km, located in between 23°53' and 24°21' north latitudes and in between 90°09' and 92°39' east longitudes (Figure 3.1). It is bounded by Mymensingh and Kishorgonj Districts on the north, Dhaka, Narayanganj and Narsingdi district on the south east, Dhaka and Tangail district on the west. Population Total 2031891; male 1067722, female 964169; Muslim 1872943, Hindu 137678, Buddhist 20124, Christian 235 and others 911. Water bodies River 17, canal 84, dighi 12, beel 413, Lake 3 (artificial), jalmahal 14; main rivers Old Brahmaputra, Shitalakshya, Turag, Bangshi, Balu, Banar. Administration Gazipur District was formed in 1984.

Although there is no impact on social issue for continuation of the project as mentioned in previous chapter-1. No Indigenous people will be affected for this project construction and operation as mentioned earlier. There are some beneficial impacts of the project such as create job opportunity for local people, increase the life standard of the people around the project area.

Table 3.2: Table shows the Overview of Gazipur District

Gazipur District Overview									
Area (sq km)	Upazila	Municipality	Union	Mouza	Village	Population		Density (per sq km)	Literacy rate (%)
						Urban	Rural		
1741.5	5	4	45	768	1162	929770	1102121	1231	56.4
Others Information of District									
Name of upazila	Area (sq km)	Municipality	Union	Mouza	Village	Population	Density (per sq km)	Literacy rate (%)	
Kapasias	356.98	-	11	166	230	321454	900	56.4	
Kaliakair	314.14	1	9	181	287	267003	850	48.4	
Kaliganj	158.79	1	8	151	198	239527	1508	54.9	
Gazipur Sadar	446.38	2	8	183	261	866540	1941	62.6	
Sreepur	465.24	-	9	81	186	337367	725	47.7	

Source: Bangladesh Population Census 2011, Bangladesh Bureau of Statistics (BBS).

Tosrifa Industries Limited is located at Holding no. 121/1, Block –H, Word no-07, Beraiderchala, Sreepur, Gazipur, Bangladesh. It is at 1 hour and 32 minutes driven and 42.1 km away from Harzat Shahjalal International Airport. It is surrounded by industry, land and road. The Project will enjoy the infrastructure facilities such as electricity, telecommunication and road transport facilities. Ground Water is the main source of water of TIL. The study area for the ESIA of Tosrifa Industries Limited is shown in Figure 3.2 and 3.3.

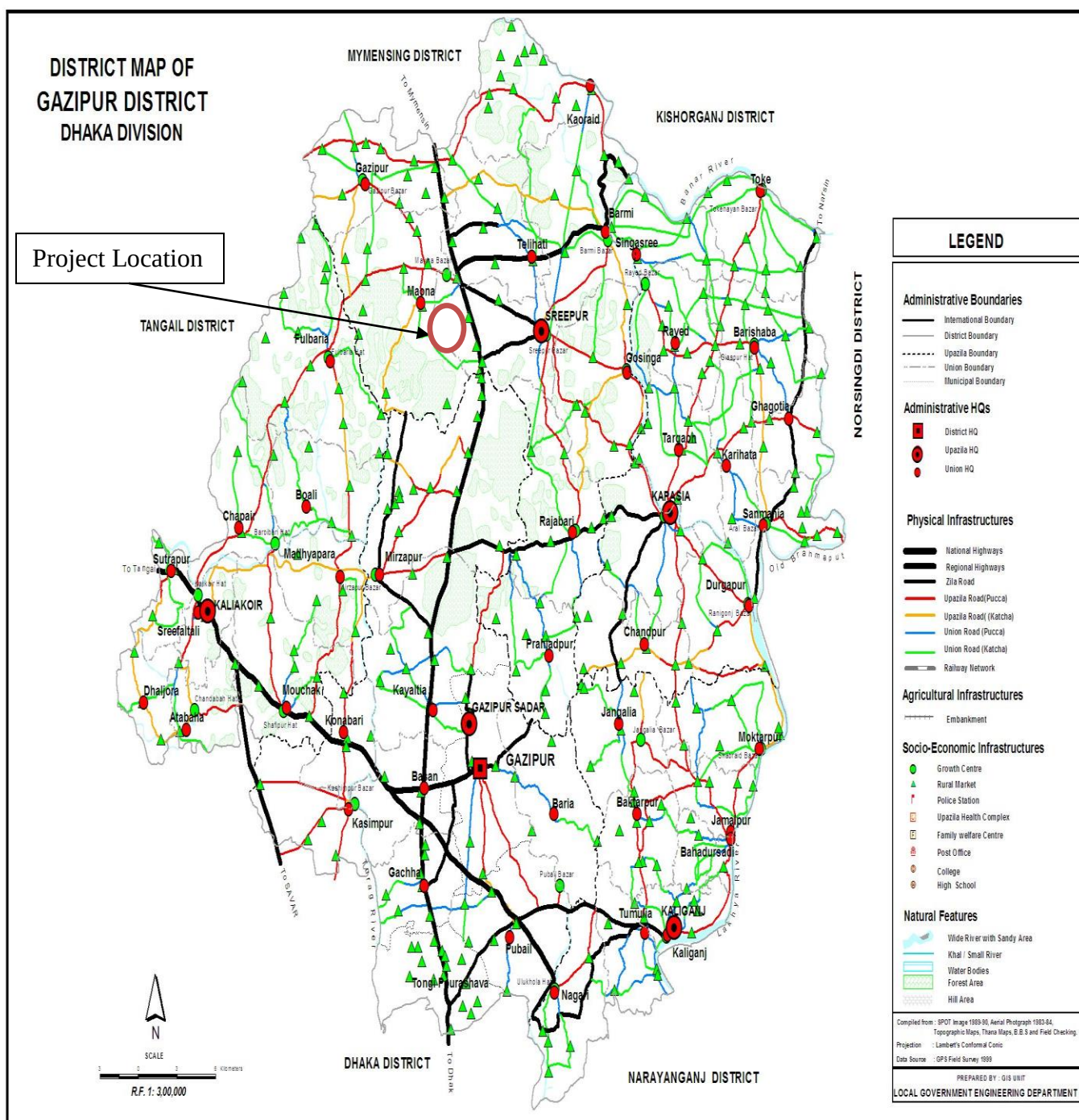


Figure 3.1: Location Map of Gazipur District including project site



Figure 3.2: Sreepur Upazila and Project Site



Figure 3.3: Tosrifa Industries Limited Project Site

3.3.1 Land Ownership Detail

TIL requires land area of 1,256.55 decimal where 437.87 decimal owned by TIL and 818.68 decimal taken leased from Northern Knit Limited (NKL) for 25 years. NKL is a sister concern of TIL under common directorship. The lands were purchased from willing sellers at market values over the period from 2005 to 2016. Land ownership documents are shown in Annexure-III.

3.3.2 Surroundings and Accessibility

It is situated in Holding no. 121/1, Block –H, Word no-07, Beraiderchala, Sreepur, Gazipur, Bangladesh. So the site is surrounded by vacant low lying area, house, Industry, road and agricultural land. The Proposed site is easily accessible by road.

The project area is situated at Sreepur Upazila of Gazipur District. The GPS Location of the project site is 24°11' 41. 30''N & 90°24' 48. 89''E. In this Project –

1. North side: Ansar Road & Aswad Composite Mills Limited (Unit-1)
2. South Side: Vacant Land and low lying area
3. East Side: 8-10 Feet wide rural road and Designtex knitwear Limited
4. West side: Vacant Land

3.4 Plant Layout

Total Land required for this factory will be 1,256.55 decimal. Total area will include production unit, admin building, Store house, training and day care centre, Substation and generator, ETP, WTP and Chemical store, Husk Boiler, Solid wastage storage area, Rainwater Harvesting area and require open spaces.

The Plant Layout are shown in below table 3.3

Table 3.3: Total Plant Layout description of Tosrifa Industries Limited Project

SI No.	Building Name	Area (Sft.)
1	Production Building	117,412
2	Utility Building	18,882
3	WTP & Chemical Store	33,318
4	ETP	14,384
5	Husk Boiler Building	16,750
6	Knitting Building	81,180
7	Yarn Store Building	23145
	Total	<u>305,071</u>

The master Layout plan of the project is shown in figure-3.4; Master plan with septic tank location and their out let connection, ETP Connection with canal and Drainage Network for storm water management of the project are shown in **Annexure IV**.



Figure 3.4: Project Master Layout Plan

3.5 Present Status of the project

This dyeing project was planned to be executed through 2 (two) phases. The present status of the project is as under:

Phases	Details	Present Status
Phase-1: Establishment of Dyeing Capacity – 15 MT per Day (Started on 15 March 2015 & Completed on 25 November 2017)	Construction and Civil Works: Production Building, Utility Building, WTP & Chemical Store, ETP, Husk Boiler Building, Warehouse, Septic Tank, Sewage and Drainage System, Internal Road Machinery Installations: Dyeing Machines For 15 MT dyeing per day, Finishing Machines, Lab Equipment, Blower for ETP, Boilers, Generators, Electrical Sub-stations, Utility Connections, Solar Panel	Commercial operation started from 30 November 2017
Phase-2: Enhancement of Dyeing Capacity of another 13 MT per day (Started in October 2017 and Continued)	Construction and Civil Works: Construction of Knitting Building, Civil Works in Production Building for installing enhanced capacity dyeing machines Machinery Installations: Dyeing Machines For 13 MT dyeing per day, Knitting Machines and Washing Machines, Lab Equipment	Knitting building construction under process, LCs opened for machinery. It is expected that the commercial operation of Phase-2 can be started by December 2018.

The project already have site clearance certificate (SCC) from DOE, NOC from Sreepur pourashava, NOC from Bangladesh Electrification board, NOC from Titas Gas Company. All this are included in Annexure-V, Annexure-VI, Annexure-VII, and Annexure –VIII. The present conditions of the factory are shown by different pictures.

TIL Project will use different flow meters in their ETP and others area of the factory for calculation of water used. The flow meter arrangements (Types and specification) are given in **Annexure-IX**.

For the continuation of the project they will use 3 generators, 1 Gas boiler, 1 Thermo oil Heater and 1 Husk Boiler. The Generator and Boiler arrangements (Types and specification) are given in **Annexure-X**.



Figure 3.5: Present condition of the project

3.6 ETP and Other Treatment Plants

Water is the most vital elements among the natural resources, and is crucial for the survival of all living organisms. The environment, economic growth and developments of Bangladesh are highly influenced by the quality of surface and ground water. The increasing urbanizations and industrializations of Bangladesh have negative implications for water quality. Considering the environment & sustainability, Tosrifa Industries Limited, Ansar Road, Beriaderchala, Sreepur, Gazipur, is going to install a Modernized Biological ETP by using “Up-flow Anaerobic Sludge Blanket (UASB) and Bio-Filtration process” and operating this ETP to comply with national and international standard of the discharged water quality. The ETP Specifications and Design calculation are included in **Annexure- XI and Annexure XII**.

3.6.1 General Information about ETP

Location	: Ansar Road, Beriaderchala, Sreepur, Gazipur
Land Area	: 25000 sft
Power Consumption	: 200 KW
Type of Effluent	: Textile Effluent
Quantity of Effluent	: 60 m ³ /Hr
Treatment Hours	: 24 Hrs/Day
Treatment Concept	: UASB and Bio-Filtration process with Aerobic Biodegradation Process.

3.6.2 Inlet & Outlet Characteristics

Expecting Inlet Wastewater Characteristics

PARAMETERS	INLET
pH	12-14
DO mg/L	0.0
BOD, mg/lit.	200-600
COD, mg/lit.	500-1200
Total Suspended Solids (TSS), mg/lit	200-450
TDS	2000-4000
Oil and Grease, mg/lit	25-60
Color	Black

3.6.3 Desire Outlet Treated Wastewater Characteristics

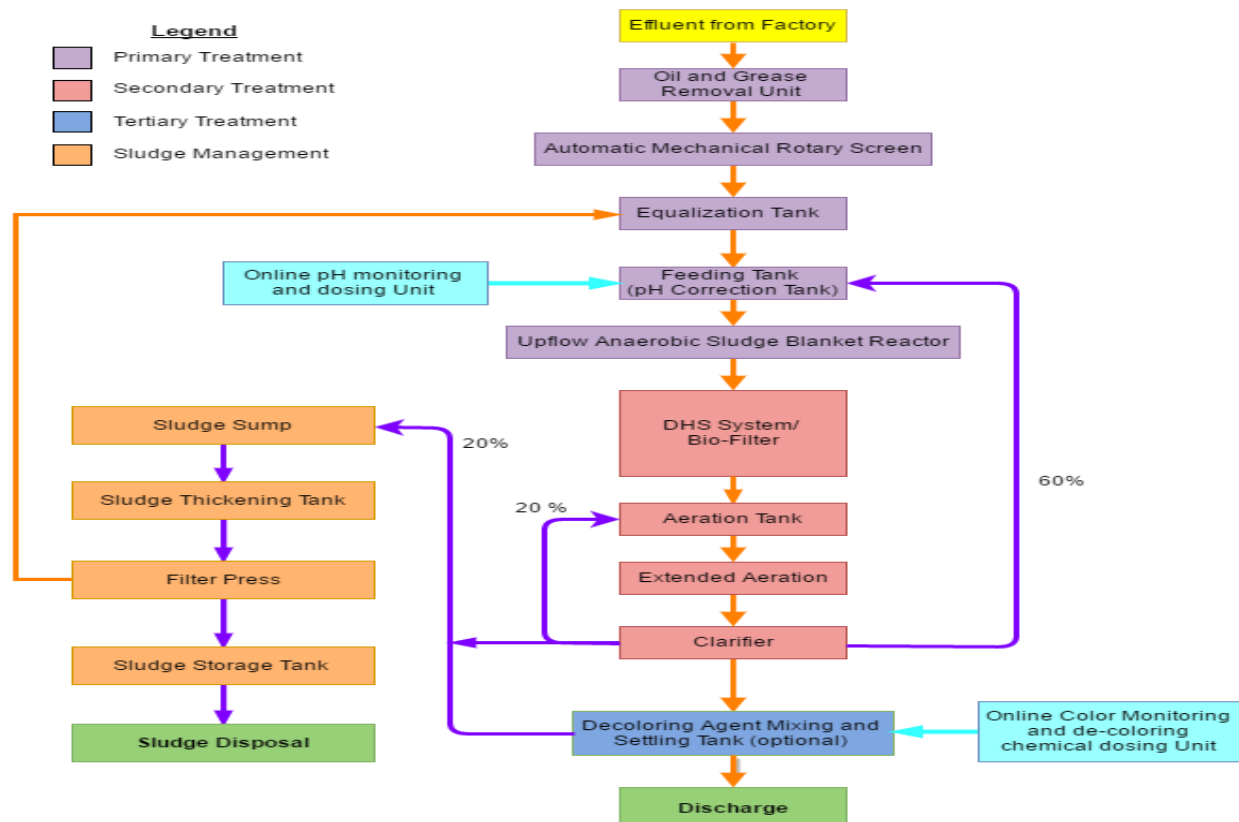
PARAMETERS	OUTLET
pH	7 – 7.5
DO mg/L	4.5-8 mg/l
BOD, mg/lit.	<30
COD, mg/lit	< 200
Total Suspended solids (TSS), mg/lit	< 30
TDS	<2000
Oil and Grease, mg/lit	< 10
Color	Clear

Anaerobic treatment is widely used around the world as a biological stage for industrial waste water treatment plant. The two principal advantages of anaerobic treatment over the aerobic treatment are production of biogas which can be used as fuel, and lower rate of production bio-mass which results in lower maintenance cost for the plant. The Up-flow Sludge Blanket Process is a suitable for Tropical regions as it works better under mesophilic conditions. It does not need any supporting structure for the development of micro-organisms which grow in the form of granules.

The Up-Flow Anaerobic Sludge Blanket-Bio Filtration Process is a high quality one having some favorable opportunities such as; low cost, simple operational mechanism and produces very negligible amount of sludge, and the organic matter can be converted into energy in the form of biogas. Therefore, anaerobic process is a highly beneficial process in terms of environmental protection and the process is economically viable. In Bangladesh, anaerobic process is completely a novel technology. It can reduce environmental pollution and can achieve energy in terms of biogas from wastewater. In this process in absence of oxygen, it converts organic compounds to CH₄ and CO₂.

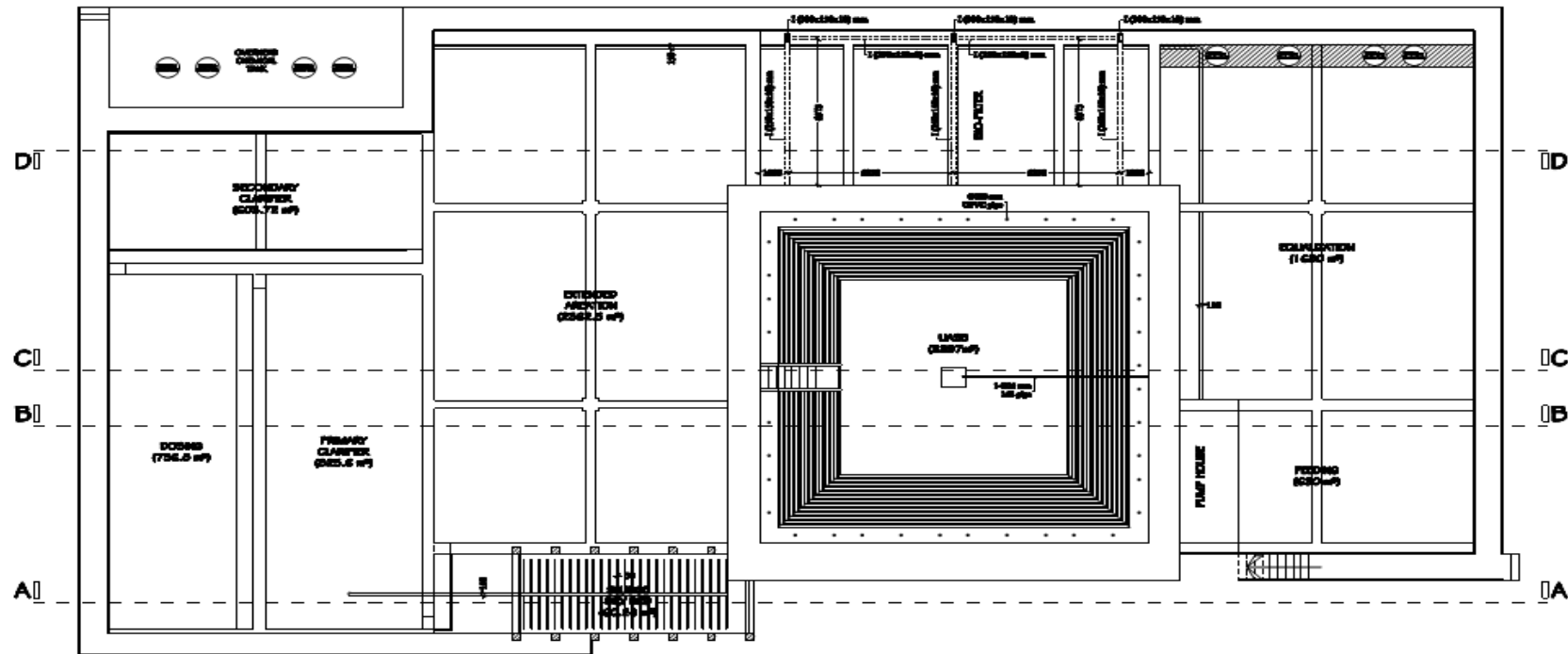
This CH₄ is an alternative source of bio-energy which will be utilized for power generation or domestic usage for cooking. This anaerobic digestion is a promising process used widely for the treatment of textile wastewater in tropical and subtropical countries like India, Brazil, Mexico and Malaysia. The successful application of anaerobic technology for treating textile wastewater depends on high-rate bio-reactors which achieve a high reaction rate per unit reactor volume by retaining the biomass in the reactor for long period. The ETP specifications and design calculation are included in Annexure- XI and Annexure XII. Solid retention time (SRT) is not dependent on the hydraulic retention time (HRT). Tosrifa Industries Limited ETP Plant process flow diagram and line diagram area shown in below figure 3.6 and Combine drainage (Storm water, Septic Tank Location and waste water) layout plan are included in Annexure- XIII.

a) ETP Process Diagram of TIL



b)

ETP Line Diagram of TIL



ETP ROOF PLAN

[illegible]

Figure 3.6: Biological Effluent Treatment Plant (ETP) of Tosrifa Industries Limited a) Process diagram b) Line diagram of ETP of TIL.

3.6.4 Sludge Management Process of TIL

Tosrifa Industry Limited is constructing a 60 m³/h biological effluent treatment plant for treatment of waste water from dyeing section. After the treatment of wastewater, they have some sludge. The excess sludge production will be minimum and finally it will be managed by using sludge dry bed and the minimal dry sludge will be stored at least 6 months in the besides of ETP site as per DoE sludge management guidelines and sent it to their vendor like City Corporation or other as per above Sludge management guidelines.

3.7 Lists of Machinery

Tosrifa Industries Limited will use some machinery for the manufacturing of textile fabric dyeing and dyeing finishing. The machinery lists of the project are given in below-

SI	Item Name with Specification	Brand	Country of Origin	Qty.
1	i. ERBATECH CONTINUOUS OPEN-WIDTH BLEACHING AND WASHING MACHINE "SCOUT TR1/D2/I1/2PW 1.6"	ERBATECH	Germany	1 Set
	ii. ERBATECH DYE Padder "SCOUT-COLOR DP/KN"	ERBATECH	Germany	1 Set
2	ERBATECH BATCH HANDLING 30AF/3RS/3HJ	ERBATECH	India	1 Set
3	i. HT SAMPLE DYEING MACHINE	DILMENLER	Turkey	1 Set
4	BRUCKNER HIGH CAPACITY SINGLE-LAYER STENTER TYPE POWER-FRAME VN SFP	BRUCKNER	Germany	1 Set
5	ROPE OPENER AND SLITTING LINE	BIANCO	Italy	1 Set
6	OPEN WIDTH KNIT FABRIC FELT COMPACTING RANGE	LAFER	Italy	1 Set
7	i. RAISING MACHINE	LAFER	Italy	1 Set
	ii. SHEARING MACHINE	LAFER	Italy	1 Set
8	REVERSING MACHINE WITH AIR FOR TUBULAR FABRIC	MERSAN	Turkey	2 Sets
9	AUTOMATIC TD-LAB DYE DISPENSER MACHINE	Dysin International	Germany	1 Set
10	MATHIS 2-ROLL LABORATORY Padder	MATHIS	Switzerland	1 Set
11	LAB TESTING EQUIPMENTS	SDL ATLAS	Hong KONG	1 Lot
12	LAB TESTING EQUIPMENTS	Data COLOR	Hong KONG	1 Lot
13	AIR COMPRESSURE - ROTARY SCREW TYPE AIR COOLED VARIABLE SPEED DRIVE AIR	ATLAS COPCO	Belgium	4 Sets
14	COMBIPAC SYSTEM BOILER MODEL CPFD 60 WITH CAPACITY 60000 KG/HR	THERMAX	India	1 Set
15	SKY LIGHT SHEET	APLOS GLOBAL LTD	USA	62 Pcs
16	BK type industrial Roots Blower	Supreme Step Development Ltd	China	1 set
17	SANTASHRINK PROGRESS DRYER (5 CHAMBERS)	SANTEX AG	Switzerland	1 Set
18	FIRE FIGHTING EQUIPMENTS	SFFECO	UAE	1 Lot
19	1,250 KVA PRIME DIESEL	Powerco Systems International	UK	1 Set
20	POWER BUSBAR TRUNKING SYSTEM AND STANDARD ACCESSORIES	FINETREND LTD	Turkey	1 Lot
21	FABRIC ROLLING MACHINE	SUNTECH INDUSTRIAL INT'L LTD	CHINA	12 SET
22	BOILER	WINNER TECH KOREA CO., LTD	Korea	1 set
23	TREATMENT PLANT	Supreme Step Development Ltd	China	1 set

Figure 3.7: Machinery lists of Tosrifa Industries Limited

3.8 Human Resource Development

Tosrifa Industries Limited values its workers and employees and strives to maintain high standard of labor practices to ensure congenial work environment for its workers and employees. After implementing 1st phase this project has employed 330 full time employees and after execution of 2nd phase the number of employee will be around 500. In dyeing industry, due to heavy physical works, females are not interested to work in dyeing factory but the Company TIL always highly appreciate female workers. It is notable that in garments division of TIL, more than 90% workers are female. When full project completed, in order to consider the woman empowerment in society the Company has plan to employ as much as possible females in suitable administrative jobs in project. The Company has a well-designed compensation package for the employees to encourage professionalism, greater productivity and stimulate teamwork. The Company provides the following benefits to the workers **in addition to the monthly salary and wages** which are illustrated below-

- Workers Profit Participation Fund
- Earn Leave Benefit
- Overtime & Bonus
- Medical Facilities
- Medical Insurance Benefit
- Day Care Facility
- Maternity Benefit
- Group Insurance Benefit

The project ensures enough safety measures and good working environment for the workers hired by the conductors/suppliers who work in the project for civil construction and machinery installations.

The Company maintains positive views regarding human resource development. In the garments division practices various vaccination programs for workers and a day care center established for female workers which will be available also in the fabric division.



Day Care for Children of Female Workers



Inauguration of Hepatitis B Vaccination Program

CHAPTER -4

BASELINE INFORMATION OF ENVIRONMENT

4.0 General Consideration

Environmental baseline is considered by examining the existing environment of the project site against which potential impacts from development activities of the project both during implementation and operation phases can be compared. Further, the objective of establishing the baseline for Important Environmental Components (IECs) such as water, air, soil, noise is influenced by the project intervention. The following sections describe the existing physical components of the project area.

Baseline Information on the Environment is essential to keep record of the existing environmental condition and to identify the impact; prediction and evaluation of impacts. The task is generally achieved by reviewing all available materials on the project and environmental settings and by performing field reconnaissance of the site or sites of the project. Field Work for collecting data has been carried out by adopting standard method of sampling and analysis in accordance with procedure carried out by recognized agency. Baseline study includes conditions of the physical resources, Environmental, biological resources and socioeconomic status of the project area.

The specific objectives of the baseline study were:

- To document the existing condition of physical and biological environment and prevailing socio-economic condition of the project areas;
- To identify the significant environmental and social aspects that are likely to be affected by the proposed project activities; and
- Setting of baseline parameters in order to identify possible adverse and beneficial impacts due to the proposed project activities.

This Chapter describes the baseline physical, biological and social environment of project areas based on the findings of the baseline surveys. The possible environmental impacts of the proposed project have been evaluated against these baseline environmental conditions.

4.1 Project Boundary

It is situated at holding no. 121/1, Block –H, Word no-07, Beraiderchala, Sreepur, Gazipur, Bangladesh. So the site is surrounded by Industrial area, residential area and Road. Total area of the project is 37.65 Bigha. The project site is easily accessible by road.

Side	Object
North side	Ansar Road & Aswad Composite Mills Limited (Unit-1)
South Side	Vacant Land, residential area and low lying area
East Side	8-10 Feet wide rural road and Designtex knitwear Limited
West side	Vacant Land/ Agricultural Land



North side of the project- Ansar Road & Aswad Composite Mills limited (Unit-1)



South Side of the project -low lying area, vacant land, residential area



East Side of the project- Road and Designtex Knitwear Limited



West Side of the project- vacant land

Figure 4.1: Tosrifa Industries Limited around project site (East, West, North & South)

4.2 Physico- Chemical Environments

Physical Environmental Resources include topography, geological, soil, meteorological condition, and hydrology; in the following sections this aspect in the project area is discussed.

4.2.1 Geology and Land

The Project area is located holding no. 121/1, Block –H, Word no-07, Beraiderchala, Sreepur, Gazipur, Bangladesh. Within the 1 km radius most of the land is used for fisheries, agricultural, bare, industrial and commercial purpose. There are few industry are situated within the periphery of the project. No high rise building, monuments or site of historic archeological interest were observed near the site. Scattered patches of forests are found in the different side of the project. From the nature the surrounding areas, the land use pattern considered as industrial and residential and some are fallow bare land and agricultural land and scattered forest land. There is no other installation of environmental concern exists around the site.

4.2.2 Land use and Soil Composition

The land of the planning area is composed of alluvial soil of the Pleistocene period. The height of the land gradually increases from the east to the west. The Southern part is composed of alluvial soil of the Bongshai River and Turag River. Main Rivers are the Bongshai, The Turag, the Dhaleshwari, the Shitalakhya, the Buriganga, and the Balu River.

The soil formation in Bangladesh is remarkably homogeneous in appearance, both vertically and laterally. It comprises layer of unconsolidated clay, about 10 m thick near Dhaka, but apparently thinner to the east and possibly much thicker in the west of the Rajshahi district. The sand mineralogy in this area is broadly similar to that of the tertiary hill sediments. Mineral contents of the soil are high in quartz, relatively low in feldspar and mica, and with zircon, tourmaline, kyanite, staurolite, sillimanite, and epidote dominating the heavy mineral fractions. The content of easily weatherable minerals ranges from 4 to 9%. The soil of Bangladesh can broadly be classified into seven tracts: (1) Madhupur Tract or Red Soil Tract, (2) Barind Tract, (3) Tista Silt, (4) Brahmaputra Alluvium, (5) Gangetic Alluvium, (6) Coastal Saline Tract, and (7) Hill Tracts. Figure 4.14 shows the position of the project site on the soil tract map of Bangladesh.

Madhupur tract or red soil tract comprises the former greater districts of Dhaka and Mymensingh and some isolated area in Chittagong, Comilla and Sylhet district. The pH Value ranges from 5.5 to 6.0 in the top soil.

4.2.3 Meteorology

Bangladesh is located at the central part within the Asiatic monsoon region where the climate is tropical. Relatively small size of the country and generally low-lying area cause moderate spatial variation of temperature, precipitation, relative humidity, wind speeds and other climatic variables.

However, the climate of Bangladesh exhibits pronounced temporal variability. This is because of the moisture-laden monsoon winds flowing predominantly from the south-west during summer and the comparatively dry and colder north-western winds during winter.

There are two marked seasons: the rainy seasons from May to October, during which more than 85% of the total annual rainfall occurs and the dry season from November to April. The beginning of the rainy season vary from year to year, heavy rains may commence anywhere between mid-April and early June and may end anywhere between the end of September and mid-November. Usually winter season is dry with occasional rains. The early summer season is considered from March-April. During summer the air becomes hot with very low humidity. Early summer is also dominated by Baishaki cyclone and rains.

The climatic variables monitored at the Bangladesh Meteorological Organization, Dhaka station have been assumed to represent the climatic condition of the project area. Different meteorological data like rainfall, temperature, relative humidity and wind speeds monitored at the meteorological station in Dhaka are described in the following sub-sections and summarized in Table 4.1.

Table 4.1: Monthly Averages of Climatic Variables at the Dhaka BMD Station, 2001-2013

Month	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Rainfall (mm)	5	14	29	111	212	326	350	290	316	155	19	11
Mean Temp (°C)	18.0	21.9	26.0	28.1	28.5	28.4	28.3	28.5	28.2	27.1	23.7	19.9
Max Temp (°C)	28.3	32.3	36.0	36.7	36.5	35.7	34.8	34.8	35.0	34.8	32.3	29.2
Min Temp (°C)	10.1	12.4	16.5	19.3	20.6	22.7	23.9	24.0	23.7	20.6	15.8	11.8
Humidity (%)	69	60	59	68	72	80	81	80	80	76	70	71
Sunshine (Hours)	5.7	7.3	7.5	7.7	6.8	3.4	4.0	4.5	4.2	5.7	6.8	5.8
Solar Radiation (Cal/cm ² /min)	166	207	231	244	229	175	189	192	172	183	174	146
Evaporation (mm/d)	2.6	4.0	5.0	5.5	5.3	4.1	3.8	3.8	3.6	3.5	3.3	2.5

Source: Bangladesh Meteorological Organization (BMO)

4.2.4. Water Quality

4.2.4.1 Surface Water quality

The primary surface water body in the area is pond; however there are some ditches and canals around the area. As there are substantial industrial and urban activities on the bank of the river and discharges from these are largely unregulated, The Water quality of the canal becomes quite poor in the dry seasons but the water quality improve in the rainy season due to dilution from increased flow. The surface water quality parameter in the study area has been tested from GECL Laboratory. The tested parameters are given below in Table 4.2 and Test report is included in **Annexure XIV**. The GPS Location of two samples of Surface water was 24° 11 33.88 "N & 90°24 39.01" E and 24°11 46.52" N & 90°24 41.43" E.

Table 4.2: Analysis of surface water Samples collected from different locations of the study areas.

SI NO.	Water Quality Parameter	Unit	Concentration Present		DoE (Bangladesh) Standard for Inland Surface Water	Method of Analysis
			Sample 1 (Canal water near Standard Garments)	Sample 2 (Canal Water Near Aswad composite Mills Unit-1)		
1	pH	-	6.21	6.79	6.0-9.0	pH Meter
2	Color	Hazen	17.31	14.21	-	UV visible conductivity Prove
3	Turbidity	NTU	39.32	36.21	-	UV visible
4	Total Dissolved Solid (TDS)	mg/l	912	778	2100	Vernier conductivity Prove
5	Chloride (Cl)	mg/l	23.41	32.19	600	Titrimetric
6	Total Suspended Solid (TSS)	mg/l	43	65	150	Gravimetric with 42 no filter paper
7	Dissolved Oxygen (DO)	mg/l	1.1	0.9	4.5-8.0	Azide modification
8	Ammonia-Nitrogen (NH ₃ -N)	mg/l	73	82	50	UV visible at 410 nm
9	Biochemical Oxygen Demand (BOD ₅)	mg/l	86	91	50	Dilution
10	Chemical Oxygen Demand (COD)	mg/l	335	357	200	COD Refluction
11	Electrical Conductivity (EC) at 25°	μS/cm	1822	1553	1200	Vernier conductivity Prove

Note: Field Sampling, 31st January, 2018

4.2.4.2 Groundwater Quality

Ground water level exists at moderate (generally below 9 m) depth which is being recharged mainly by infiltration of rainwater. Ground water is a stable source of domestics and industrial purposes in this area. Ground water is used for Irrigation purposes in this area. There is no complaint regarding non availability of Ground water in this area. Figure 4.2 shows the location of the TIL project site on the groundwater zoning map of Bangladesh. It can be seen from the map that groundwater is available at the project site around 15.0 - 20.0 m below the ground surface.

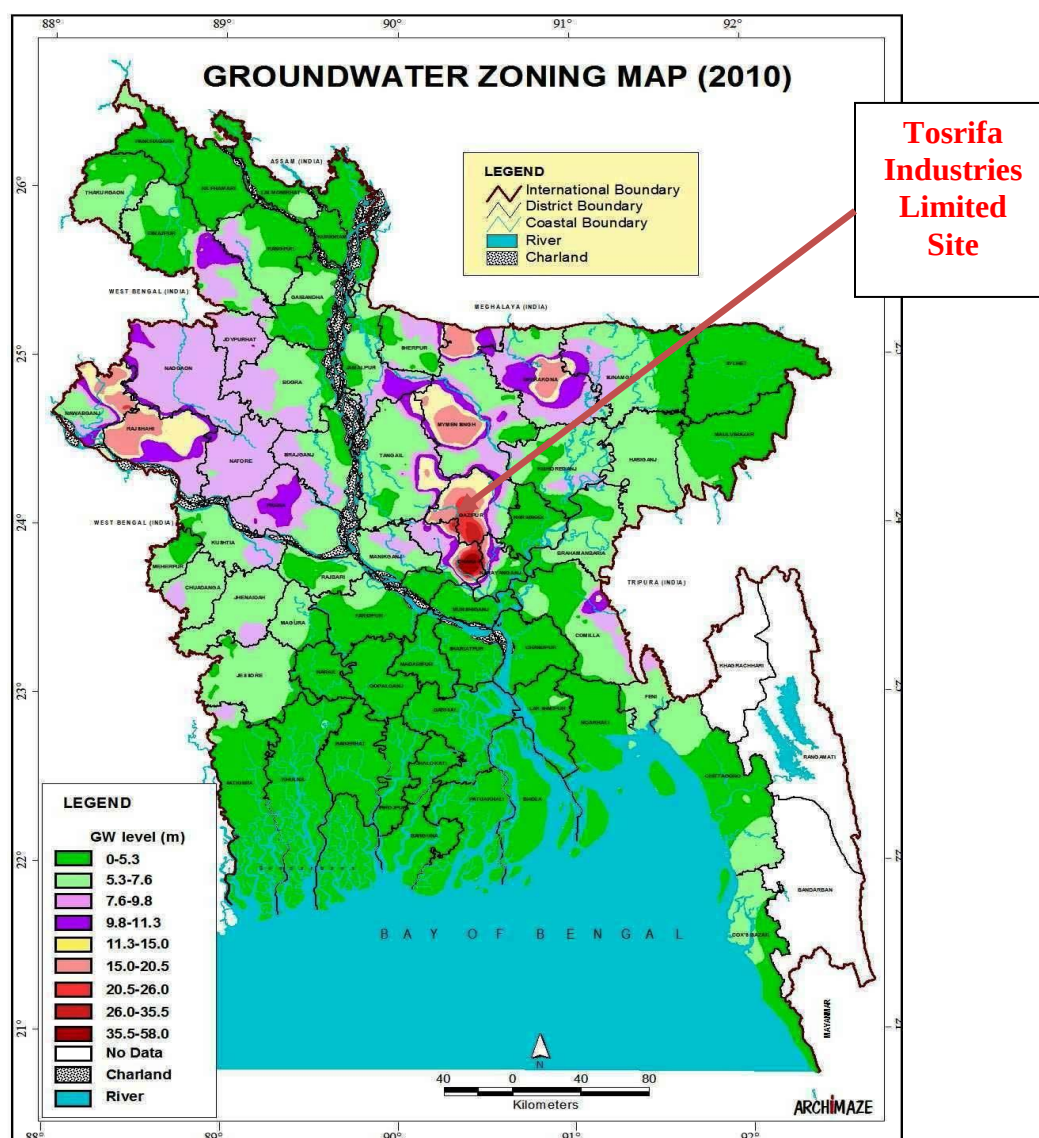


Figure 4.2: Location of the TIL project site on the Groundwater Zoning Map 2010 of Bangladesh (map source: Bangladesh Agricultural Development Corporation)

Tosrifa Industries Limited will use ground water for all the purposes. They will need 375 cubic meter water per day. Tosrifa Industries Limited will have Dyeing, washing activities in their facility and have waste water. They have 60 m³/h Biological Effluent Treatment plant to treat waste water from different production process. The Sludge from the ETP has managed as per

DoE Sludge Management Guidelines. The ground water quality parameter in the study area has been tested from Environmental Engineering Laboratory (BUET). The tested result is shown below-in Table 4.3 and Ground water test report is included in **Annexure- XV**.

Table 4.3: Summary of ground water Quality in the study area

SI No.	Water Quality Parameters	Unit	Concentrations Present	Bangladesh Standard for Drinking Water (ECR'1997)	WHO Guidelines Value, 2004
1	pH	-	6.45	6.5-8.5	6.5-8.5
2	Color	Pt-CO	3	15	15
3	Turbidity	NTU	0.8	10	5
4	Total Hardness (as CaCO ₃)	Mg/l	54	200-500	500
5	Chloride (Cl)	Mg/l	14	150-600	250
6	Total Dissolved Solid (TDS)	Mg/l	129	1000	1000
7	Manganese (Mn)	Mg/l	0.008	0.1	0.4
8	Iron (Fe)	Mg/l	0.02	0.3-1.0	0.3
9	Total Coliform (TC)	CFU/100ml	Nil	0	0
10	Fecal Coliform (FC)	CFU/100ml	Nil	0	0
11	Arsenic (As)	Mg/l	0.001	0.05	0.01
12	Amonia-Nitrogen (NH ₃ -N)	Mg/l	<MDL	0.5	1.5

Note: Field Sampling, 17th August, 2017

4. 2.5 Air Quality

Air quality in the Gazipur City and its adjacent areas is deteriorating from natural and manmade reasons. Air pollution is one of the major environmental pollutions commonly reported in every industrial towns and cities. Air quality standards prescribe pollutant levels (REF: DoE, 1997) that cannot be legally exceeded during a specific time period in a geographical area. The emissions of air pollutants therefore need to be controlled so that the ground level concentrations (GLCs) for these pollutants do not exceed the ambient air quality. Air quality depends on the presence of pollutants in atmosphere in higher concentration than standard. This pollutant includes gases (SO₂, NO₂, CO and SPM).

The local area may be classified as mixed industrial areas defined and found from survey. Air quality, based on analysis carried out by sampling at site shows the SPM, CO, SO₂ & NO_x concentrations in the ambient air is far below the allowable limit except SPM. According to the Air quality standard the Suspended Particulate Matter (SPM) is high in the project site because of construction project. The weather was Sunny. Since the wind direction was from the south-east to north-west corner and still has reasonable buffer/assimilation capacity to absorb air pollutants to a certain extent. Therefore, these are within the prescribed limit of the National Air Quality Standards. The analysis report is tested from GECL Laboratory and is furnished

below in Table-4.4 and Test report is included in **Annexure XVI**. The Table includes the Air pollutants by the existing Project site and figure 4.3. GPS Location of two points of Air quality is 24°11 37.712" N & 90°24 57.197" E and 24°11 40.88" N & 90°24 48.93" E.

Table 4.4: Average Ambient Air Quality inside the project area

SL. No.	Test Parameter	Units	Method of Analysis	Result		DoE' 2005 Standard for Ambient Air	IFC/World Bank Standard' 2007	Remarks
				Project Main Gate area	In front of Building 6			
1	SO ₂	µg/m ³	West-Gaeke	23	21	365	125	Acceptable
2	NO _x	µg/m ³	Jacob and Hochheiser	26	29	100	200	Acceptable
3	CO	µg/m ³	CO Meter	176	185	10000	NYS	Acceptable
4	SPM	µg/m ³	Gravimetric	291	283	200	NYS	Not Acceptable
5	PM ₁₀	µg/m ³	Gravimetric	91	87	150	150	Acceptable

Source: Field Sampling, 17th August, 2017

Note: SO₂ = Sulfur dioxide;
 (NO+NO₂) = Nitrogen Oxides
 CO = Carbon Monoxide,
 CO₂ = Carbon Dioxide,
 SPM = Suspended Particulate Matter,
 PM₁₀ = Particulate Matter 10,
 NYS= Not Yet Set.



Figure 4.3: Ambient Air Quality Sampling

4.2.6 Air Temperature and Humidity

Air temperature is a computation of how hot or cold the air is it. It is the most frequently measured weather parameter. The temperature of the country is related to the period of rainfall. In the month of December – January the temperature remain cold but the temperature is increasing in the month of March, April. We found the temperature of Dhaka from Bangladesh Meteorological Organization during last 13 years (Table 4.5). Here we found maximum temperature 35.6 °C in the year of 2009 and minimum temperature was 21.8 °C in the year of 2003.

Table 4.5: Monthly maximum and minimum temperature near the Project area 2000-2012

Year	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Maximum Temp. °C	Minimum Temp. °C
2000	24.6	25.5	30.9	32.8	32.3	32.5	31.8	32.1	32.0	31.1	29.6	26.4	32.8	24.6
2001	24.4	28.7	32.7	34.4	32.0	31.0	31.7	32.4	31.9	31.6	28.9	25.9	34.4	24.4

2002	25.4	28.6	31.8	32.1	32.1	31.7	31.6	31.5	32.4	31.4	28.9	26.1	32.4	25.4
2003	21.8	28.0	30.0	34.0	34.0	31.4	32.4	32.5	31.7	31.2	29.8	25.9	34	21.8
2004	23.5	28.3	32.8	32.6	35.1	32.2	31.5	32.3	30.4	31.0	29.5	27.0	35.1	23.5
2005	24.5	29.1	32.2	34.4	33.2	33.4	31.5	32.1	32.8	30.6	29.1	27.1	34.4	24.5
2006	25.3	31.3	33.2	33.7	33.8	32.4	32.4	32.5	31.9	32.3	23.7	26.9	33.8	25.3
2007	24.6	27.1	31.5	33.7	34.8	32.5	31.5	32.5	32.1	31.5	29.1	25.8	34.8	24.6
2008	24.5	26.1	31.7	34.5	34.7	31.3	31.8	31.1	32.6	31.4	29.7	25.6	34.7	24.5
2009	25.9	29.7	33.3	35.6	34.6	34.5	32.3	32.5	32.5	32.2	30.2	26.0	35.6	25.9
2010	23.8	28.9	34.1	35.5	34.3	33.1	33.0	33.1	32.5	32.4	30.1	26.1	35.5	23.8
2011	23.4	28.7	32.1	33.5	33.4	32.6	33.3	31.1	32.4	32.7	29.7	25.0	33.5	23.4
2012	23.4	28.7	32.1	33.5	33.4	32.6	32.3	31.1	32.4	32.7	29.7	25.0	33.5	23.4

Source: Bangladesh Meteorological Organization (BMO)

4.2.6.1 Tested Air Temperature and Humidity

According to OSHA 3154 (1998) Standard for Temperature (26.7 °C - 35.0 °C) and Humidity (30% -60%). The results of the workplace Temperature Level ranges between 33.9 °C to 35.0 °C and Humidity level ranges between 57.9 % RH to 60.0 % RH. The highest temperature level measured is 35.0 °C in Near ETP area and the lowest temperature level measured is 33.9 °C in Near Husk Boiler area. The highest humidity level measured is 60.0 % RH in Near Husk Boiler area and the lowest humidity level measured is 57.9 % RH in Near ETP area.

So the Temperature & Humidity level of Tosrifa Industries Limited was satisfactory and acceptable according to OSHA Standard. The Temperature and Humidity ranges are shown in Table 4.6 and Sampling Picture is shown in Figure 4.4 and Test report is shown in **Annexure XVII**.

Table 4.6 Show the Temperature and Humidity level Measurement inside the project area.

Sl. No.	Name of Sections	Location	Obtained Result	
			Temperature (°C)	Relative Humidity (%)
1	North Side of the Project	Around the project area	34.9	59.3
2	East Side of the Project		34.0	59.8
3	South side of the Project		34.7	58.0
4	West side of the Project		34.6	59.0
5	Middle Point of the project		34.4	58.2
6	Construction area		34.8	59.3
7	Near Factory Main gate		34.0	58.0
8	Near Husk Boiler area		33.9	60.0
9	Near ETP area		35.0	57.9
10	Near Main Production building area		34.1	59.5

Source: Field Sampling, 17th August, 2017

Sampling Picture:



Figure 4.4: Temperature and Humidity Level Assessment during field visit

4.2.7 Noise Quality

Existing ambient noise levels in the vicinity of the TIL was monitored using a noise level meter. The sample locations were selected based on factors such as: sensitivity to noise and proximity to the project site. The Environmental quality standard for Bangladesh Noise Control Rules 2006 has set noise guidelines for industrial sites in Bangladesh. Noise level should not exceed 75 dB (A) Leq* in the daytime and 70 dB (A) Leq* at night. Facility operation should ensure in some area that those noises do not exceed more than 50 meters away from the facility. Hearing protection should be provided to workers where noise levels exceed 80 dBA. The Project site has started construction activities and they have many activities. The existing noise levels in the proposed area are within the range of Bangladesh Environmental quality standard for industrial zone. During Field visit maximum and minimum recorded noise level in the site is 62.0 dBA and 79.0 dBA accordingly. The noise level is measured a noise level meter. The noise level test report is incorporated in **Annexure XVIII**. The Sampling Picture is shown in Figure-4.5. Table 4.7 Show the Noise Level Assessment inside the project area.

Sl. No.	Name of Sections	GPS Location	According to Noise Pollution Control Rules 2006 recommendation value for sound level is 75 and 70 dB (A) Leq* at day and night	Obtained value	Remarks
1	North Side of the Project	24°11 39.90" N 90°24 51.13" E		66.0	Acceptable
2	East Side of the Project	24°11 36.04" N 90°24 57.54" E		64.0	Acceptable
3	South side of the Project	24°11 39.99" N 90°24 48.70" E		67.0	Acceptable
4	West side of the Project	24°11 44.31" N 90°24 41.71" E		55.0	Acceptable
5	Middle Point of the project	24°11 41.79" N 90°24 46.65" E		63.0	Acceptable
6	Construction area	24°11 39.76" N 90°24 50.45" E		79.0	Not Acceptable

7	Near Factory Main gate	24°11 35.78" N 90°24 57.20" E		62.0	Acceptable
8	Near Husk Boiler area	24°11 42.83" N 90°24 41.66" E		65.0	Acceptable
9	Near ETP area	24°11 45.24" N 90°24 44.69" E		68.5	Acceptable
10	Near Main Production building area	24°11 41.99" N 90°24 46.06" E		66.5	Acceptable

Source: Field Sampling, 17th August, 2017



Figure 4.5: Noise Level Assessment during field visit

4.2.8 Soil Quality

This section of the report deals with the soil quality inside the project area. Soil quality is the capacity of a specific kind of soil to function, within natural or managed ecosystem boundaries, to sustain plant and animal productivity, maintain or enhance water and air quality and support human health and habitation. Soil quality is said to be a measure of the condition of soil relative to the requirements of one or more biotic species and or to any human need or purpose.

Soil quality reflects how well a soil performs the functions of maintaining biodiversity and productivity, partitioning water and solute flow, filtering and buffering, nutrient cycling, and providing support for plants and other structures. Soil management has a major impact on soil

quality. Tosrifa Industries Limited has tested their soil quality from Bangladesh Council of Scientific and Industrial Research (BCSIR). The Soil sample has collected from 2 points inside the Project area. The result of the soil test is given below table 4.8 and Test Result is shown in **Annexure- XIX**.

Table 4.8: Soil Test report of Tosrifa Industries Limited

SL	Parameters	Results		Methodology
		Sampling-1 Near Production area	Sampling -2 Near Factory Main gate	
1	Arsenic (As)	4.68	3.92 ppm	SSSA Method
2	Cadmium (Cd)	0.99	0.89 ppm	SSSA Method
3	Chromium (Cr)	6.13	14.99 ppm	SSSA Method
4	Lead (Pb)	7.48	19.32 ppm	SSSA Method
5	Mercury (Hg)	26.69	21.58 ppb	SSSA Method
6	pH	3.95	5.14	SSSA Method pH Meter

Sources: Analytical Lab (BCSIR, 2017)

4.2.9 Solid Waste

The solid waste generated during construction and operation phase of the project has been mostly generated by industrial, residential, commercial and institutional sources and activities. The various types of solid wastes are wood and bamboo, wastage rod, pieces of steel etc. The biodegradable and non-biodegradable waste is collected, segregated, transferred, and disposed of as per the standard. Tosrifa Industries Limited will follow the Solid Waste Management procedures during construction which are shown in Figure 4.6.



Figure 4.6: Solid Waste Management of Tosrifa Industries Limited during construction

4.2.10 Seismicity

The Seismic Map of Bangladesh shows the epicenter location have been conformity with the presenting knowledge of faulting and other structural behaviors of the resign. Earthquake event in the shelf zone are random and follow the occurrence of the surface fault. Gazipur is too much vulnerable of earthquake disaster due to some reasons. First of all the population density

is very high in Gazipur city. Secondly, it is predicted that the secondary hazard like fire break out from gas and electricity line will have more disastrous impact after earthquake.

Thirdly, not only building codes are not maintain during construction time of most of the high rise apartment buildings and most garment factory buildings but also they have been constructed without open spaces and most have encroached upon the streets and roadways. As a result, the collapse of these structures will block streets, further hindering rescue operations. But Tosrifa Industries Limited has maintained all the rules and regulations for building/ Shed construction.

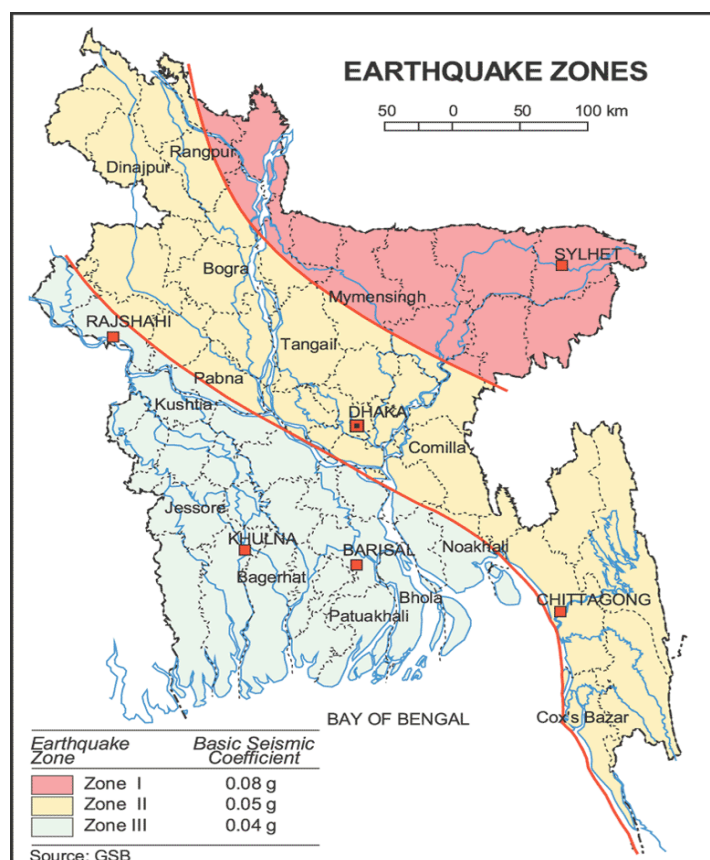


Figure 4.7: Earth quake Zone of Bangladesh

4.3 Biological Environment

4.3.1 Background

This section of the report deals with flora and fauna near the proposed project area. The consultant made ecological assessment of existing flora and fauna around the study area. The study area is rich in plant and faunal diversity. The ecological setting of the project is mostly homestead and roadside vegetation & scattered forests etc. This report is prepared on the basis of field trip, available published and unpublished information. The project site is located outside of the area of the Bhawal National Park and also excluded from forbiddar mouza's of Gazipur District.

4.3.2 Ecological and Conservation Designations

4.3.2.1 Overview

The Bangladesh Wildlife (Preservation) Order, 1973, promulgated under Presidential Order No.23 has been enacted and amended in two phases as the Bangladesh Wildlife (Preservation) Amendment) Act. This provides for the establishment of national parks, wildlife sanctuaries, game reserves, and private game reserves. Each of these designations is briefly described below:

4.3.2.2 National Parks

A National Park is defined in Bangladesh as “a comparatively large area of outstanding scenic or natural beauty, in which the protection of wildlife and preservation of the scenery, flora and fauna in their natural state is the primary objective, and to which the public may be allowed access for recreation, education and research”. Activities prohibited in the country’s National Parks include hunting, trapping, felling, destroying or burning plants or trees, cultivation, mining or pollution of waterways. National Parks does not exist in the Area of Influence (AOI) of the project.

4.3.2.3 Wildlife Sanctuaries

In Bangladesh, Wildlife Sanctuaries represent an area closed to hunting and maintained as an undisturbed breeding ground. Such sites are primarily for the protection of wildlife including all natural resources such as vegetation, soil and water. Under Article 23, Wildlife Sanctuaries are assigned a greater degree of protection than National Parks in Bangladesh although the restrictions on activities are broadly similar. Such establishments are also not available in the AOI.

4.3.2.4 Game Reserves

These represent an area in which wildlife is protected to enable populations of important species to increase. Here the capture of wild animal is prohibited although hunting and shooting may be allowed on a permit basis. The proposed project site is not situated in or near any reserve forest.

4.3.2.5 Private Game Reserves

A private game reserve is an area of land set aside by the owner to broadly fulfill the same purpose as any other game reserve. The owner who shall exercise all the powers of an officer under this Act establishes such areas following application. The proposed project site is not situated in such reserves.

4.3.2.6 Reserve Forest

The Forest Act, 1927, 1994 enables the government to declare any forest or waste land to be reserved for protected forest. Most activities are generally prohibited in reserve forests although certain actions such as the removal of forest produce may be permitted under license in protected forest. Prohibited activities include enlargement of clearings, cultivation and quarrying etc. The existing project site is not situated in or near any reserve forest.

4.3.2.7 Other Designations

Bangladesh is also a party to the Convention concerning the Protection of World Cultural and Natural Heritage (World Heritage Convention), which it accepted on 3 August 1983. The Sunderbans mangrove forests, Naluar Haor represent the areas in Bangladesh represent World Heritage Sites/ Ramsar Sites. These sites are located in other districts of Bangladesh and far away from the project AOI.

4.3.2.8 Ecological and Conservation Designations in the Project Area

Location of the project area in relation to the country's forests and protected areas. No protected habitats or reserve forests occur within 1 km of the site. It is, therefore, concluded that these areas are outside of the project's AOI.

4.4 Terrestrial Ecology

4.4.1 Terrestrial Flora

There are few patches natural forest near the project site as industrial and commercial establishments is dominating the area. These forestlands of this area are now well conserving; the composition of plant community is slow growing and herbaceous vegetation as well as other flora. Floral Species of the study area are given below in table 4.9.

Table 4.9: Some Floral Species in the study area

English Name	Scientific Name	Local Name	Use
Grass			
Grass	<i>Spontaneum</i> <i>Sccharum</i> <i>Cynodon Dactylon</i>	Khar Gash	Fuel/Covering Soil binder
Trees			
Lichi	<i>Lichi Chinensis</i>	Lichu	Fruit
Mango	<i>Mangefira Indica</i>	Alm	Fruit/Timber
Bate Plam	<i>Phoenix Sylvestris</i>	Khejur	Fruit/Timber
Black Berry	<i>Syzgium Cumini</i>	Jam	Fruit/Timber
Jack Fruit	<i>Heterophyllus</i>	Khatal	Fruit/Timber
Cocunut	<i>Cocos unifera</i>	Pape	Fruit/Timber
Guaba	<i>Pasidium Suajva</i>	Piara	Fruit/fuel
Banana	<i>Musa Sepaientum</i>	kala	Fruit/Timber
Wood Tree			
Timber/Fuel Wood Mehagani	<i>Shorea Rubasta</i> <i>Salmalia</i> <i>Malabaricum</i>	Shil koro Shik Cotton	Fuel/Timber

Source: Field Visit, 2017

4.4.2 Terrestrial Fauna

A number of species were observed in the Aol including many common birds typical of the open countryside such as the roller *Coracais benghalensis*, and the bee eaters *Meliops superciliosus*, and *Meliops orientalis*, crow, parakeet, eagle, *shalik*, sparrow etc. Besides this avian species, the habitats are likely to have variety of reptile, mammals and invertebrates. No record of wild animals and endangered species are found in the project area. The Faunal Species are shown in Table 4.10 and Fish Species Table 4.11.

Table 4.10: Faunal Species in the project study areas

Scientific Name	English Name	Local Name
Amphibians:		
<i>Bofo melanostictus</i>	Common Toad	Bang
<i>Rana Cyanophyctis</i>	Skipper Frog	Bang
Mammals:		
<i>Callosciurus sp</i>	Squirrel	Kat Biral
<i>Funmbalus pennant</i>	Squirrel	Kat Brial
<i>Herpestes</i>	Mongoose	Bheji
<i>Auropuncatus</i>	Field Mouse	Idur
<i>Mus musculus</i>	House Mouse	Nengti Idur
Avian:		
<i>Copsychus saularis</i>	Ribbon	Doel
<i>Corvus splendens</i>	House Crow	Kak
<i>Egretta gazatta</i>	Great Egret	Baro Bak
<i>Durrurus adsimilies</i>	House Sparrow	Choroi

Table-4.11: Fish species in the project area

English Name	Scientific Name	Local Name
Prawn	<i>Macrobrachium malcolmsoni</i>	<i>Icha</i>
Cat Fish	<i>Mystus Vittatus</i> <i>Mystus Vittatus</i>	<i>Tengera</i> <i>Golisha Tengra</i>
Major Carp	<i>Labeo rohita</i> <i>Catal catal</i> <i>Cirrhinus mrigala</i>	<i>Rui</i> <i>Catla</i> <i>Mrigal</i>
Minor Carp	<i>Puntius sp</i>	<i>Puti</i>
Snakehead	<i>Channa Punctatus</i>	<i>Taki</i>
Eel	<i>Mastacembelus armatus</i>	<i>Bain</i>

Source: Field Visit, 2017

During The ecological survey some flora and fauna has found in the study area these are given below in figure- 4.8.



Figure 4.8: Floral and Faunal composition in the study area

4.5 Socio Economic Condition

This Section Discuss socio economic condition of the project area. Both Primary and Secondary sources data were utilized for understanding socio economic condition at the project area.

4.5.1 Population and Social Structure

The total population of Gazipur district is 34, 03,912 (Male- 17, 75,310 and Female- 16, 28,602), sex ratio 109:100, population density 1884/Sq Km and annual growth rate is 5.21% (BBS, 2011).

4.5.2 Living and Cultural Condition

The study area is connected to Dhaka-Mymensingh highway. The Transportation facilities are available in the study area. Most of the branch roads are generally pacca and remaining are kacha road. All kind of heavy vehicles use this highway and light weighted vehicles like Scoter, cars, Rickshaw play on both highway and branch roads.

The Study area located beside the city of Gazipur. Presently it is dedicated area for industrial development. Major housing of this area is of semipaka, multistoried, Kacha. Average Literacy Rate of Gazipur district is 62.60% (Male- 66.00% and Female- 58.90%), School attendance rate is 42.50% for 5 to 24 years age group. The culture of the area is a composite and has assimilated influences of Hindusium, Buddish, Islam, and Christianity. The Project will not interfere on the physical and cultural heritage.

4.5.3 Agriculture

Agriculture work signifies all activities of holder and his/her labour force doing planning, management, and operation of a holding. It includes land preparation, sowing, weeding, harvesting, feeding and tending livestock & poultry, kitchen gardening, supervising agricultural workers, keeping farm records & accounts, preparing agriculture products for marketing (including packaging), repairing farm equipment, constructing farm buildings & fences, and engaging in land reclamation and improvement and other related activities. It excludes home and other family domestic chores.

4.5.4 Public Health

There are significant numbers of different types of clinic and medicine shops established beside the proposed project area where the doctor also privately practicing. Moreover The Government hospital is not far from the project site.

4.5.5 Industry and Commerce

As Mention earlier, there are a number of different types of industries already existing in the study area. These includes mostly textile, Ready mate garments, Washing, Dyeing etc.

4.5.6 Archeological Heritage

There are no historical sites or Structures of archeological paleontological or architectural significance within the project areas.

4.5.7 Life Pattern

Life pattern near about the project area is good because this area is gradually developed and expanding to job opportunity for local People.

4.6 Social Safeguard

Social safeguard policies are essential tools to prevent and mitigate undue harm to people during the development process. When identifying and designing a project, safeguards should help assess the potential social risks and impacts (positive or negative) associated with a development intervention. TIL requires land area of 1,256.55 decimal where 437.87 decimal owned by TIL and 818.68 decimal taken leased from Northern Knit Limited (NKL) for 25 years. NKL is a sister concern of TIL under common directorship. The lands were purchased from willing sellers at market values over the period from 2005 to 2016. The project has plan to purchase further around 150 decimal land for project requirements from willing sellers at market price. Out of total land area in 1st phase 35% land used for production building and other utility buildings. In 2nd phase 10% land used for knitting building and rest 55% land will be used for internal road, gardens and free spaces. The areas of the project are segmented into different building area are shown in table- 4.12

Table 4.12: Layout description of Tosrifa Industries Limited Project

SI No.	Building Name	Area (Sft.)
1	Production Building	117,412
2	Utility Building	18,882
3	WTP & Chemical Store	33,318
4	ETP	14,384
5	Husk Boiler Building	16,750
6	Knitting Building	81,180
7	Yarn Store Building	23145
	Total	<u>305,071</u>

This project is established in a vacant land area owned by villagers around the project. In time of project planning the Company management made an informal baseline survey as like community meeting with the villagers. It appeared that the relevant stakeholders had the positive view to this project. The villagers think that this project will bring about many positive returns for them – job opportunity, increase of economic activities in community, house-rent income form workers who will work in this project, CSR activities of the project and other socio-economic benefits. There were also appeared some negative views as sound pollution, traffic

congestion, road damage, impacts from labor influx and environmental impact. The project management was able to convince the relevant stakeholders that the Company will take required steps to manage and mitigate the impacts when needed.

4.7 Working Conditions of Labor

Working conditions cover a broad range of topics and issues, from working time (hours of work, rest periods, and work schedules) to remuneration, as well as the physical conditions and mental demands that exist in the workplace. During Construction and Operation, TIL will provide all the facility to workers and have some policy as per Bangladesh Labor Law 2006 and Labor Rules 2015 and World Bank Guidelines.

In dyeing industry, due to heavy physical works, females are not interested to work in dyeing factory but the Company TIL always highly appreciate female workers. It is notable that in garments division of TIL, more than 90% workers are female. When full project completed, in order to consider the woman empowerment in society the Company has plan to employ as much as possible females in suitable administrative jobs in project.

During construction stage the Company tries to recruit as much as possible labors from local community but for skilled workers it needs to bring migrated workers in the project. Out of total 1078 workers in different time periods, 395 from local community and 683 were migrated from outsides. The labor camps were arranged for 534 migrated workers and 149 labors arranged their accommodation in locality around the project. The company tries at level best to manage these migrated workers that they cannot create any kind of negative social and environmental impacts in the local community.

During construction stage, many workers hired by the conductors and suppliers. The wages, salaries and other facilities of the third party hired workers not settled with the Company but settled with the relevant conductors and suppliers.

The project runs for 24 hours dividing 3 shifts 8 hours each. The monthly remuneration for the project is USD 0.08 million. There is no child labor and the project follows minimum wage policy prescribed by labor law of Bangladesh.

The present project worker strength is as under:

SL No	Designation	No.
1	Workers	143
2	Security	41
3	Cook	2
4	Operator	55
5	Administration Officer	39
6	Production Staff	50
Total		<u>330</u>

CHAPTER-5 PUBLIC CONSULTATION

The field survey team visited the Tosrifa Industries Limited at holding no. 121/1, Block –H, Word no-07, Beraiderchala, Sreepur, Gazipur, Bangladesh and its adjoining areas and collected the ideas of different types of stakeholders about both the adverse and beneficial impacts and its probable mitigation measures. More specifically, this was aimed at improving; the study taking into account, the opinions from the people of the impacted areas. Local community people of concerned areas were identified, contacted and gathered for public consultation meeting. The report included the lists of stakeholders; their name, address, profession, cell number and signature where available and signature sheet of public consultation (**Annexure XX and Annexure XXI**). The opinion of people that has been recorded during field study and survey are given below. Field Survey form is included in **Annexure-XXII**.



Figure 5.1: Stakeholder Consultations with local people and Upazila Level Government Officers

Survey Summary: The field visit team collected the information from local people as sample basis. The summary of the survey are as under:

- Meeting Date: 27 October 2017
- Meeting Venue: Beraiderchala, Sreepur, Gazipur
- 80% people know about the project, 20% do not know.
- 100% people ensured that there was no forest land in project area before project establishment.
- 100% people ensured that there was no agricultural land in project area before project establishment.
- 95% people think that the local people will be benefited from the project.
- Percentage of public opinion regarding potential impacts:

Potential Impacts	%
Traffic Problem	22%
Air Pollution	30%
Water Pollution	27%
Noise Pollution	22%
All	16%

- Percentage of public opinion regarding risk factors:

Risk Factors	%
Pollutions	38%
Fire Hazard	12%
Health Hazard	31%
All	13%

- Percentage of public opinion regarding opportunities from the project:

Opportunities	%
Job Opportunity	78%
Business Opportunity	52%
Social Development	56%

- Percentage of public opinion regarding demands from the project:

Demands	%
Pollution free environment	95%
Job preference for local people	80%
Road/Communication development	72%

The field visit team also meet the government officials of Rural Development Department, Statistics Department and Fisheries Department in Upazilla Office. The government discussed details to know about the project activities. After discussion they opined that this project will help the local community for their socio-economic development. They also advised to take necessary steps to manage the social and environmental impacts of the project.

Findings of Public Consultation

The findings of the public consultation are as under:

Issues Raised by Local Community	Company Views/Commitments
Damage of local roads for project activities	The company informed the local people that there are other industrial projects in area, so only this project is not only liable for road damage. But the company has plan to sit with other factories of the area that all can collective make a good solution to solve the problem.
Traffic congestion	It is assured in the meeting that the company will use its extra people to convey its vehicles to solve traffic congestion if made by this project.
Air pollution	The meeting informed the local people that use of clean fuel for generator will reduce the pollutant concentration in air emission. Proper and regular maintenance of generator will be done. There was a question regarding odor created from ETP. It was informed in the meeting that it will be Biological ETP so there will be no chance of health hazard. Odor Meter will be used to detect the problem and special boundary system will be made to mitigate this impact.
Water pollution	A state of the art Biological ETP and drainage system have been set-up in the project to manage the water treatment. There will be effective treatment of sewage wastewater streams by proper management.
Noise pollution	It was informed in the meeting that this project is established with modern noise free machinery. The company assured the local community that they will train the workers to follow the best ways in construction and operation regarding noise problem.
Job preference for local people	It was ensured in the meeting that the local people will get preference regarding job opportunities in this project.
Corporate Social Responsibility	It was requested by local people to donate in local mosque which was under construction. The company committed to donate a remarkable fund to build this mosque. According to discussions in the meeting, the company committed to the local community that it will participate in educational and social organizations in this community when need.
Labor Influx	It was informed in the meeting that general workers will be recruited from local people and there will need to recruit skilled workers from other areas which might create labor influx. These outside workers will accommodate in shelter camps of the project as much as possible and some will accommodate around the project. This type of labor influx will have some positive impacts on local community – as like house-rent income, increase of economic activities in locality, local market development. The company ensured that they will manage its own workers as well as workers hired by suppliers/conductors that they cannot create any kind of problem for local community.

The overall opinions of the participants which expressed during public consultation is positive toward construction and operation of the project. They welcome the project to be implemented as soon as possible.

CHAPTER-6

IDENTIFICATION, PREDICTION & EVALUATION OF POTENTIAL IMPACTS AND MITIGATION

6.1 General Consideration

This chapter deals with identification of key impacts, evaluate the impacts briefly and suggest mitigation measures. Checklist method is used for impact identification for both of the construction and operation-maintenance phase. Significance of impacts identified by x mark. Table 6.1 present checklist of potential impact associated with project location, construction and operation-maintenance phase. Relevant important aspects of environment are therefore selected which may have significant impacts due to project activities. Environmental parameters are broadly classified into three groups:

1. Physical Environment
2. Biological Environment
3. Socio-economic Environment

6.2 Scoping impacts

Key impacts indicate potential impacts that are unavoidable due to construction and operation of the project. Key impacts associated with the project are given below:

- ❖ Water Pollution
- ❖ Noise pollution
- ❖ Air emission
- ❖ Generation of solid waste
- ❖ Occupational health and safety risk
- ❖ Employment creation

6.2.1 Checklist of Potential Impact

The Checklist of potential Impact of Tosrifa Industries Limited is given in below table 6.1

Table 6.1: Checklist of Potential Impacts

Project Phase	Action Affecting Environmental Resources	SEIs without mitigation measures				Type		Comments
		None	Minor	Medium	Major	Adverse	Beneficial	
Location Selection	Land use value depreciation	×					×	Using for more productive purpose
	Loss of and displacement from homestead land	×						No displacement issue
	Loss of agricultural land	×						No agricultural Land loss. Because the land won by TIL and Presently used in industrial purpose
	Damage to nearby operation	×						No impact anticipated as no major installation
	Disruption to drainage pattern	×						No Impact
	Encroachment into precious ecology	×						No precious ecological issue
Construction Phase	Generation of dust				×	×		Dust generated by site clearing, civil works, cutting and filling of land
	Removal of top soil	×						Mud works, construction of internal road etc
	Soil erosion	×						Due to excavation and removal of top soil
	Siltation of nearby drainage or surface water body	×						Siltation may occur from pile up spoil soil
	Water pollution from construction waste materials disposal				×	×		Controlled disposal required
	Air emission from construction machineries operation				×	×		Unavoidable but for limited time
	Increase volume of local traffic			×		×		Medium impact will impose
	Extraction of groundwater		×					Supply from central source
	Noise generation from construction activities			×		×		Discontinuous noise
	Employment generation						×	Significant beneficial impact
	Occurrence of accidental event			×		×		Follow good housekeeping

Project Phase	Action Affecting Environmental Resources	SEIs without mitigation measures				Type		Comments
		None	Minor	Medium	Major	Adverse	Beneficial	
Operational Phase	Occurrence of disturbance to nearby community and resources	×						Activities will confine in its own premises so on impact
	Ambient air pollution from dust and gaseous emission				×	×		Impose impact on air quality, mitigation measure needed.
	Indoor air pollution from in house activities				×	×		Chemical vapor, VOC impact on health
	Surface water/ Ground water pollution from sewage disposal				×	×		Mitigation measures are required
	Surface water/ Ground water pollution from disposal of liquid effluent from any activities				×	×		water pollution, Mitigation measures are required
	Noise Generation				×	×		Indoor discontinuous noise impact on occupational health, mitigation measure needed
	Vibration from odor machine operation	×						Heavy machinery involvement absent
	Solid waste generation			×		×		Mitigation measures are required
	Employment generation	×					×	Good employment opportunity
	Occurrence of accidental event and Environmental health and safety issue			×		×		Source identification needed and mitigation measure needed
	Increase volume of local traffic		×					Insignificant impact on local traffic
	Immigration	×					×	Related with employment opportunity
	Odor hazard		×					Odor may be controlled by proper management of housekeeping
	Depreciation of environmental aesthetic	×						Landscape will enhance environmental aesthetic

6.3 Environmental Impacts Identification and Mitigation Measures

Chapter 3 (Project description) identified the major activities associated with project phases. Each phase of the project has the potential to impact on the physical, biological and socioeconomic environments of the project areas. This chapter assesses the potential impacts that may arise from various project activities and identifies suitable measures to mitigate or avoid the potential adverse impacts identified and, where possible, to enhance potential beneficial impacts. Tosrifa Industries Limited project is a Composite textile manufacturing factory where they use diesel fuel & Gas is to produce final output. In the process it liberates heat and combustion product such as gas and diesel like NO_x, SO_x, CO₂, CO, SPM and PM₁₀ and PM_{2.5} etc to surrounding atmosphere.

During operational activities it may have impact on the locality. The study was to identify these adverse impacts, and suggest mitigation measures to reduce these if not eliminated. Accordingly, an environmental baseline survey was conducted in the project areas to identify the environmental parameters likely to be affected by the project implementation. All the major environmental parameters covering ecological, physic-chemical and human interest related aspects were considered in identifying the affected areas at different stages of the project cycle. Summary Matrix of Predicted Impacts and Mitigation Measures are shown in Table 6.2.

Anticipated environmental impacts due to project location, construction and operation of the existing Composite textile manufacturing unit have been identified. It can be seen from the checklist that the major environmental components that will be adversely affected by the project activities are air quality, water quality and noise pollution.

Socioeconomic environment is considered to be affected positively of the project activities that had created job opportunities for the local people and the area has developed and commercial activities has increased in the locality. All these impacts have contributed to improve the quality of life of the local community. Mitigation measures of the adversely affected parameters are discussed in the subsequent sections.

Table 6.2: Summary Matrix of Predicted Impacts and Mitigation Measures during construction and operation

Sl. No.	Components	Potential Impacts	Potential Source Of Impact	Controls through EMP & Design	Impact Evaluation	Remedial Measures
01	Groundwater Quality	Ground water Contamination	Sewage disposal on land	Effluent sludge to be sent for Suitable disposal	Negative impact on ground water quality envisaged. Not significant	In an unlikely event of soil and groundwater contamination remediation measures shall be implemented.
02	Groundwater Quality	Ground Water Depletion	Water during the operation phase will be met partly from underground source and partly from recycled water.	Rain & Storm water collection and Holding it in the area. TIL already have the plan of Rain water Harvesting.	Significant impact on ground water quantity because withdrawal of entire water from the aquifer.	ITL will reuse the water for different purpose of the project. TIL Environmental Personnel will trained up the workers about reuse of water
03	Surface Water Quality	Surface water Contamination	If Discharge wastewater to surface water body.	Wastewater treatment scheme developed to treat the waste water so that it can be disposed to environment after proper treatment.	Significant impact on water quality because the facility have dyeing & washing activities.	Used ETP and In case of any event of Discharge of water from the site, the applicable water quality standards will be Maintained as per ECR 1997.
04	Air Quality	Dust Emissions like SPM, PM ₁₀ , SO _x , NO _x , CO ₂ , CO.	Vehicular movement within the TIL, Generator, Chemical handling and operation	Fuel efficient vehicles will be used and proper record of Vehicles will be maintained. Environmental parameter testing will be done periodically and measures will be taken in case of any adverse effect.	Long term significant negative Impact.	Maintain record of vehicles Exhausts from vehicles will be minimized by use of fuel-efficient vehicles. Air filter will be used in generators, masks will be provided to workers.

05	Noise Environment	Noise pollution	Noise from vehicles movement, generator, Boiler, Compressor etc.	Generator, Boiler, Compressor will be made sound proof.	Significant as nearest receptor would be at a distance of 20 m from the noisy area.	Ear plugs and Ear muff will be provided to the workers directly affected from the noise source.
06	Land Environment	Soil contamination	Dumping of liquid sludge, effluent, domestic waste on land.	Used a functional waste Management system for waste collection, segregation and Disposal.	Since waste is handled on the site, waste dumping would not be allowed. Not Significant.	The waste should be segregated and disposed as per the solid waste management procedure.
07	Socio-Economic Environment	No displacement	Site operation	Employees will be provided direct employment opportunities. In addition employment opportunities will be provided for persons engaged in operation and maintenance and allied activities.	Beneficial Impact	-
08	Odor Hazards	Odor Pollution	Odor may be generated in the work place due to poor house keeping	Odor may be controlled by proper management of housekeeping	No significant negative Impact.	Maintain good housekeeping Practices

6.4 Evaluation of Predicted Adverse Impacts & Mitigation Measures

Environmental impacts are identified and predicted for both positive and negative impacts in terms of ecological, physico-chemical and socioeconomic parameters. Evaluation of impacts and possible mitigation measures are described in this section mentioning the sources and characteristics of impacts. Status of residual impacts is also discussed.

6.4.1 Impact due to Project Location

It was earlier mentioned that Tosrifa Industries Limited at holding no. 121/1, Block –H, Word no-07, Beraiderchala, Sreepur, Gazipur, Bangladesh is located in their own land which was empty land previously. The site was fully vacant and then developed as required, no abundant structures has been demolished due to construction of the project. If the existing environmental situation is considered as baseline condition, there would be no significant adverse impacts due to project location.

6.4.2 Potential Impacts during Construction phase

A) Impacts on physical Environment

6.4.2.1 Air pollution Impact: Air quality is being affected due to emission of flue gases from the generator during construction. The existing project is using diesel generator. Diesel and gas burning from the operation of generator and boiler is affecting the air quality. The situation becomes aggravated when gas, chemicals, contains high percentage of impurities like sulfur, hydrocarbon, nitrogen etc.

Mitigation Measures:

- ❖ Project site is surrounded by boundary wall
- ❖ Access roads and exposed ground should be regularly wetted in a manner that effectively keeps down the dust.
- ❖ Stockpiles of fine materials should be wetted or covered with tarpaulin during windy conditions.
- ❖ Workers in the site should be issued with dust masks during Dry and windy conditions
- ❖ Use the catalytic converter for fuel burning machineries
- ❖ Vehicles and other machinery clear off mud before leaving the site
- ❖ Materials covered by tarpaulin while carrying in truck or used covered van.

6.4.2.2 Noise and vibration: Significant level of noise and vibration is being generated from the Generator, construction activities, and Different vehicle.

Mitigation Measures:

- ❖ Constructing activities that will generate disturbing sounds should be restricted to normal working hours.
- ❖ If required local residents should be given notice of intended noisy activities so as to reduce the degree of annoyances.
- ❖ Worker should use ear plug while working with noisy area.

6.4.2.3 Solid and Liquid waste generation: In construction time have some solid wastes some are hazardous and some are non-hazardous.

Mitigation Measures:

- Provided space for temporary disposal of solid waste on the site and dispose the wastes properly
- Used 3R Method for solid waste management
- Arrange adequate sanitary facilities for worker
- Monitor/follow up to ensure appropriate waste disposal and sanitation practice by contractor and construction workers.

B) Impact Mitigation on Biological Environment

The site is allocated for setting up industry so minimal impact anticipated on biodiversity.

Mitigation Measures:

- Avoid unnecessary cutting of trees
- Allocate space for greenbelt development
- Avoid noisy activities and keep limited illumination during right time

C) Impact Mitigation on socio-economic Environment

6.4.2.4 Employment

The project will generate employment, business opportunities in the form of labor, technical hand and materials suppliers etc. There is opportunity for temporary employment for the local people at construction works.

Mitigation Measures: N/A

6.4.2.5 Accident/exposure to health hazard

Accidental event may occur in construction phase.

Mitigation Measures:

- Create awareness on safety issue among workers and contractors.
- Monitor the practice of following safety guidelines by worker and contractor.
- Ensure use of appropriate PPE while working in the construction site.

6.4.3 Potential Impact during operational activities

6.4.3.1 Air pollution

Source of Impacts

Ambient air quality is being affected due to emission of flue gases from the generator. The existing project is using diesel generator. Diesel and gas burning from the operation of generator is affecting the air quality. The situation becomes aggravated when gas, chemicals, contains high percentage of impurities like sulfur, hydrocarbon, nitrogen etc.

The high temperature of flue gas also produces impacts on the air quality in terms of thermal pollution. The combustion of diesel for power generation inevitably results in emission of gaseous pollutants to the atmosphere.

Gaseous pollutants to the atmosphere

The major pollutants of potential concern are sulfur dioxide (SO₂), oxides of nitrogen (NO_x), carbon monoxide (CO), Carbon dioxide (CO₂) emissions cause greenhouse effect giving rise to global temperature.

Mitigation Measures

Use of clean fuel for generator can reduce the pollutant concentration in air emission. Proper and regular maintenance of generator should be done.

Residual Impacts

Residual impacts of air pollution can be reduced to a minimum level provided the suggested mitigation measures are undertaken and properly implemented.

6.4.3.2 Noise pollution

Significant level of noise and vibration is being generated from the Generator. “Noise and vibration” is an unwanted sound of an unacceptable intensity at a wrong time and wrong place. These pollutions are considered as one of the major dimensions that lead to the environmental degradation. These create psychological and physical effects on human health. It is difficult to assess and quantify the environmental degradation or discomfort caused by these nuisances. However, it includes auditory fatigue and reduces hearing capacity of the people working in the plant and living in the adjacent area. Noise levels depend on two major parameters – sound pressure and sound intensity. The following components of the existing unit are generating noise of various levels:

1. Generator
2. Boiler
3. Compressor
4. Some production area etc

Mitigation Measures

The noise level at the project should be reduced by putting baffle type silencers in exhaust duct to arrest noise due to flow of exhaust gases. The noise due to running of the machine will be arrested by acoustic enclosures. The generator & boiler rooms should be made sound proof by using canopy shield. Moreover, the operators of the generator & other production machineries should be provided with ear plugs & the use of the plugs should be ensured by managerial implementation.

It should be ensured that all generating equipment is noise suppressed. Tall trees are to be planted at the property line for noise attenuation particularly during operation stage. Plant foundation shall be designed to minimize vibration effect.

Residual Impacts

Residual impacts of noise pollution and vibration can be reduced to a minimum level provided the suggested mitigation measures are undertaken and properly implemented.

6.4.3.3 Water pollution

Water is a vital element for our daily activities. That is why water quality is a principal environmental concern and therefore, understanding the consumption, source and characteristics of the wastewater and selection of adequate treatment options are crucial from the management viewpoint. The main source of water pollution of TIL is dyeing, washing, Domestic and sewerage water.

Mitigation Measures

Most of the measures that is required to minimize impacts of wastewater includes the following-

- ✚ Installed ETP to treat waste water
- ✚ Limiting overall water consumption
- ✚ Effective treatment of sewage wastewater streams by proper management
- ✚ Regular monitoring of surface water quality
- ✚ Installation of rainwater harvesting system at least of the office buildings.
- ✚ Reuse of process water if found viable
- ✚ Adopt zero discharge schemes if found feasible.

6.4.3.4 Impact due to Solid Waste Generation

Significant amount of solid waste are generated from factory, which included empty Chemical drums/containers, Chemicals Dram, Sludge, kitchen/canteen wastes etc. If this solid waste is not managed properly it can impose great danger to the environment & community, which are:

- ✚ Poorly disposed waste fabrics, waste paper & especially plastic waste can block drainage;
- ✚ Empty chemical drums & containers if not disposed properly can pollute solid & water of the receiving environment;
- ✚ Odor emanating from degradable waste especially kitchen waste can pollute local ambient air;
- ✚ Poorly managed and disposed kitchen waste can attract diseases vectors;
- ✚ Decomposing kitchen waste can pollute local ambient condition;
- ✚ Poorly managed electrical, mechanical and chemical wastes can pollute soil, water and air.

Mitigation Measures

Solid waste needs proper handling, transportation and disposal. Disposal of solid wastes should be of the sanitary land filling type among others, which does not pose hazards to ground water pollution in any case. Container containing chemical and other chemicals of possible harmful nature may be sold to DoE approved vendors or after proper washing should be disposed of in an environment friendly manner.

The following mitigation options are generally recommended for solid waste management:

- ✚ Solid waste to be handled, managed and disposed according to the waste management regulations;

- ✚ Waste handling bin to be provided, each bin should have a lid which should always be covered;
- ✚ Color code to be used to distinguished Waste bins of different waste;
- ✚ Waste to be sorted at source;
- ✚ All scrap metal and wood to put in a designated handling area which should be away from active areas, the area should also be marked and labeled appropriately and preferably have some form of enclosure;
- ✚ Paving of unpaved areas, regular sprinkling of water on dusty areas and regular sweeping of fine particles from paved areas can address the issue of dust and fine particles emanating from paved and unpaved areas within the facility;
- ✚ Daily disposal of food based waste before decomposition and production of odor;
- ✚ Plastic waste should be collected and handled separately in closed waste receptacles;
- ✚ Prompt maintenance of sewer line, appropriate location of soakage pits away from boreholes will avoid contamination of ground water resources;
- ✚ There should be no scattering of waste during transportation disposal to disposal site.

Existing management Practices

TIL will have sufficient numbers of cleaners who regularly cleans and collects solid wastes generated in the complex. Sufficient numbers of dustbins has been put in the place. In case of harmful waste the amount is very negligible and collected and stored in store room. The items having resale value is generally sold out to DoE approved small vendors.

6.4.3.5 Impacts on Health and Safety, Natural & Accidental Incidents

There might be hazards to plant workers, Operators, employee and technical personnel from working at the Floor level, utility sections, and store rooms. Provision need to be made by the project for protecting Occupational health, including protection of worker from hazards, fires etc. as well as protection of worker health and assurance of safe drinking water supply and sanitation.

In the finishing generally involves handling of a diverse variety of chemicals, many of which are flammable, toxic and corrosive in nature. The risk probability in Composite textile units can be broadly categorized as:

- ✚ Chemical risks
- ✚ Process risks
- ✚ Fire and explosion risks
- ✚ Electrical-associated risks, and
- ✚ Occupational risks

Mitigation Measures

Chemical Storage and Management

- ✚ In case of chemical storage, proper segregation scheme should be strictly followed.
- ✚ Designated storage area with spill collection system.

- ✚ Layout of the plant is important from environment and safety point of view, location of chemical storage sections should be proper & in line with the emergency management planned.
- ✚ Hazardous chemicals (such as potential to cause cancer) should be stored in closed loop.
- ✚ The qualification and addition of chemical should be computerized.
- ✚ There should be restricted entry into the chemical storage area; proper signage for restricted entry should be put in place.
- ✚ Operator involved in handling of chemical should be trained.
- ✚ Road should be wide enough to support free movement of vehicles.
- ✚ Container should have good valves with tight stopping devices to avoid spilling or dripping of hazardous chemicals.
- ✚ Storage containers should have legible signs indicating the contents of the container, health hazard warning (where necessary), and spill clean-up procedures in case
- ✚ Secondary containment should be properly provided.

Occupational Health and Safety

- ✚ The layout of the project should be such that the high-risk zone (such as production, storage of chemicals/products, incinerators etc.) are separated from the low-risk zones (such as administration, laboratories, canteen etc.). Green belt development shall be at the periphery and not within the plant area- the plant area should have an open lawn.
- ✚ Road inside the plan area should be broad and spacious so that fire bridges can operate smoothly. All high risk zones must be easily accessible.
- ✚ Hazard and risk-prone area should be identified and characterized by conducting risk assessment.
- ✚ On-site and off-site risk disaster management plans, based on impact magnitude and its severity, need to be prepared.
- ✚ Pre job risk assessment must be done for new and hazardous work. This should be also followed by work permits specifying risks, management option and persons responsible to take corrective actions.
- ✚ Personal protective equipment (hand gloves, safety goggles, nose masks and helmets) to be provided to all the employees working in the plant.
- ✚ Training for employees to educate them about the hazardous nature of chemicals used in the process.
- ✚ Supervision of high risk jobs should be ensured.
- ✚ There should be provision for delegation of supervision to ensure more safety.
- ✚ Workers can be rotated within jobs so that they not face continuous noise exposure for a long period of time.
- ✚ Trained medical personnel and first aid facilities as well as safety equipment such as fire extinguisher and fire alarms to be made available at place of work.
- ✚ Medical examinations to be conducted for the workers from time to time. If significant occupational health problems are observed, the management should take appropriate measures.
- ✚ Identification and implementation of management procedures including process safety, training, management of change, incident investigation, employee participation, contractor training and oversight.

- ✚ Developing and implementing an emergency response procedures, emergency equipment, training, review and updates.

6.4.4 Impact on Indigenous People

No indigenous or tribal people were observed in the project area and therefore World Bank OP 4.10 will not be triggered.

6.4.5 Impact Due to Land Acquisition

Tosrifa Industries Limited has constructed their buildings on their own land. No Land acquisition is required. therefore World Bank OP-4.12 will not be triggered. So there should be no impact on the baseline condition.

6.4.6 Ecological Impact

Based on assessment of the baseline environment at different project locations (during field visits) and the nature and scale of the proposed project, it appears that ecological impacts are not likely to be significant.

6.4.7 Impacts due to Labor Influx

For projects required labor force and associated goods and services cannot be fully supplied locally for a number of reasons, among them worker unavailability and lack of technical skills and capacity. In such cases, the labor force (total or partial) needs to be brought in from outside the project area. In many cases, this influx is compounded by an influx of other people (“followers”) who follow the incoming workforce with the aim of selling them goods and services, or in pursuit of job or business opportunities. The rapid migration to and settlement of workers and followers in the project area is called labor influx, and under certain conditions, it can affect project areas negatively in terms of public infrastructure, utilities, housing, sustainable resource management and social dynamics.

Potential Impacts of Labor Influx:

- Adverse social and environmental impacts on local communities;
- Increased demand and competition for local social and health services;
- Increased volume of traffic and higher risk of accidents;
- Increased demands on the ecosystem and natural resources;
- Increased risk of spread of communicable diseases;
- Increased rates of illicit behavior and crimes;
- Sexual hazards caused by migrated workers.

Mitigation Measures:

- Arrangement of labor camps as much as possible that the migrated workers have less impacts in the locality.
- Ensure better living standard of the migrated workers.
- Arrangement of training for migrated regarding impacts of labor influx.
- Recruit as much as possible from local community.
- Strong agreement arrangements with conductors and suppliers that they can manage their workers in such a way that they will not cause any hampers for local people.

6.4.8 Positive impact of the proposed project

Interview with the management and the workers reveals the results of the survey with regard to the impact of the existing project. Almost all the respondents provided positive answers regarding the operation of the project. These people showed their response by stating that they are ready to cooperate with Tosrifa Industries Limited for continuation of the project. Overall impact of the project is positive. It has created a lot of job opportunities for the surrounding people especially for the women. The life standard of these employees has increased because of the project operation. Positive impact has been resulted from implementation of the project which includes:-

-  Creation of jobs;
-  Support of local business;
-  Flourish the local economic activities;
-  Infrastructure development;
-  Revenue of Local Municipal Council; and
-  Gains to the economy.

CHAPTER-7

ENVIRONMENTAL & SOCIAL MANAGEMENT PLAN

7.1 General Consideration

The Environmental and Social Management Plan (ESMP) is concerning with the implementation of the measures necessary to minimize or offset adverse impact and to enhance beneficial impacts. The prime function cannot be achieved unless the mitigation and benefit enhancement measures, identified in study are fully implemented. All measures are said to be successful when they comply with the Environmental Quality Standard (EQS) of Bangladesh. Thus the objectives of ESMP of studied industrial projects would be:

- ✚ Mitigation measures to reduce and eliminate negative impacts
- ✚ Enhancement measures to maximize positive impacts
- ✚ Monitoring requirement and monitoring indicators
- ✚ Costing for ESMP implementation

7.2 Overview of the Project

Tostrfa Industries Limited is a sister concern of Northern Tosrifa Group is going to establish a LEED certified dyeing project with capacity of 28 MT dyeing per day.

7.3 Environmental and Social Impact Management Action Plan

Environmental Impact Management Action Plan is also called impact mitigation plan covers all environmental aspects which is the key to ensure that the environmental qualities of the area may not deteriorate due to the operation of the project. Implementation of the mitigation plan is the most important task of ESMP.

The main benefits of the impacts mitigation plan are:

- ❖ Ensuring that environmental standards are met at operational phases of the project
- ❖ Providing offsets to negate project impacts especially ecological impacts, e.g., in the form of compensatory afforestation, greenbelt development and landscaping.
- ❖ Complying with existing regulations with implementation of least cost basis mitigation measures

An implementation task list is formed and the important mitigation measures are included there with time frame, assigning responsibility and approximate cost in Table 6.1 and Table 6.2 for construction and operation period accordingly. Here implementation responsibility belongs to project proponent but the project proponent may assign a representative on behalf.

Table 7.1: Environmental and Social Management Action plan for Construction Phases

Impacts	Mitigation measures	Time frame	Location	Responsibility
Air pollution	- Surrounded project site by boundary wall - Access roads and exposed ground should be regularly wetted in a manner that effectively keeps down the dust - Stockpiles of fine materials should be wetted or covered with tarpaulin during windy conditions - Use of catalytic converter for fuel burning machineries - Vehicle and other machinery clear off mud before leaving the site - Materials covered by tarpaulin while carrying in truck or used covered van	Throughout construction phase	Project site	Representative of project proponent
Noise and Vibration	- Construction activities that will generate disturbing sounds should be restricted to normal working hours - If required local residents should be given noticed of indeed noise activities so as to reduce the degree of annoyances - Worker use ear plug while working with noisy device.	Throughout construction phase	Project site	Representative of project proponent
Impact on Ground Water	- Ensure minimum extraction of ground water - Wastage of water should be avoided through monitoring - Develop rain water harvesting system - Reuse of water - Harvested Rainwater	Throughout construction phase	Project site	Representative of project proponent
Solid and Liquid waste generation	- Provide space for temporary disposal of solid waste in the site and dispose the waste properly. - Arrange adequate sanitation facility for workers - Follow up to ensure appropriate waste disposal and sanitation practice by contractor and construction workers.	Throughout construction phase	Project site	Representative of project proponent
Impact on Biodiversity	- Avoid Unnecessary cutting of Trees - Allocate space for Green belt Development - Avoid noisy activities and keep limited light level during night time	Throughout construction phase	Project site	Representative of project proponent

Impact on Traffic Volume	Control Vehicle movement in organized way and follow local traffic instruction	Throughout construction phase	Material Transport route	Driver
Fire/ Explosion	- Establish own firefighting system and maintain collaboration with government firefighting and civil defense department locally - Organize fire drill and training for construction staffs.	Throughout construction phase	Project site	Representative of project proponent
Employment Generation	N/A	Throughout construction phase	Project site	Representative of project proponent
Occupational Health and safety Risk	- Create awareness on safety issue among workers and contractors - Monitoring the practice of following safety guidelines by workers and contractor - Ensure use of appropriate PPE while working in the construction site and display proper safety sign in the project site - Electrical Equipment/ wires should be properly maintained during construction	Throughout construction phase	Project site	Representative of project proponent
Impact on Labor Influx	- TIL authority has constructed temporary labor shelter for migrated workers. - Recruit workers as much as possible from local community. - TIL has contact agreement with migrated labors for control their behaviors and movements in the local community. - They have some policy and procedure to control the movements of migrated workers with local people. - Arrangement of training facilities for workers regarding labor influx issues.	Throughout construction phase	Around Project Site	Representative of project proponent

Table 7.2: Environmental and Social Management Action plan for Operational Phases

Impacts	Mitigation measures	Time frame	Location	Responsibility
Water pollution	▪ Cooling Water ▪ Septic tank and soak pit for sewage discharge. ▪ Maintain cleanliness of production floor and yard ▪ Proper maintenance and continuation of ETP. Waste water is treated before discharged to natural water	Throughout operation phase	Project site	Representative of project proponent
Sludge Management	▪ Sludge will be managed as per DoE Sludge Management Guidelines and detailed action to be taken after operating the ETP. ▪ Some parameter of the sludge will be test after project operation	Throughout operation phase	Project site	Representative of project proponent
Generation of Solid waste	▪ Apply 3R method for waste management of the project. ▪ Trained employees on waste control and disposal procedures. ▪ Segregates wastes at source and store in demarcated place. ▪ Use separate demarcated bin for kitchen and office waste and develop waste disposal system. ▪ Scrap metal, packing materials, plastic, can etc. sale to scrap dealer ▪ Spent lube sell to DoE approved vendor only.	Throughout operation phase	Project site	Representative of project proponent
Noise and Vibration	▪ Air plug will be provided to worker while near to noise generating equipments or working in noise area. ▪ Arrangement for separate generator and compressor room with canopy wall or install canopy shield for generators. ▪ Procure and use low noise generating machineries. ▪ Regulation of vehicle movement ▪ Conduct periodic maintenance of equipment, replace worn out parts lubricate rotating parts. ▪ Install stock absorber, damper/isolator (where necessary). ▪ Will procure noise monitoring device and monitor noise condition in and outside the project premises.	Throughout operation phase	Project site	Representative of project proponent
Air Pollution	▪ Provide adequate ventilation and exhaust fan in the workplace. ▪ Spry water on bare soil. ▪ Maintain open air exhaust for generator and set catalytic converter and faulty engine would be repair as soon as possible. ▪ Regulate movement/speed of vehicle.	Throughout operation phase	Project site	Representative of project proponent

	- Plant tree with dense canopy on boundary line - Use low VOC chemicals			
Impact on Soil or Land	- Trained employee on spillage control - If oil and chemical mixed top soil then separate top soil, store and dispose properly - Maintain cleanliness of the yard and store solid waste in waste bin. - Green belt Development for enhancing natural aesthetic of the site	Throughout operation phase	Project site	Representative of project proponent
Impact on Traffic Volume	Control vehicle movement in organized way and follow local traffic instruction	Throughout operation phase	Project site	Representative of project proponent
Fire/ Explosion	- Establish own firefighting system and maintain collaboration with government firefighting and civil defense department locally - Organize fire drill and training for construction staffs.	Throughout operation phase	Project site	Representative of project proponent
Occupational Health and safety Risk	- Use of Personal Protective equipment such as Hard helmet, Musk, Boot, Eye glass etc. - Will formulate health safety measures and ensure use of safety devices - Aware and train employees on using safety devices	Throughout operation phase	Project site	Representative of project proponent
Impact on Labor	To mitigate labor impact of the project, TIL will have a plan some certification on Social and Environmental issue like BSCI, SADEX, WARP, OHSAS 18001 for worker safety, minimum wage, working condition, health and safety, environmental Management etc. To earn theses certifications after proper audit and checkings, the project needs to ensure to meet-up the required compliances regarding labor working conditions. So these kinds of certifications will help the project to mitigate negative impacts on labors.	Throughout operation phase	Project site	Representative of project proponent

7.4 Environmental Monitoring Programmers

7.4.1 Monitoring Requirement

Environmental Monitoring is an essential tool in relation to environmental management as it provides the basic information for rational management decisions. The prime objectives of monitoring are-

- To check on whether mitigation and benefit enhancement measures are actually being adopted and are providing effective in practice.
- To provide a means whereby impacts which were subjected to uncertainty at the time of preparation of EMP, 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 project in future.

There are two basic forms of monitoring:

- ❖ Visual observation or checking, couple with inquiries
- ❖ Physical measurement of selected parameters

In this case projects in general, monitoring is done by physical measurement of some selected parameters like air, water, noise etc. Some Picture of the ESIA Study and monitoring are included in **Annexure- XXIII**. It should be mentioned here that the monitoring program should be such so that it can ensure compliance with national environmental regulations and standards. The importance of this monitoring program is also for ensuring that the project does not create adverse environmental changes in the area and providing a database of operations and maintenance, which can be utilized if, unwarranted complaints are made. Tostrfa Industries Limited will require that regular monitoring of possible change in environmental parameters to be undertaken during the operational life of the project.

7.4.2 Monitoring Indicators

Keeping in mind the pollution factors, there will be a need to put in place elaborate and sound environmental management system and mechanisms of monitoring on a continuous basis. Undertaking monitoring and auditing of key environmental parameters and putting in place of all approved recommendation of the environmental management plan and conditions of the license will achieve this.

7.4.3 Monitoring Parameters

Environmental Monitoring requires a set of indicators that could be conveniently measured, assess and evaluate periodically to establish trends of impacts. The indicators may be independent or may be functionally related. The monitoring program, in view of the possible impacts as assess earlier, should consider the indicators for the impact assessment related to following issues as presented in the tables in the following pages. Monitoring will involve

measuring, observing, recording and evaluation of physical, socio-economic and ecological variables within the project area and the neighborhood.

It is important for the facility management to set up regular monitoring programs to assess parameters of the environment as stipulated ECR 1997 and Bangladesh Noise Pollution control Rules 2006. This monitoring program will help to identify changes in the environmental situations giving opportunities for adopting appropriate control measures. A comprehensive checklist must be developed for operational usage. The basic activities for a sound-monitoring program should be least include:

- ❖ Collection and analysis of relevant environment data of the project area;
- ❖ Preparation of proper noise monitoring program; and
- ❖ Dust monitoring program
- ❖ Proper Risk Assessment programs.

Environmental and Social Monitoring Plan during Construction and Operation are given below in table 7.3 and 7.4 accordingly.

Table 7.3: Environmental and Social Monitoring Plan (ESMP) during Project Construction

	Activity	What parameter is to be monitored?	Where is the parameter to be monitored?	Frequency of monitoring as suggested in the EMP	Responsibility
1	Noise Pollution and Vibration	Sound pressure and sound intensity	Different Construction area and Inside the project	- Sound level is monitored by a Sound level meter in different noisy area. - During Construction area where the noise is exceed the standard use PPE for worker safety.	<u>Implementing:</u> Tosrifa Industries Limited <u>Supervising/Monitoring:</u> Project Environment Consultant-Global Sustainable Certification Services Ltd. (GSCS) and Environmental Personnel of TIL
2	Ambient air quality	SPM, PM10 SO ₂ , NO _x , CO		- Ambient air quality to be monitored by Respireable Dust Sampler with attachment - During Construction where the area is exceeding the standard of air quality, use PPE for worker safety, especially musk.	<u>Implementing:</u> Tosrifa Industries Limited <u>Supervising/Monitoring:</u> Project Environment Consultant-Global Sustainable Certification Services Ltd. (GSCS) , Environmental Personnel of TIL
3	Drinking water quality	pH, Color, Ammonia-Nitrate, Phosphate, Arsenic, Fecal Coliform, Manganese, TDS, Total Hardness	Drinking water	- Checking water for acceptable levels of parameters according to DoE and World Bank Standard from - Drinking water should test from BUET	<u>Implementing:</u> Tosrifa Industries Limited <u>Supervising/Monitoring:</u> Project Environment Consultant-Global Sustainable Certification Services Ltd. (GSCS) & Environmental Personnel of TIL

		Iron, Chloride Turbidity, etc			
4	Surface Water Quality	pH, Color, Turbidity, Cl, DO, BOD ₅ COD, TDS, TSS, EC, Ammonia- Nitrogen (NH ₃ -N) etc	Surface Water	Few Surface water Parameter to be monitor from GECL environmental laboratory.	<u>Implementing:</u> Tosrifa Industries Limited <u>Supervising/Monitoring:</u> Project Environment Consultant- Global Sustainable Certification Services Ltd. (GSCS) & Environmental Personnel of TIL
5	Solid Waste	All the wastage during construction	Inside the project area	- Training the workers on how to control and minimize the waste - Segregates wastes at source and store in demarcated place. - Solid waste to be handled, managed and disposed according to the waste management regulations;	<u>Implementing:</u> Tosrifa Industries Limited <u>Supervising/Monitoring:</u> Project Environment Consultant- Global Sustainable Certification Services Ltd. (GSCS) , Environmental Personnel of TIL
6	Occupational Health and safety Risk	During construction	Inside the project area	- Ensuring every worker wearing safety equipments such as hard helmet, Musk, Boot, Eye glass, apron etc. - All the fire extinguisher kept up to date and refill as per schedule.	<u>Implementing:</u> Tosrifa Industries Limited <u>Supervising/Monitoring:</u> Project Environment Consultant- Global Sustainable Certification Services Ltd. (GSCS) , Environmental Personnel of TIL
7	Social Impact monitoring on Labor Influx	During construction	Outside the project area	- Monitoring of labor condition - Recruit local labor as much as possible instead of influx labor - Monitoring of health and safety issue - Monitoring of different trainings for worker	<u>Implementing:</u> Tosrifa Industries Limited

Table 7.4: Environmental and Social Monitoring Plan (ESMP) during Project Operation

	Activity	What parameter is to be monitored?	Where is the parameter to be monitored?	Frequency of monitoring as suggested in the EMP	When is the parameter to be monitored?	Responsibility
1	Noise Pollution and Vibration	Sound pressure and sound intensity	Generator , Compressor and boiler room/area, different production area	- Sound level is monitored by a Sound level meter in different noise area. - According to intensity of sound ensuring that workers are using ear plugs especially in and near the generator and boiler area/rooms. - Regular maintenance of baffle type silencers in exhaust duct to arrest noise	Half yearly	<u>Implementing:</u> Tosrifa Industries Limited <u>Supervising/Monitoring:</u> Project Environment Consultant- Global Sustainable Certification Services Ltd. (GSCS) and Environmental Personnel of TIL
2	Ambient air quality/ Stack air emission	SPM, PM10, SO ₂ , NO _x , CO, CO ₂ , O ₂	Different Production area, Generator and boiler	- Stack Air Emission will be monitored by Testo-340 Flue Gas analyzer and Ambient air quality to be monitored by Respirable Dust Sampler with attachment - Checking diesel and gas emissions concentration of pollutants - Ensuring use of natural gas instead of diesel and clean diesel to be used - Proper maintenance of generators and boilers from time to time.	Annually	<u>Implementing:</u> Tosrifa Industries Limited <u>Supervising/Monitoring:</u> Project Environment Consultant- Global Sustainable Certification Services Ltd. (GSCS) , Environmental Personnel of TIL
3	Drinking water quality	pH, Color, Ammonia-	Drinking water	- Checking water for acceptable levels of parameters according to DoE and	Annually	<u>Implementing:</u> Tosrifa Industries Limited

		Nitrate, Phosphate, Arsenic, Fecal Coliform, Manganese, TDS, Total Hardness Iron, Chloride Turbidity, etc		World Bank Standard.		<u>Supervising/Monitoring:</u> Project Environment Consultant- Global Sustainable Certification Services Ltd. (GSCS) & Environmental Personnel of TIL
4	Waste Water Quality	pH, DO, BOD5, COD, TDS, TSS EC etc	Effluent Water	Checking waste water for acceptable levels of parameters according to DoE and World Bank Standard - Installed Flow Meter in the Inlet and out let of ETP	Every 3 months later	<u>Implementing:</u> Tosrifa Industries Limited <u>Supervising/Monitoring:</u> Project Environment Consultant- Global Sustainable Certification Services Ltd. (GSCS) & Environmental Personnel of TIL
5	Sludge Management	Monitor different parameter of sludge as per DoE Sludge Management Guidelines	ETP Sludge	- Sludge should be managed as per DoE Sludge Management Guidelines	As per requirements of DoE Sludge Management Guidelines	<u>Implementing:</u> Tosrifa Industries Limited <u>Supervising/Monitoring:</u> Project Environment Consultant- Global Sustainable Certification Services Ltd. (GSCS) & Environmental Personnel of TIL
6	Solid Waste	All the wastage during operation	Inside the project area	- Training the workers on how to control and minimize the waste - Segregates wastes at source and store	Monthly	<u>Implementing:</u> Tosrifa Industries Limited &

				in demarcated place. - Solid waste to be handled, managed and disposed according to the waste management regulations;		Environmental Personnel of TIL
7	Occupational Health and safety Risk	During operation	Inside the project area	- Ensuring every worker wearing safety equipments such as hard helmet, Musk, Boot, Eye glass, apron etc. - All the fire extinguisher kept up to date and refill as per schedule. - Record of Fire Drill	During operation period	<u>Implementing:</u> Tosrifa Industries Limited & Environmental Personnel of TIL
8	Impact on worker or labor	During operation	Inside the project area	- For worker security TIL will maintain different social standard like BSCI, SADEX, WARP, OSHAS 18001 and Labor Law 2006 and Labor Rules 2015 and World Bang Guidelines	During operation period	<u>Implementing:</u> Tosrifa Industries Limited

7.5 Environment and Social Management Plan (ESMP)

The purpose of the ESMP is to ensure that social and environmental impacts, risks and liabilities identified during the ESIA process are effectively managed during the construction, operation and closure of the proposed project. The ESMP specifies the mitigation and management measures to which the Proponent is committed and shows how the Project will mobilize organizational capacity and resources to implement these measures. The ESMP also shows how mitigation and management measures will be scheduled in **Table 7.1 and 7.2**. The key objectives of the ESMP are to:

- Formalize and disclose the program for environmental and social management; and
- Provide a framework for the implementation of environmental and social management initiatives.

Best practice principles require that every reasonable effort is made to reduce and preferably to prevent negative impacts while enhancing the benefits. These principles have guided the ESIA process. In many cases, potential negative impacts have been avoided through careful design and location of facilities. Potential impact associated with the operation of the existing facilities has been identified in the previous sections.

External Monitoring of ESMP: The project is in process to achieve LEED Certification. For achieving compliance standards the project will go through periodical certifications for environmental, health, safety and social issues. In the process of these certifications, there will be audit, checking and assessments before certifications and monitoring after certifications. Moreover, the buyers also perform various audits in compliance issues of working environment regularly. These will help the project to practice the ESMP in better way.

After execution of the project and start of commercial operation at full phase, the project has plan to arrange external monitoring of the ESMP implementation of the project after every six months.

7.6 Environmental and Social Monitoring Cost

Environmental and Social Monitoring requires a set of indicators that could be conveniently measured, assess and evaluate periodically to establish trends of impacts.

A comprehensive checklist must be developed for operational usage. The basic activities for a sound-monitoring program should be least include:

- ❖ Collection and analysis of relevant environment data of the project area;
- ❖ Preparation of proper effluent monitoring program; and
- ❖ Proper Risk Assessment programs.

Table 7.5: Environmental Monitoring Cost

SI No.	Sector of Monitoring	Cost (Taka)
1	ETP Implementation and Operation Cost	6,50,00,000.00
2	Environmental Monitoring Cost	20,00,000.00
3	Solid Waste Management Cost	35,00,000.00
4	Occupational Health and Safety related cost	10,00,000.00
5	Tree Plantation Cost and Environmental Friendly Decorations cost	42,00,000.00

7.7 Institutional Arrangements

TIL shall develop an EHS management cell namely, environmental health and safety Management cell in order to manage all environmental and safety related activities on the Project site. This cell will may be headed by a Manager Environmental Compliance along with supporting staff and their related background. The company organogram are included in **Annexure XXIV**. TIL shall develop an ETP laboratory during operation of the project. With the existing manpower TIL could easily form environmental management cell. Each individual will have his responsibility and together the cell will perform the following functions:

- ❖ Identification of Environmental and Social Management Needs.
- ❖ Prioritize development and monitoring needs.
- ❖ Develop management, implementation and monitoring plans according to the needs.
- ❖ Budget allocation and timely implementation of management actions.
- ❖ Continued monitoring and assessment of Environmental parameters.
- ❖ To work for continuous & regular improvement in environmental performance.
- ❖ To ensure systematic and routine housekeeping to reduce generation of pollutants inside the plant core area.
- ❖ To develop & maintain green belt and plant nurseries.
- ❖ To keep close liaison with environmental regulating authorities.
- ❖ To conduct monthly, quarterly and yearly monitoring and submit statements

7.8 Information and disclosure

Environmental and social Impact Assessment (ESIA) monitoring report of Tosrifa Industries Limited will be shared with Bangladesh bank on a quarterly basis. The ESIA report of TIL will be disclosed in the website of TIL and Bangladesh Bank.

7.9 Statement of Grievance Redress Policy, Procedure and Mechanism

The purpose of this statement is to define the procedure for managing stakeholder concerns and complaints (referred to as “grievances”) in a planned, timely, and respectful manner.

This grievance mechanism helps **Tosrifa Industries Limited (TIL)** fulfill the requirements of:

- Environmental and Social Impact Assessment (ESIA) process
- Operational Excellence Management System (OEMS)
- Human Rights Policy
- Labor Law, 2006
- Labor Rules, 2015
- Bangladesh Environment Conservation Act, 1995
- Periodical Public Consultation Meeting Minutes held at project

This grievance mechanism also ensures TIL alignment with best practices in stakeholders engagement.

Internal Grievance Mechanism

Internal Grievance Mechanism will be applicable for all TIL workers and staff members (Internal Stakeholders) working at fabric project.

External Grievance Mechanism

External Grievance Mechanism will be applicable for all external stakeholders of the fabric project including the local government, contractors or other community members, wherever operations might impact people.

7.9.1 Internal Grievance Mechanism

Tosrifa Industries Limited will be always careful about its workers complaint in an utmost care. The management will always keep in mind towards receive any complaint and find an appropriate solution to make a harmonious relationship between labor and management. In this case, countries existing labor Act and organization own policy will be followed properly.

In the respective project there will be a Workers Participatory Committee (WPC) to avoid any mishandling and deprivation of workers and employee. There will be a meeting of WPC every month to discuss about the working environment and future development of workers and employees. Complaint boxes will be kept in toilets that workers can submit their complaints in secrecy. After every meeting the complaint boxes will be opened in front of the Internal Grievance Committee and the committee will take the proper steps after investigations and analysis. The Internal Grievance Committee will be formed as under:

1. 2 (two) members from Workers Participatory Committee
2. Project Head
3. Head of Human Resource

7.9.2 External Grievance Mechanism

TIL will administer the external grievance mechanism by providing resources to handle correspondence, manage a log, and report to deal with the external stakeholders of the project in need. There will be created an External Grievance Committee, the complaints or any other issues related to external grievance will be submitted to this committee. After discussion with the relevant external stakeholders the committee will take proper measures to solve the issues raised by external stakeholders. The External Grievance Committee will be formed as under:

1. Project Head
2. Head of Admin
3. Compliance Manager
4. Ward Councilor
5. One teacher from local school
6. Imam of local mosque
7. One member from local community

CHAPTER- 8

RISK MANAGEMENT AND DISASTER MANAGEMENT PLAN

8.0 General Consideration

This study has been carried out to identify the potential hazard and risks associated with the different phases of the project, possible measures to avoid these hazards and hence provide with the safety plan for minimizing the risk. A cause and consequence analysis has been carried out to identify the root cause of such hazards and potential consequences.

8.1 Hazard categorization and potential hazard points

The potential hazards associated with the construction and functioning of the proposed Tosrifa Industries Limited have been screened and categorized based on some preliminary assessments. The potential hazard points are listed in Tables 8.1 below.

Table 8.1: Potential hazard points possessed in proposed project

Hazard Category	Hazards Points
Mechanical	Machineries which will be used during construction work
Electrical	Electrical works which will be done during construction work
Fire and Explosion	Gas pipe line, Production process during operation

8.2 Consequence analysis

The potential hazards, root causes and the consequences were identified through hazard assessment. Moreover, specific safety measures were identified for each of the identified hazards. Given the scope of this study, the findings of the hazard assessment with suggested safety plans are presented in Table 8.2 below.

Table 8.2: Hazard assessment for the proposed project

Hazard point	Use	Potential Hazard	Root Causes	Consequence	Suggested Safety measures
Machinery and equipment	Site clearance activities	Accident	Unconsciousness, Mechanical failure.	Health injury, life loss	Regular inspection and maintenance
Construction					
High Heights	Construction of building, steel structure and its foundation, painting works, drilling work, etc	Fall during works	Unconsciousness, Equipment failure.	Health injury, life loss	Fall protection, awareness
Motor vehicle	Transportation	Noise, accident	Noise from engine running, tire friction, hydraulic		Traffic safety measures, regular

			Horn, unconsciousness.		checking, servicing and maintenance of vehicle, awareness
Cutting and welding	For construction purpose	Burning, electrocution	Electric failure, lack of training, exposure to workers and Passerby.	Eye injury, health injury	Proper training, PPE, awareness, warning signal for passerby and adoption of welding standard Practice.
Operation					
Gas pipe line	Transports the gas efficiently over long distance	Fire hazard	Improper connection, lack Of awareness.	Health injury, loss of life, loss of Environmental quality & damage of equipment	Regular inspection. Installation of fire defense and fighting systems.
Generator		Noise pollution	Generator not covered by canopy		Regular inspection, continuous Monitoring.
Production process	Use many chemical in the production process	Chemical hazard	Chemical spilled and misuse, accidental release	Health injury, Loss of life, degradation of air, water and soil quality	Chemical use safety, Limited entry, use of PPE, safety shower, eye wash and first aid facilities

8.3 Hazard and Risk Management Plan

Hazard and Risk Management Plans are developed to address a range of probable hazard scenarios, emphasizing the tasks required to respond to a physical event. These plans have been developed listing various actions to be performed in a very short period of time in a predetermined sequence if it is to deal effectively and efficiently, in respect of major and minor accidents. The primary objective of the plan is to keep the workplace safe and to achieve zero incidents for health hazard, and to minimize the potentiality of material, machinery/ equipment damage, impacts on the environment to minimum.

The plan should include the following:

- ❖ Fire safety plan
- ❖ Electrocution safety plan
- ❖ Medical emergency plan
- ❖ Hazardous material management plan

8.4 Emergency Response and Disaster Management Plan

Environmental emergencies are incidents or events that threaten public safety, health, and welfare and include hurricanes, floods, wildfires, industrial plant explosions, chemical spills, acts of terrorism, and others. While these events range in size, location, cause and effect, most have an environmental component. Emergency response is the organizing, coordinating, and directing of available resources in order to respond to the event and bring the emergency under control. The goal of this coordinated response is to protect public health by minimizing the impact of the event on the community and the environment. Purpose of 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-to-kin of accident victims.
- ❖ Promote inter-departmental Communication to ensure a “Companywide” Co-ordinate emergency response.
- ❖ Minimize the effects that disruptive events can have on company operations by reducing recovery time and costs.
- ❖ Respond to immediate requirements to safeguard the subtending environment 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

- ❖ Flood
- ❖ Earthquake/cyclone,
- ❖ Storm/typhoon/tornados, and

- ❖ Cloud burst lighting.

III. External Factors

- ❖ Food poisoning/water
- ❖ Sabotage, and
- ❖ War.

8.5 Six Steps in emergency response

Step 1)

- a) Determine the potential hazards associated with the incident, substance or circumstances and take appropriate action to identify the type and qualities of dangerous goods involved and any known associated hazards.
- b) Determine potential hazards stemming from local conditions such as inclement weather, water bodies etc. and ensure that the initial response team is aware of this conditions.

Step 2)

Determine the source/cause of the event resulting to the emergency and prevent further losses.

Step 3)

Conduct an assessment of the incident site for any further information on hazards and remedies.

Step 4)

Initiate redress procedures.

Step 5)

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.

Step 6)

Take appropriate steps with respect to hazards to wildlife, other resources and addressing public and media concerns and issues, as applicable. Responses priorities are to protect human lives, property and the environment.

8.6 Emergency procedures in case of fire

1. Sound the alarm by activating the nearest fire alarm pull station and call the Fire Department from a safe location. You can also call the Fire Department, and other key personnel.
2. Alert your neighbors only if you can do so without delaying your exit.
3. Leave the building immediately, close doors behind you as you exit the building and proceed to the designated emergency evacuation meeting location.
4. If you have information on how the fire started or how the alarm was activated, report it to the Fire Department.

Do not try to put out the fire. Use your common sense. Your safety is more important than property.

8.6.1 Fire Extinguishment and Confinement

Fire Extinguishment is the responsibility of the fire department. Only after ensuring that the fire alarm has been activated and the fire department are notified, should an attempt be made to extinguish a small fire.

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 person 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.

8.6.2 Portable extinguisher Instructions

A fire extinguisher, or extinguisher, is an active fire protection device used to extinguish or control small fires, often in emergency situations. It is not intended for use on an out-of-control fire, such as one which has reached the ceiling, endangers the user (i.e., no escape route, smoke, explosion hazard, etc.), or otherwise requires the expertise of a fire department. Typically, a fire extinguisher consists of a hand-held cylindrical pressure vessel containing an agent which can be discharged to extinguish a fire.



Figure 8.1: Different parts of portable extinguisher

8.7. Types of Fire

There are 4 types of fire such as:

	Class A: Class A fires are fires in ordinary combustibles such as wood, paper, cloth, trash, and plastics .
	Class B: Class B fires are fires in flammable liquids such as gasoline, petroleum oil and paint . Class B fires also include flammable gases such as propane and butane . Class B fires do not include fires involving cooking oils and grease.
	Class C: Class C fires are fires involving energized electrical equipment such as motors, transformers, and appliances . Remove the power and the Class C fire becomes one of the other classes of fire.
	Class D: Class D fires are fires in combustible metals such as potassium, sodium, aluminum, and magnesium .
	Class K: Class K fires are fires in cooking oils and greases such as animals fats and vegetable fats .

8.8 Fire Safety Risk Assessment

A fire risk assessment is an organized and methodical look at your premises, the activities carried out there and the likelihood that a fire could start and cause harm to those in and around the premises.

The aims of the fire risk assessment are:

- ❖ To identify the fire hazards.
- ❖ To reduce the risk of those hazards causing harm.
- ❖ To decide physical fire precautions and management arrangements are necessary to ensure the safety of people in your building if a fire does start.

The 5 Steps Guide to Fire Safety Risk Assessment

1. Identify the fire risks
 - Sources of ignition
 - Sources of fuel
 - Sources of oxygen
2. Identify people at risk
3. Evaluate, remove, reduce and protect from risk
4. Record, plan, inform, instruct and train

- Record significant findings and action to be done
5. Review
- Keep assessment under review
 - Review where necessary

8.9 Managing Fire Safety

A management commitment to fire safety is essential to assist with achieving suitable fire safety standards in premises and in the maintenance of a strong culture of fire safety. This chapter covers management standards that should be achieved within all premises in respect of:

- ❖ Fire safety Policy
- ❖ Emergency fire action plan
- ❖ Fire safety information & training
- ❖ Fire drill
- ❖ Maintenance of fire safety measures
- ❖ Recording information and keeping records



Figure 8.2: Fire Safety Equipment

Fire is spread by three methods:

1. Convection
2. Conduction
3. Radiation



Figure 8.3: Flow Diagram of Planning and management Fire Safety System

8.10 Safety training

In order to reduce the risks associated with accidents, internal and external threats, and natural disaster a safety training program is essential for workers in plant operation. There should be a regular training program on safety for the workers to increase their awareness and also to reduce the risks. Provision of yearly professional training for health and safety would enhance the effectiveness of safety. Safety training should be planned for the local people living around the project area so that they can be aware about the risk and can take appropriate preparation.

8.11 Environmental safety management team

There should be provision of environmental safety management team with responsibility of implementation, inspection, documentation, and reporting of the safety plans. The team will also be responsible for implementing emergency plans under the Directorate of Environment, Health and Safety. The team should be a combination of multidisciplinary professionals. The team composition could be as follows:

- Environmental Quality and Safety Manager (Team Leader)
- One Emergency Manager
- One Fire Safety Manager
- Two Safety Managers
- One Chief Security Officer
- Five Security Officers
- One Chief Medical Officer
- Five Medical Officers
- Ten Rescue Officers

8.12 Disaster Management Plan

The project authority will have to take necessary disaster management plan to protect the properties from water logging / flood etc. In this regard all construction works should be undertaken at a higher level taking the highest flood level into consideration. Disaster may occur if the environmental protection equipment fails works at normal condition. This situation may arise any of the following causes-

- When plant run abnormal situation such as emission level increases than its normal level.
- If liquid waste over flow and pollute the surrounding

Disaster management plan should consist of preventing measures including among others, the following-

- Formulation and strict implementation of safety codes and measures
- Periodic inspection of safety relief valves provided with pressure vessels and equipments
- Preventive maintenance
- Aware the workers about electric shock
- Declaring factory No Smoking zone
- Mock drills by the fire fighting cells
- Provision and inspection of fire fighting cells
- Proper training of employee about fire and other disaster
- Training the employee and the residence of the surrounding villages about the action to be taken during an accident or disasters.

8.13 Environmental Health and Safety (EHS)

Environmental, health and safety (EHS) departments, also called SHE or HSE departments, are entities commonly found within companies that consider environmental protection, occupational health and safety at work as important as providing quality products, and which therefore have managers and departments responsible for these issues. An Environmental, health and safety (EHS) register is essential for monitoring of performance of the entire facility community in relation to the environment. The management will use this as self auditing tools.

This register should includes-

- ✚ Fire extinguisher servicing records
- ✚ EHS meeting schedules and training records
- ✚ Electrical instillation
- ✚ Generator inspection and maintenance record
- ✚ Waste disposal records
- ✚ Inventory Records
- ✚ Emergency response procedure.

CHAPTER –9

CONCLUSIONS AND RECOMMENDATIONS

9.0 Conclusions and Recommendation

9.1 Conclusions

The ESIA study of proposed Tosrifa Industries Limited has been concluded that the all environmental, metrological, geographical, biological aspects are well suited for the project. By adopting all documents of proposed project such as layout, total land, proposed activities (during construction and operational stage), project cost, utilities requirement, transportation mode the team found out the possible impact of project on surrounding environment, socioeconomic condition of project area. Observing all legal issues related to proposed project, the team gave a set of management plan to minimize the negative impacts and enhance the positive impacts. The management plan/mitigation measures have been given to run the proposed plant environment friendly way without damaging ambient conditions. The environmental analysis has revealed that the project can be set-up according to the proposed design and configuration in the proposed site and location. The environmental impacts are of limited nature, whereas the benefits of the project are many.

In this study, the effects of the project activities on physico-chemical, ecological and socio-economic (i.e., human interest related) parameters during both construction and operation phases have been assessed. The impacts have been identified, predicted and evaluated, and mitigation measures suggested for both construction and operation phases of the proposed Tosrifa Industries Limited project. The important physico-chemical environmental parameters that are likely to be affected by the project activities include water quality, air quality and noise level.

The study suggests that most of the adverse impacts on the physico-chemical environment could be offset or minimized if the mitigation measures are adequately implemented. Noise level has been identified as a significant potential impact of the proposed Tosrifa Industries Limited during both the construction and operation phases. The noise generated from power Generators and construction activities might become a source of annoyance at the residential area located close to the project site if noise attenuation measures are not taken. Mitigation measures, including installing proper silencers and acoustically designed engine rooms have been suggested in order to reduce noise exposure. High level of noise is expected to be generated within the confines of the construction and generator installations. Prolonged exposure to such high level of noise may cause permanent hearing loss. Therefore, proper protective measures should be adopted during the operation and inspection of this equipment. The project workers should not be exposed to the noise produced by the construction equipment for a prolonged period to prevent permanent hearing loss. A rotational work plan is advised for the workers and operators of this equipment.

Some adverse impact during the construction and operation phase of the plant will come from SPM, NO_x and SO_x emission from the power generators. Ambient air quality in construction phase especially SPM is high due to different construction activities of the project.

The management of solid waste can become an issue during construction and operation phase. As per the EMP, the solid waste generated from the construction and production unit has to be segregated before sending it for disposal to landfill or selling it to other users. If the solid waste generated from production has leaching characteristics exceeding USEPA limit, special containment measures (such as in a lined pit) need to be adopted by TIL to safely dispose the waste.

There is no significant impact on social as discuss earlier of the chapter. Especially The proposed unit will be constructed within the 37.65 bigha land. No land acquisition is required, No indigenous people will be affected by the project construction and operation, No resettlement has done because it will construct TIL own land, TIL will manage temporary labor influx inside the project. During operation phase, no significant negative impact is anticipated on socio-economic environmental parameters. Significant positive impacts are expected due to improvement in job opportunity in the area. This will help the local people and contribute to the livelihood standard.

During public consultations carried out as a part of the ESIA study, people welcomed the proposed Tosrifa Industries Limited project at holding no. 121/1, Block –H, Word no-07, Beraiderchala, Sreepur, Gazipur, Bangladesh. However, they want to the project authority to improve local people life standard by getting job opportunity, education and medical facility.

9.3 Recommendations

It is recommended that the Environment and Social Management Plan be followed in the construction, operation and decommissioning phase of the project. The plans and procedures that have been specified in the ESIA report should be elaborated by the Tosrifa Industries Limited for management of smooth and safe operation of the plant. It is also recommended that the environmental monitoring plan be effectively implemented in order to identify any changes in the predicted impacts and take appropriate measures to off-set any unexpected adverse effects.

Apart from risks associated with emissions, noise generation, solid waste, hazardous waste and wastewater disposal as a result of construction and operation activities, An emergency response plan (ERP) for the proposed textile manufacturing project has been developed listing various actions to be performed in a very short period of time in a pre-determined sequence if it is to deal effectively and efficiently with any emergency, major accident or natural disaster.

Based on the Environmental and Social Impact Assessment (ESIA) conducted for the project following recommendations is suggested:

- TIL should continuously (Preferably annually and half yearly) monitor the air, noise, and temperature and water quality to cope up with their environmental vision.
- TIL should undertake and expanded the tree plantation program inside the project area and surrounding environment.
- TIL workers to be given appropriate personal protective equipments (PPE) especially risky area
- All solid waste to be collected, handle and dispose properly in accordance to applicable waste management regulation.

CHAPTER – 10

REFERENCES

1. ADB, 1992c: Guidelines for Health Impact Assessment of development projects, Asia Development Bank, Manila, Phillipines.
2. BBS, 2011: The Statistical Year Book of Bangladesh. Bangladesh Bureau of Statistics , Dhaka Bangladesh.
3. Bangladesh Meteorological Organization, 2015: Meteorological data, Abhawa Bhavan, Dhaka, Bangladesh.
4. Canter, G. T., 1983: Environmental Impact Assessment Hand Book, Mc. Graw Hill, England.
5. DoE, 1995: The Environmental Conservation Act, Department of Environment, Government of Bangladesh.
6. DoE, 1997: EIA Guidelines for Industries, Department of Environment, Ministry of Environment and Forest, Dhaka, Bangladesh.
7. DOE, 1997: The Environmental Conservation Rules, Department of Environment, Government of Bangladesh.
8. DoE, 2014: Environmental Management Plans Guidelines, Australian Government.
9. DIPNR, 2004: Guidelines for the preparation of Environmental Management Plan, Department of Infrastructure, Planning and Natural Resources, Henry Deance Building, Sydney, NSW, Australia 2000.
10. Dara, S.S. 1995: Environmental Chemistry and Pollution Control, S. Chand & Company Ltd., New Delhi, India.
11. De, A. K. 1989: Environmental Chemistry, Wiley Eastern Ltd., New Delhi, India.
12. GoB, 1992: Bangladesh Environmental Policy.
13. GoB, 1995: National Environmental Management Action Plan (NEMAP)
14. International Finance Corporation (IFC), 2007: General Guidelines for Environment, Health and Safety.
15. MoEF, 2006: Ambient Noise quality Standard, Government of Bangladesh.
16. Munn, R. E. 1979: Environmental Impact Assessment- Principal and Procedures, Jhon Wiley and Sons.
17. MoEF, 2005: Air Quality Standard, Government of Bangladesh.
18. Shah, S.K. 2007: Environmental Impact Assessment for changing world. AH Development Publishing House, Dhaka, Bangladesh.
19. IFC Performance Standards(2008): International Finance Corporation, Land Acquisition & Private Communication (2005-2006): Information from Rural Industries
20. WB (2007): The World Bank Operation Manual: Involuntary Resettlement
21. www.adb.org/documents/guidelines/environmental_assessment/environmental_categorization.pdf