ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR ODHAV MULTI-INDUSTRIES (SL) LTD's STEEL MANUFACTURING AND PROCESSING PLANT

EXECUTIVE SUMMARY & MAIN ESIA REPORT

Prepared by:

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Freetown, Sierra Leone

For

Odhav Multi Industries

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LIST OF ACRONYMS

^{0}C	Degrees Celsius
%	Percentage
”	Inch
AC	Affected Community
CBO	community-based organisation
CEMMATS	Construction Engineering Maintenance, Manufacturing and Technical ervices
CHO	Community Health Officer
CI	Corrugated Iron
dB	decibels
EPA-SL	Environment Protection Agency – Sierra Leone
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
ERP	Emergency Response Plan
GDP	Gross Domestic Product
GIS	Geographic Information Systems
GoSL	Government of Sierra Leone
GPS	Global Positioning System
HDI	Human Development Index
HEP	Hydro-electric power
IFC	International Finance Corporation
IMR	Infant Mortality Rate
JSS	Junior Secondary School
Km	kilometre
Km^2	Square kilometre
kV	kilovolts
Le	Leones
m	metre
MCH	Maternal and Child Health
MDA	Ministries, Departments and Agencies
MFIs	micro-finance institutions
mg	milligram

mg/L Milligram per litre

mg/m^3 Milligram per cubic metre

MLCPE Ministry of Lands, Country Planning and the Environment

mm millimetre

MoHS Ministry of Health and Sanitation

m/s Metre per second

MW Mega Watts

MWHI The Ministry of works, Housing and Infrastructure

N North

NGO Non-Governmental Organization

PAPs Project Affected Persons

PCDP Public Consultation and Disclosure Plan

PRSP Poverty reduction Strategy Paper

PS Performance Standard

RAMSAR Convention on wetlands of international importance

RAP Resettlement Action Plan

RPF Resettlement Policy Framework

SLEPAA, 2008 Sierra Leone Environment Protection Agency Act, 2008

SSS Senior Secondary School

STDs sexually transmitted diseases

TOR Terms of Reference

WMP Waste Management Plan

EXECUTIVE SUMMARY

Odhav Multi Industries is the first fully automated steel manufacturing company in West Africa and it was founded in in Massaya (Dubreka), Republic of Guinea. Odhav Multi Industries has an annual steel production capacity of 200,000MT. Odhav signed a $240 million investment agreement with Sierra Leone's Ministry of Trade and Industry in 2021 with plans of developing a Steel Manufacturing and Processing plant on 160 acres of land in Songo, Koya Chiefdom, Port Loko. The company plans on buying and recycling scrap steel from local vendors to manufacture finished products like iron rod, nails, roof sheet, pipes, binding wires etc.

CEMMATS Group Ltd has been contracted to conduct the ESIA investigations. This ESIA report presents the results and outcomes of these investigations carried out by a team of environmentalists and socio-economists within the project boundary, and presents data and information collected through environmental investigations and social consultations carried out during the study.

The purpose of the environmental impact assessment is to identify and to mitigate potential negative and positive environmental impacts. This is done through the conduct of desktop and field studies to

- Obtain secondary and primary biophysical and socio-economic data
- Anticipate the potential impact of the proposed project on the environment and communities
- Propose an environmental management plan that mitigates adverse impacts whilst enhancing positive ones.

These were achieved by employing a methodology that consists of a literature review, field investigations and the administration of questionnaires.

The purpose and findings of the study will be disclosed to project interested and affected persons (I&APs) in a series of stakeholder consultation and disclosure meetings to elicit community acceptance, participation and on-going stewardship that are imperative for the construction and operation of the facility.

The construction phase will include the erection of the following plant infrastructure:

- Factory area for Steel plant (Raw Material Handling system, Blast furnaces, mills, coke-oven plant, oxygen furnace)
- Offices/Admin building
- Clinic
- Residential building
- Workshop
- Warehouse/storage area
- Security post
- Restrooms
- Carpark

- Weighing bridge

The operation of the plant will involve the handling and storage of raw materials including ore, coal, coke, etc. that are used in the Manufacturing process.

The project activities during the Operations phase include:

- Manufacturing activities of the different plants
- Handling and storage of raw materials
- Transportation of raw materials, finished products and personnel
- Water supply, storage and treatment
- Management of solid waste and wastewater
- Management of gas emissions

Legal and Regulatory Framework

The regulatory institutions, laws, policies and regulations governing a project of this natures are discussed in detail in Table 4.1-1 and Table 4.2-1. Most important among these are:

Regulatory Bodies:

- Ministry of Trade and Industry
- The Ministry of the Environment and Climate Change
- Environment Protection Agency
- Ministry of Lands Housing and Country Planning
- Ministry of Labour and Social Security

Legal Instruments:

- The Environment Protection Agency Act, 2022
- The Consumer Protection Agency Act, 2020
- The Standards Act, 1996
- The Sierra Leone Local Content Agency Act, 2016
- The National Land Commission Act, 2022
- The Sierra Leone Trade and Industry Policy
- The National Employment Policy and Action Plan, 2015

International guidelines and conventions, including those to which Sierra Leone is a party are discussed in Chapter 4.3. The International Finance Corporation's (IFC) Health and Safety Guidelines for Integrated Steel Mills is referenced and used in the preparation of the Environmental and Social Management Plan (ESMP) for the Project.

Environmental and Social Baseline

Environmental and Social baseline of the project area was assessed through visits by a team of environmental and social experts in September 2022. It must be noted however, that at the time of the assessment, land clearing had already been conducted and some construction was underway. Air quality, noise levels, hydrology and ecology of the project site were investigated. No issues of grave concern were identified. The site is not located in or near any ecologically sensitive area, and no species of conservation concern were identified. No major rivers are found within 1km of the site; there are however small streams and swamps, including the 'Bondo Water' stream which passes close to the project concession, and for which there are reports from the community of some degree of pollution from eroded soil being carried from the project site by surface water.

The closest communities identified within the project's immediate environment in which the socio-economic assessment was carried out include.

- Songo Town;
- Mokoloh; and
- Kontha Line.

Songo is the largets of the three (3) communities located in the project's immediate environs, and is also the most populated. It lies partly in Koya Chiefdom, Port loko District and partly in the Western Rural District. It has over 500 houses with an estimated population of about 2500 people. Konta Line community lies entirely in the Western Rural District. It has over 300 houses with an estimated population of about 1300 people. The third immediate community around the project area is the Makoloh community which lies entirely in Koya Chiefdom, Port Loko Disrict. It has about 250 houses with an estimated population of 900 people.

These project site communities are all relatively disadvantaged as they lack access to safe drinking water, electricity, proper toilet facilities, health facilities and even face intermittent food shortage.

These Focus Group Discussion meetings were held with sample community stakeholders including, community leaders, farmers, women, youth etc. in the three communities. The meetings were held in order to get a snapshot understanding of the communities' socio-economic status and perceptions of the proposed project. Participants in the communities were aware of the project and welcomed the project to their communities. There were however concerns raised about the company's consultations with communities, especially by Makoloh and Kontha Line who reported that they have not been consulted much on the project, and were not included in the land lease negotiations.

Impact Assessment and Mitigation

Impacts identified as likely to occur throughout the project's lifetime were identified and mitigation measures developed. These are discussed in detail in Table 7.2-6 and Table 7.2-7. Main impacts identified have to do with noise generation, water contamination (particularly during the construction phase), occupational/community health and safety. Environmental and Social Management Plans have been prepared to guide the implementation of mitigation measures, to ensure effectiveness throughout the project life-cycle.

Environmental and Social Management Plans

The Environmental and Social Management Plan (ESMP) presents the environmental management, mitigation, monitoring and institutional measures to be taken during project implementation and operation to reduce adverse environmental and social effects to acceptable levels. It specifically

defines what actions must be taken and who is responsible to reduce project impacts. The ESMP also includes several component plans defining specific action programs for waste management, emergency response, closure and reclamation, community development, resettlement, and public consultation and disclosure. The ESMP highlights the issues and concerns that are presented in the ESIA and identifies reasonable and practical responses to address and mitigate potentially adverse effects. It includes the following component plans:

- Environmental Health and Safety Plan
- Waste Management Plan
- Emergency Response Plan
- Closure Plan
- Community Development Action Plan
- Public Consultation and Disclosure Plan
- Management, Mitigation, Monitoring and Implementation Measures

1 INTRODUCTION

1.1 Background

Odhav Multi Industries is the first fully automated steel manufacturing company in West Africa and it was founded in in Massaya (Dubreka), Republic of Guinea. Odhav Multi Industries has an annual steel production capacity of 200,000MT. The company wants to expand its business to other countries with the establishment of Odhav Multi Industries (SL) Limited (hereinafter referred to as Odhav) in Sierra Leone. Odhav signed a $240 million investment agreement with Sierra Leone's Ministry of Trade and Industry in 2021 with plans of developing a Steel Manufacturing and Processing plant on 160 acres of land in Songo, Koya Chiefdom, Port Loko. The company plans on buying and recycling scrap steel from local vendors to manufacture finished products like iron rod, nails, roof sheet, pipes, binding wires etc. The project will cater for a market size of 350,000,000 and job creation for 1200 employees within the ECOWAS region.

Prior to commencement of an industrial project, like any other project that may affect the environment and communities, it is mandatory by legislation that an ESIA study be done and an EIA licence secured. The Sierra Leone Environment Protection Agency Act (2008) (SLEPAA) and the EIA Supplementary Act (2010), require that companies meet the local legal requirements and demonstrate commitment to protect the environment.

CEMMATS Group Ltd has been contracted to conduct the ESIA investigations. This ESIA report presents the results and outcomes of these investigations carried out by a team of environmentalists and socio-economists within the project boundary, and presents data and information collected through environmental investigations and social consultations carried out during the study.

1.2 National Perspective

The three main contributors to Sierra Leone's GDP are the Agriculture, industry and Services sectors with Agriculture being the main contributor followed by services and then Industry. The share of Industry declined from 5.6% in 2019 to 5.2% in 2020 and has since grown to 5.9% in 2021 and an estimated 6.5% in 2022. Sierra Leone's economy grew by 5.3% in 2019 from 3.5% in 2018 as a result of the growth in the Industrial sector. However, this growth was curbed by the COVID-19 pandemic in 2020 which caused disruption to services and businesses due to social distancing measures and lockdowns. This impact was particularly felt in industrial sectors including the mining, transport, manufacturing, trade and tourism sectors. The economy is just now recovering with a GDP growth rate of 4% in 2021 and an expected growth rate of 3.8% in 2022. This growth rate can be largely attributed to the reopening of the mining and manufacturing sectors with industry added growth recovering from -7.1% in 2020 to 17.4% in 2021 and an expected growth of 8.9% in 2022. (Statistics Sierra Leone,2022)

With the growth needed in the Agriculture, Industry and Service sectors to boost economic development in Sierra Leone, the establishment of a Steel manufacturing plant like Odhav Multi Industries will significantly contribute to this growth through infrastructural development and job creation. Iron ore which is an essential component of steel production is the most widely used metal in the world as it is used in practically every industry from the energy industry to construction,

transportation and manufacturing industries. As such, steel production and consumption reflect the level of industrialization and economic development of a country and are an essential component of a country's GDP. Worldwide, the steel industry alone accounts for $2.5 trillion in product sales annually and employs more than 6 million people with every two jobs within the steel sector supporting thirteen more jobs throughout the supply chain. The industry also has an unusually large global supply chain with every $1 added by work within the steel industry accounting for $2.50 of value added activity across other sectors of the global economy. (Oxford Economics, 2019).

In Sierra Leone, steel products have always been imported. Odhav Multi Industries will be the first steel manufacturing company in the country. With its establishment, there is expected to be a significant reduction in the importation of steel products which is expected to positively impact the economy. Odhav's Steel factory in Sierra Leone will not only be one of the largest in the Mano River Union Basin, it is also expected to meet a market size of 350 million within the ECOWAS region. This will mean massive job creation, industrialization and tapping into the regional markets. On the whole, Odhav's establishment will enhance infrastructural development, decrease reliance on imported products and boost the country's economy in general.

1.3 Project Area

Port Loko district is located in the North West Province of Sierra Leone and borders the Western Area to the west, Kambia district to the north, Bombali district to the east and Tonkolili district to the south. The district is the most populous district in the north and the second most populous in Sierra Leone. Koya chiefdom is located in the south of Port Loko District.

The project site is located near a plot of land covering 160 acres of land off the Masiaka-Yonibana Highway. The location of the project site is shown in Figure 1.3-1:

Figure 1.3-1: Map of Project Site

1.4 Environmental and Social Impact Assessment Process

1.4.1 Stages of the ESIA Process

Prior to commencement of any project that may affect the environment and communities, it is mandated by legislation that an ESIA (or ESHIA) study be completed, and, upon approval by EPA-SL, a licence is secured.

The Sierra Leone Environment Protection Agency Act (2008) (SLEPAA, 2008) and the EIA Supplementary Acts (2010), describe the requirements and process for securing an EIA licence, which is laid out in a "checklist" prepared by EPA-SL. In short, the client first applies to the local regulatory body, the EPA-SL for an EIA Licence. EPA-SL requires that a screening form be completed and submitted with the application letter, after which they decide on the category of the project. This is followed by a scoping investigation and report. EPA-SL will then decide on the Terms of Reference (TOR) to be drafted by the project proponent or an independent consultant carrying out the ESHIA study on behalf of the project proponent.

Upon the approval of the Agency, the consultant carries out an assessment of the environmental, social and health impacts of the planned operations on ecosystems, the physical environment and communities within the Project area. A report is prepared at the end of the study and submitted to EPA-SL for review (this report). If approved, the proponent will then be requested to conduct public disclosure meetings with relevant stakeholders on the findings and recommendations of the study, and incorporate comments, suggestions and requests made during those meetings into a public consultation and disclosure report. Finally, all reports pertaining to the ESIA study are then forwarded to the Board of EPA-SL for a decision to be made on the issuing of the licence.

1.5 EIA Guidelines for Manufacturing Industry

According to guidelines developed by EPA-SL, developments in the Manufacturing Industry are grouped into two categories; those projects for which an Environmental Impact Assessment (EIA) is mandatory and those that only require registration and a preliminary assessment to be given an Environmental license. The projects for which an Environmental Impact Assessment is mandatory include:

- Chemical - where production capacity of each product or combined products is greater than 100 tonnes/day.
- petrochemicals-all sizes or raw materials requirements of 100 tonnes/day or greater;
- non-ferrous metal-smelting
- Aluminium-all sizes;
- Copper-all sizes;
- Others-producing 50 tonnes/day and above products;
- Non-metallic-cement
- Lime – 10 tonnes/day and above burnt lime rotary kiln or 50 tonnes/day and above vertical kiln.
- Iron and steel;
- Shipyard;
- Pulp and paper

Based on these guidelines, this project is classified as a project requiring a full ESIA which will comprise of an Environmental Impact Assessment (EIA) and an Environmental and Social Management Plan (ESMP).

1.5.1 Purpose of the ESIA Study

The purpose of the environmental impact assessment is to identify and to mitigate potential negative and positive environmental impacts. This is done through the conduct of desktop and field studies to

- Obtain secondary and primary biophysical and socio-economic data
- Anticipate the potential impact of the proposed project on the environment and communities
- Propose an environmental management plan that mitigates adverse impacts whilst enhancing positive ones.

These were achieved by employing a methodology that consists of a literature review, field investigations and the administration of questionnaires.

The purpose and findings of the study will be disclosed to project interested and affected persons (I&APs) in a series of stakeholder consultation and disclosure meetings to elicit community acceptance, participation and on-going stewardship that are imperative for the construction and operation of the facility.

1.5.2 Objectives of the ESIA Study

The objectives of the study were as follows:

- To assess the potential positive and negative impacts of the planned project on society and the environment
- To recommend mitigation measures to avoid or mitigate negative impacts and enhance benefits
- To recommend an environmental management plan that integrates mitigation measures into project management
- To develop relevant environmental and social management plans for the successful implementation of the project as follows:
  - Waste Management Plan (WMP)
  - Emergency Preparedness Plan (EPP)
  - Public Consultation and Disclosure Plan
  - Resettlement Policy Framework
  - Closure Plan
- To conduct public disclosure and consultation meetings on the findings and recommendations of the EIA study.

1.5.3 ESIA Consultants and Teams

In response to this, a number of specialists were identified to undertake the investigations and address these issues during the ESIA phase. A team was formed of the respective ESIA consultants and sub-teams.

The terms of reference for each of these studies are outlined in the next section. The specialist studies were undertaken during the ESIA phase. An Environmental and Social Impact Assessment (ESIA) report summarizing all their findings has been compiled using the information gathered during these studies. The recommendations and mitigation measures developed from these studies have also been pulled together to generate an Environmental and Social Management Plan (ESMP) which will be adhered to during the various stages of each project component.

Table 1.5-1: ESIA Study Team

Study Aspect	Consultants
Project Director/ Legal and Regulatory Issues	Andrew Keili
Project Manager	Vanessa James
Environmental Lead	Desmond Alie
Socio Economist (social consultations and focus group meetings)	Mohamed Mansaray
Ecologist	Juliet Jabaty
Hydrologist	Nyaveh Keili

1.6 Description of the Terms and References (TOR)

The ESIA has been primarily done to meet the local requirements for securing the EIA licence from EPA-SL. International guidelines such as the International Finance Corporation are referenced where applicable.

The study which consists of biophysical and socio-economic baseline data collection and impact assessments, was conducted using a combination of desk studies, field work and post-field data analysis and report writing.

1.6.1 Desktop Study and Document Review

In order to effectively and efficiently identify and assess the main environmental and socio-economic effects and impacts which project activities are likely to have on the environment, project data as well as relevant reports and studies were reviewed.

1.6.2 Field Studies

A site visit was undertaken by a team of environmental and social specialists in September 2022, to gather primary data on the project. Consultative focus group meetings were held with relevant stakeholders to obtain socio-economic information and get their perceptions about the project.

1.6.3 Post-field Studies

Post field studies include:

- Analysis and processing of data using statistical and Geographic Information System (GIS) mapping tools.
- Data representation and report writing.

The terms of reference for the study is summarised in Table 1.6-1:

Table 1.6-1: Terms of Reference for the ESIA

Activity	Objectives	Methodology
Technical Assessment and Reporting: EPA-SL EIA Licensing Stages 1 to 4		
Institutional, Legal and Regulatory Framework	Determine the legal and regulatory issues to be taken into consideration in all phases of the plant's operations, and ensure that these are being adhered to.	This will be done through desk studies and literature reviews; legal and regulatory issues relevant to the project will be included in the report and their relevance highlighted.
Organisational Structure and Management	Provide a description of the operational and reporting structure for the plant, in order to aid in the allocation of responsibilities in the development of Management Plans.	This aspect depends entirely on information provided by the client, specifically organograms and brief job descriptions and information on manning.
Hydrology	A hydrocensus of the study areas will be undertaken. During the hydrocensus, important data pertaining to the current groundwater conditions and uses in communities around the plant will be collected. This will include localities of current groundwater abstraction points, ownership, current usage volumes and types, equipment and groundwater levels. The data collected will serve as a reference point against historical and future groundwater conditions in the area. Objectives include: ⍰ To determine direct physical impacts of the project on the surface and groundwater. ⍰ To record baseline qualitative and quantitative data ⍰ Suggest mitigation measures to address the impacts noted in the surface and groundwater hydrologic assessment.	Desk study: A review of existing data on this area will be undertaken together with additional information which may include: • A description of site in terms of sensitive characteristics • A review of land (water) uses and predicting the potential impacts that could arise from the proposed project; and • Review of existing baseline water quality data (local/regional) and the national water quality targets applicable to the project. • Hydrological information and water management: Information on rainfall in the localities, evapo-transpiration, water management, run-off, hydrology, sediment control etc Field surveys: • On-site measurements of physico-chemical parameters such as, pH, Temperature, dissolved oxygen, turbidity and conductivity. • Identify potential sources of pollution. • Identify potential impacts that could result from the proposed project on the surface water resources.

Activity	Objectives	Methodology
Air Quality	The main purpose for conducting a dust assessment is to collect baseline data and predict impact. In order to better appreciate this parameter, possible cumulative air contaminants/pollutants, monitored ambient and meteorological data will be sourced for the area under investigation. If there are no ambient monitored data available, a qualitative assessment will be undertaken which will evaluate the possible impacts of other polluting sources within the area.	Desk Study • Ambient and meteorological data will be sourced for the area under investigation. • Review of project details to identify key aspects that might have significant air quality impacts during the project planning, construction and operational phases, and identification of potential point and non-point sources of pollution Field Work • Baseline assessment involving in-situ measurements for PM10, PM2.5 and CO in the project area and its environs. • Qualitative assessment will be undertaken which will evaluate the possible impacts of other potentially polluting sources in the project area. This will be done through observations and consultations. Potential sources of pollution within the project area, outside of the plant activities will be identified such as oil palm processing, burning of bush farms, etc.
Noise	To assess the ambient noise levels in the proposed project area in accordance with appropriate international standards and guidelines.	Desk Study Review of project details to identify key aspects of project that might have significant noise impacts during the project planning, construction and operational phases and identification of potential noise generating points and non-points. Field Survey: • Preliminary survey and identification of measuring points for readings. • Sound pressure readings will be done at the closest residential areas; readings will be taken in residential areas at reasonably spaced distances along the route.

Activity	Objectives	Methodology
		• Noise survey at the identified measuring sites – in-situ ambient noise measurements • Ambient noise levels will be measured at various times of the day and night.
Soils, land use, and Geology	The soil study will aim to characterize the soils in the study area that are to be affected by the proposed project. It will provide an indication of the existing soil and land capabilities for the survey area and give a characterization of the land capability within the study area.	Desk Study: • Literature reviews will be done on the soils and geology of the project area based on previous studies. A description of this in relation to the proposed activities will be presented in the report. • Results of geotechnical surveys carried out at the site will be reviewed and relevant aspects incorporated into the ESIA report • Soil suitability for land use and susceptibility to erosion, landslide etc., will be ascertained. • Information on land use patterns, subsistence agriculture, mapping existing land use categories aligned with a vegetation map.
Land Ecology	Determination and description of the different types of flora and fauna in the study area and the impact the construction and operational activities may have on them.	Desk Studies: • Aquatic ecology assessment will be conducted based on literature reviews on previous studies carried out within the project area • Field Studies: • Field assessment will be conducted to obtain a first-hand understanding of ecological conditions (land and aquatic) at the site as it is now and to corroborate or update information obtained during literature reviews. • Wildlife habitats, rare, threatened, or endangered species and / or high biodiversity / sensitive habitat; watercourses will be identified where possible with a view to determining the impacts of the project on them. This will also extend to critical

Activity	Objectives	Methodology
		terrestrial and aquatic habitats (e.g., old-growth forests, wetlands, and fish spawning habitats). • Floral and faunal surveys will be conducted. Mammal species around the project area will be noted through ecological indicators, such as calls, tracks and dung. The presence of avifauna will be recorded by means of sightings, calls, droppings and the presence of nesting sites. Fauna and Flora lists will be generated and the relationship between fauna species and their habitat discussed.
Waste Management	Management of waste from activities in all phases of the project will be assessed under the following area: • General waste reception • Waste water management • Solid waste management • Disposal of hazardous materials • Management of Oil and Lubricant waste	Desk studies: Literature review of documents provided by client and other relevant sources. Recommendations for waste management good practices will be made.
Steel plant operations/Technical works/implementation plan/Risk Assessment	Relevant parts of the project, such as location, scale, capacity, equipment, installations, staff and support, plant operations, risks, facilities etc. will be described.	Desk Study: This will take the form of desk review and field observation of plant plans and design, equipment and machinery, ancillary facilities, campsites, scraps yard, waste management, access roads, clearing and grubbing, traffic management, erosion and sediment control, handling of fuel and used oil, spills control and accident management, road safety. • Particular attention will be paid to the following: • Operations management (including, staff training) • Drainage system to include spill containment in operational areas • Spill prevention and containment • Environmental training for employees

Activity	Objectives	Methodology
		• Scheduled equipment maintenance and record keeping on site • Waste management and record keeping • Risks associated with these and other activities identified will be assessed. Occupational Health and Safety issues will also be considered. A review will be done on the construction and operational aspects of the project and the main health and safety hazards summarized.
Socio Economic and Social Impact Assessment	• Provide a detailed description of the socio-economic environment in and around the project area. • Provide and analyse the socio-political structure and political/dispute resolution institutions and mechanisms. • Analyse the potential impacts of the proposed project. • Provide guidelines for limiting or mitigating negative impacts and optimizing benefits. • Get the community perception/opinions/benefits of the project.	Community Consultations and Focus Group Discussions at the project site to obtain local socio-economic information, ensure that the community is aware of the project, and record views and perceptions. Desk studies and literature reviews will be done to provide statistics and data on the socio-economic status of the district. Physical observations done in the field will include: • Describe the local socio-economic environment with particular reference to the communities that will be directly affected by the project. • Determine the current land use within the development area that is likely to be affected. • Assess the local social infrastructure (health, education, markets, community). • Describe the formal and informal governing structures. • Identify income and expenditure trends; • Describe the local historical context; • Describe landownership and property rights; • Assess the significance of potential environmental and social impacts on the local community and the District; • Identify local development needs and problems and evaluate how the project could contribute to a sustainable community development plan;

Activity	Objectives	Methodology
		• Investigate possible impacts of the project on health, livelihoods, income levels, education levels, food security and other factors relevant to the affected community's ability to participate in the potential economic benefits the project may offer should be discussed; • Provide recommendations to mitigate negative impacts and optimize positive impacts. • Gain an understanding of cultural beliefs and practices, particularly those relating to sites of cultural significance that could be affected.
Management of Environmental Health and Safety Issues/ EHS Policies and Procedures	Development of management plans to provide effective mitigation against potential hazards, including Environmental Health and Safety Plan, Waste Management Plan, Emergency Response Plan, Public Consultation and Disclosure Plan, etc.	Review of information provided by client on any EHS, OHS and CHS policies and plans guiding their operation; review of best practices used internationally; development of management plans. Description of the Client's commitment towards environmental and social objectives, labour/occupational health and safety standards, and community engagement
Community Health and Safety	Communities' exposure to construction issues and safety issues that may arise from a project of this nature will be investigated.	
Occupational Health and Safety	Occupational health and safety hazards which may arise during development of the steel plant will be described, along with measures for their prevention and control, in the Environmental Management Plan.	
Technical works/implementation plan/Risk Assessment	Review of the technical operations involved in project implementation, in order to determine which activities may pose environmental/ occupational/ community health and safety risks. Development of Management Plans to mitigate potential impacts.	This will be conducted through literature review of information provided by the client. Particular attention will be paid to the following: • Health and Safety policies, procedures, safe guards. • Emergency response • Spill prevention and containment • Exposure to electrical currents/ voltages

Activity	Objectives	Methodology
		Risks associated with these activities and other activities identified in project description provided by client, will be assessed.
Follow up EPA-SL and Status Reporting to Client: EPA-SL EIA Licensing Stages 5 to 6		
Follow up on EPA-SL review Process	This will be done in order to determine the progress of the Licensing Process and estimate timeframes within which the process would be completed.	Follow up will be done through telephone calls and emails to the Agency.
Status Reporting	Keep client updated on any developments and progress of the project.	Status updates will be sent to the client weekly by email; any official correspondence forwarded by EPA-SL will be immediately circulated.
Licence Fee negotiations	CEMMATS Group Limited will accompany or represent the client at the License Fee negotiations.	
Environmental Compliance Monitoring: EPA-SL EIA Licensing Stage 7		
Quarterly and Annual Monitoring and Reporting to EPA-SL	CEMMATS can provide services on environmental and social monitoring through physical site measurement, consultative meetings, data collection of project utility usage, waste management, occupational health and safety etc. These will be collected on a monthly basis and compiled into quarterly and annual reports as required by EPA-SL. These services will be provided based on a separate contract.	

1.7 Assumptions and Limitations of Study

- The ESIA study has been undertaken to meet the national requirements for securing the EIA Licence. Relevant international guidelines, have also been incorporated into the ESIA;
- The timeframe within which the study was undertaken did not allow for seasonal variations to be taken into consideration.
- Most of the socio-economic data and information about the project area was collected during the baseline survey conducted in September 2022, through focus group discussions. Hence, any recommendations, opinions or findings stated in this ESIA report are based on circumstances and facts as they existed at the time CEMMATS performed the field works.

Notwithstanding the aforementioned assumptions and limitations, the ESIA Team employed an evidence-based approach and included scientific information relevant to the Project area within the stated limited options.

1.8 Organisation of the ESIA Report(s)

The final report consists of two (2) volumes of reports. Below are brief comments on the contents.

1.8.1 The ESIA Report

Volume 1 –The Executive Summary and Environmental and Social Impact Assessment (ESIA) contains the policy, legal and administrative framework under which the ESIA was carried out. There is an analysis of the feasible alternatives, including the "no project" alternative, and a description of the project in its geographic, environmental and social context. It includes baseline data describing the relevant physical, biological and historical conditions and the environmental effects associated with project implementation. Mitigation measures needed to control those effects to acceptable levels are presented.

Volume 2 – Environmental and Social Management Plan (ESMP) presents the environmental management, mitigation, monitoring and institutional measures to be taken during project implementation and operation to reduce adverse environmental and social effects to acceptable levels. It specifically defines what actions must be taken and who is responsible to reduce project impacts. The ESMP also includes several component plans defining specific action programs for waste management, emergency response, closure and reclamation, community development, resettlement, and public consultation and disclosure. The ESMP highlights the issues and concerns that are presented in the ESIA and identifies reasonable and practical responses to address and mitigate potentially adverse effects. It describes the specific actions that will be required to effectively implement those responses in a timely manner and describes the methods by which management will demonstrate that those requirements have been met. It also establishes the course that will follow in complying with Government of Sierra Leone environmental laws and regulations as well as international policies and guidelines.

1.8.2 Management Plans featured in the ESMP

1.8.2.1 Environmental Health and Safety Plan

The EHS Plan for the Project identifies the principles, approach, procedures and methods that will be used to control and minimize the environmental, social, health and safety impacts of all construction and operational activities associated with Project development.

1.8.2.2 Waste Management Plan (WMP)

The Waste Management Plan (WMP) describes the procedures, systems, equipment, and structures specific to waste management and disposal. Waste generation should be limited at all levels of the project in order to decrease the volume of waste generated and make waste disposal more manageable. The WMP also defines who is responsible for developing and implementing the plan, and what records and reporting will be required.

1.8.2.3 Emergency Response Plan (ERP)

The Emergency Response Plan (ERP) provides employees and managers with specific instructions that will allow them to respond quickly and efficiently to any foreseeable emergencies likely to occur at the Project. It is developed using recognized and accepted methods and practices and includes specific responses, protocols, and management contacts. The ERP essentially has the goal of protecting people, the environment, property and the operations.

1.8.2.4 Closure Plan (CP)

The Closure Plan documents plans required to chemically stabilize the site, as well as physically stabilize the ponds, tunnels and removal of aboveground structures, including processing facilities. Reclamation activities are implemented to re-establish a beneficial post-operation land use.

1.8.2.5 Community Development Action Plan (CDAP)

The Closure Plan documents plans required to chemically stabilize the site, as well as the removal of underground and aboveground structures, including processing facilities. Reclamation activities are implemented to re-establish a beneficial post-operation land use.

1.8.2.6 Public Consultation and Disclosure Plan (PCDP)

The PCDP is intended to define objectives and establish the framework necessary to provide understandable information to all parties involved. This plan will be implemented to ensure timely and effective communications the project Management and the affected stakeholders. The main objective of the PCDP is to establish a program for multi-directional communication between the management and stakeholders.

1.8.2.7 Environmental Monitoring Plan

The Environmental Monitoring Plan (EMP) outlines a comprehensive monitoring plan.

2 PROJECT DESCRIPTION

2.1 Background

Odhav Multi Industries is the first fully automated steel manufacturing company in West Africa and it was founded in in Massaya (Dubreka), Republic of Guinea. Odhav Multi Industries has an annual steel

production capacity of 200,000MT. The company wants to expand its business to other countries with the establishment of Odhav Multi Industries (SL) Limited (hereinafter referred to as Odhav) in Sierra Leone. Odhav signed a $240 million investment agreement with Sierra Leone's Ministry of Trade and Industry in 2021 with plans of developing a Steel Manufacturing and Processing plant on 160 acres of land in Songo, Koya Chiefdom, Port Loko. The first phase of three phases of the project for which this ESIA is being done involves the construction of the plants and factory worth $40million.The company plans on buying and recycling scrap steel from local vendors to manufacture finished products like iron rod, nails, roof sheet, pipes, binding wires etc. The project will cater for a market size of 350,000,000 and job creation for 1200 employees within the ECOWAS region.

2.2 Planning and Design Phase

The Steel Manufacturing industry uses both recycled and traditional raw materials such as iron ore, coal and limestone in the manufacturing process. Most steel manufactured today is done using two processes which include:

- Basic Oxygen Steelmaking (BOS)
- Electric Arc Furnaces (EAF)

The typical steel manufacturing process is described below and illustrated in figure 2-1

- Iron-making- The step involves the melting of the raw materials including iron ore, coal and lime in a blast furnace which results in the formation of molten iron. The molten iron is brittle due to carbon and other impurities which need to be removed.
- Primary Steel Making- The impurities in the molten iron are removed in this step using either BOS or EAF methods to produce the raw steel. The BOS method uses scrap steel which is added to molten iron in a convertor with oxygen blown through it at high temperatures to reduce the carbon content. In the EAF method, the scrap metal is converted into high quality steel by feeding it through high-power electric arcs.
- Secondary Steel Making- In secondary steel making, the raw steel is treated in different ways to obtain different grades of steel. This smay include altering the element content, temperature and/or the production environment.
- Continuous casting- the molten steel is hardened at this step by casting it into cooled moulds. The solidified steel is then cut into desired length depending on its future application.
- Primary forging- The cut steel is transformed into different shapes through hot rolling to get rid of defects and give the shape and surface quality desired.
- Secondary Forming- The final shape and properties of the steel is obtained at this step through different techniques including tempering (heat treatment), welding (joining), shaping (cold rolling), coating (galvanising), machining (drilling) and carburizing (surface treatment).

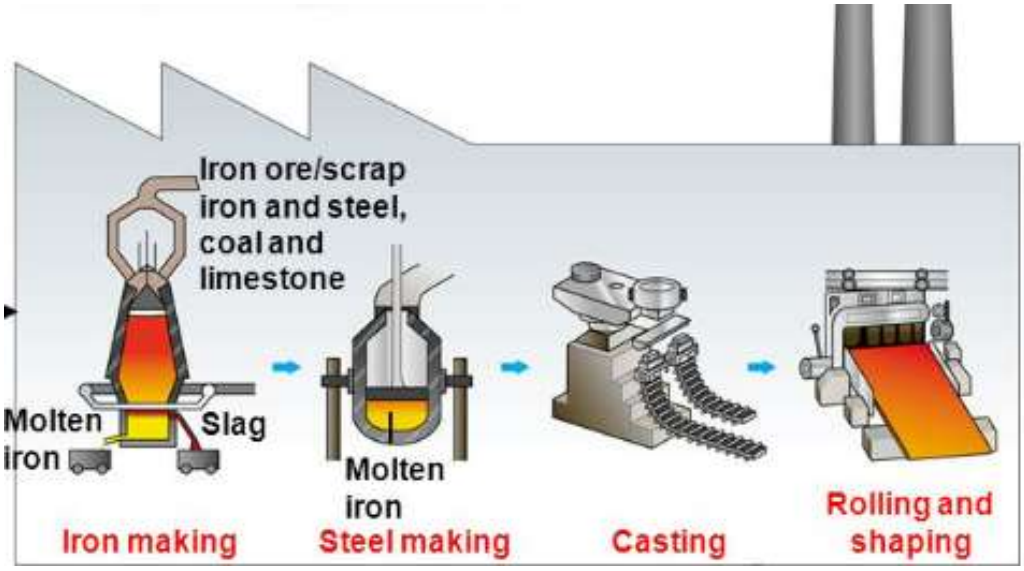

Figure 2.2-1: The Steel Manufacturing process

2.3 Construction Phase

The construction phase will include the erection of the following plant infrastructure:

- Factory area for Steel plant (Raw Material Handling system, Blast furnaces, mills, coke-oven plant, oxygen furnace)
- Offices/Admin building
- Clinic
- Residential building
- Workshop
- Warehouse/storage area
- Security post
- Restrooms
- Carpark
- Weighing bridge

2.3.1 Construction and Installation activities typically associated with a Steel Manufacturing Facility

2.3.1.1 Clearing of the Project site

This involves clearing the trees and vegetation at the project site to allow access of the equipment to be used at the site and for construction work to begin.

On completion of construction, disturbed areas that haven't been constructed on will be restored.

2.3.1.2 Preparation of Work Area

Access roads and paths to different plant infrastructure will need to be created within the project site for personnel, vehicle and equipment access. The site area will also need to be levelled to create stabilized areas that can accommodate construction equipment.

2.3.1.3 Construction of boundary wall and security posts

A boundary wall demarcating the extent of the project site will be constructed before plant construction commences to ensure that possible community disturbances caused by project construction are limited to within site boundaries as much as possible and to ensure the safety of the site. Security posts to accommodate site securities will also be erected.

2.3.1.4 Construction of Concrete preparation plant

The civil construction work at this site will be ta a large scale therefore a concrete preparation plant will be needed for more efficient construction work.

2.3.1.5 Preparation of foundations

Foundations will be designed and constructed to carry the expected load of each plant structure with the soil parameters and depth of water level below taken in consideration.

2.3.1.6 Fabrication of Building structures

The fabrication of building structures will start while the foundation preparation is ongoing so it will be ready for installation once foundations are ready.

2.3.1.7 Installation of equipment and structures

Prior to installation of equipment and structures, cranes and other handling equipment would have been erected to facilitate the process. Equipment erection will be carried out by an erection contractor as per the erection manual provided by the supplier. When the foundation is cured, the fabricated plant structures will be installed by the contractor.

2.3.1.8 Access Road

The project site already has an access road connecting it to main highway, therefore the transporation of equipment, materials and personnel to and from the site will not require a new road construction. However, the access road may need to be expanded and graded/tarred to facilitate movement especially in the rainy season.

2.3.1.9 Water Requirements

Water for the project will be sourced from local water sources including a steam that runs through the project site (Bondo water stream) and other nearby streams using water bowsers. The construction phase of the project will require the abstraction of water in large quantities therefore, it needs to ensures that neighbouring communities are not deprived of water accessibility and availability. Drinking water will be purchased from water vendors within the surrounding communities.

2.3.1.10 Energy and Fuel Requirements

Diesel powered generators will be used on site during construction and operation of the plant.

2.3.1.11 Chemical Requirements

Chemicals commonly used in steel making include manganese, nickel, chromium, carbon, vanadium and hydrochloric acid/sulphuric acid. Chemicals will be stored in a chemical storage room with access strictly limited to specified personnel. The store room be well illuminated so labels can be easily read and clearly marked and unobstructed exits with shelves firmly secured to walls. The store room

environment will be controlled to avoid extreme temperatures and humidity and the floors will be kept clean and dry. Large containers will be stored on lower shelves and no chemicals should be stored above eye level or on the floor.

2.3.1.12 Waste Management

The Waste Management Plan can be found in the Environmental Social Management Plan and describes the procedures, systems, equipment and structures specific to waste management and disposal. Waste generation is expected to be considerably higher during the construction phase of the project and will mostly include construction waste (metal scraps, excavated soil, waste oil), municipal solid waste, wastewater and sewage. Waste generation during operations will be minimal and for the most part limited to municipal solid waste as almost all the waste generated during the manufacturing process will be recycled. Waste generated during manufacturing includes slag, metallic waste, acids and sludge treatment waste. The Waste management plan defines who is responsible for developing and implementing the plan, and what records and reporting will be required.

2.3.2 Construction Machinery and Equipment

The following equipment and machinery will be utilised for the construction works and installation of the equipment and structures.

Table 2.3-1: Construction Machinery and Equipment

Construction/ Installation Aspect	Required Equipment/ Machinery
Survey works	Total Station and DGPS
Work area preparation	Dozers, excavators, backhoe trucks, compactors, graders, loaders
Soil Investigations	Drill Rig for SPT
Foundations	Concrete mixers, trucks, excavators, vibrators, cutters, grinders
Equipment Erection	Boom trucks, Truck, pick up vehicle, Crane, Pulleys, ropes
Store	Cranes, fork lift, pick up vehicle, truck

2.3.3 Occupational Health and Safety

In order to ensure the health and safety of all workers on the project, the following steps will be taken:

- A full-time safety manager will be appointed for the project, and safety stewards assigned in all active project sites.
- Suitable personal protective equipment (PPE) will be provided for all individuals entering active project sites, and their use enforced.
- Induction training will be given to newly recruited workers before being assigned to site works.
- Frequent training programmes will be conducted for all site activities
- Method statement and safety instructions during all site activities will be developed, circulated and followed up during construction activities.

- Toolbox talks will be conducted every morning for each site team and the risk involved will be discussed, analyzed and mitigated.
- Near miss and incidences (if occurred) will be closely monitored. Rectification and preventive measures will be immediately established.
- All equipment, vehicles will be regularly inspected and maintained for safe performance.

2.4 Operations Phase

The operation of the plant will involve the handling and storage of raw materials including ore, coal, coke, etc. that are used in the Manufacturing process. Manufacturing activities will have an effect on the environment in varying degrees depending on the type of activity. These effects may include the depletion of natural resources, water consumption and contamination of waterbodies, release of particulate matter and gaseous emissions into the atmosphere, wastewater runoff, etc. The air, water and noise levels will be affected by the different activities including steel processing, material transportation, workshop, garage and canteen operations, etc. during operations. These negative impacts will need to be mitigated. Conversely, the operation of the plant is bound to bring positive impacts to the project affected communities through socio-economic development. These impacts include increased employment, community infrastructural development, etc.

The project activities during the Operations phase include:

- Manufacturing activities of the different plants
- Handling and storage of raw materials
- Transportation of raw materials, finished products and personnel
- Water supply, storage and treatment
- Management of solid waste and wastewater
- Management of gas emissions

The sources of pollution envisioned during the Operations phase include:

- Furnace and boiler gases
- Air emissions from the manufacturing process and movement of vehicles and equipment
- Noise from the manufacturing process (turbine, fans, etc.), vehicle and personnel noise
- Solid waste handling and storage
- Wastewater

The affected Environmental parameters include:

- Surface and Groundwater quality
- Noise levels
- Air quality
- Socio-economics

3 ANALYSIS OF PROJECT ALTERNATIVES

3.1 Introduction

In accordance with current ESIA good practice, it is appropriate for the ESIA to review alternatives considered during planning of the project, and to explain why the proposed project has been selected, including any environmental considerations. The aim is to establish whether there are reasonable alternatives which could be pursued which meet the project's objectives with less impact on the environment, and if there are, to explain what other factors determined the choice of proposal.

3.2 The "No Project Option"

The "no project option" means that the project will not be done implying that the project's associated impacts including health, safety and environmental impacts will be avoided. However, this option also means that associated benefits will not be realized. This option is typically considered when the proposed development is expected to have significant negative impacts that cannot be effectively mitigated. In considering this "no project" option, the following were evaluated:

- Use of Natural Resources- Odhav proposes the recycling of scrap metals into steel products, however, some amount of depletion of natural resources such as water, land, etc. is expected in the construction of infrastructural facilities and in the operations of the factory.
- Environmental Impacts- as with any project of this nature, there will environmental impacts both adverse and beneficial during all phases of the projects. However, these issues have been identified and evaluated in consultation with identified stakeholders. Detailed mitigation measures have been proffered in this ESIA report. Incorporating the ESIA findings and implementing the ESMP will ensure that the adverse impacts are mitigated and managed to acceptable levels.
- Benefits to the society- Considering the importance of the Manufacturing sector in particularly the Steel Industry's contribution to a country's GDP, the following are envisaged benefits as a result of Odhav's steel plant operations that would otherwise not be realized with the no project option:
    - More employment opportunities
    - Infrastructural development of the project area and the country as a whole
    - Provision of steel materials for other manufacturing industries
    - Provision of capacity building opportunities for employees
    - Enhancement of the economic status of the project area through the local sourcing of raw materials, aggregate, sand, scrap metals, etc. used in construction and in the manufacturing process.
    - Community Development opportunities through Odhav's Corporate Social Responsibility initiatives.

- Increase socio-economic growth within the project area as the plants' operations will open up new market opportunities as well as improve social services within the project area.
- The influx of people into the project area as a result of the establishment of the plant will.
- Increase the availability of steel materials in the country which means decreased need for importation,
- Attract government and private sector investments in industries and infrastructural development.
- Other benefits as a result of Odhav's Corporate Social Responsibilty (CSR) to the host communities.

After evaluating the implications of the "no project" option in terms of its positive and negative impacts, this option has been rejected as the negative impacts of this project can be satisfactorily mitigated and managed through technically, environmentally and economically sustainable Management plans.

4 POLICY, LEGAL, REGULATORY AND INSTITUTONAL CONTEXT

4.1 Legal Framework

Table 4.1-1 presents the national acts, policies, and plans relevant to a project.

Table 4.1-1: Acts, Policies and Plans applicable to this Project

Related National Legal and Policy Framework	Discussion	Applicability to Project
Policies and Plans		
National Environmental Policy, 2013	This National Environmental Policy seeks to achieve sustainable development in Sierra Leone through the implementation of sound environmental management systems which will encourage productivity and harmony between man and his environment. It also promotes efforts which will prevent or eliminate damage to the environment and biosphere and stimulate the health and welfare of nationals, and serves to enrich the understanding of ecological systems and natural resources important to the Nation. Thus, the key objective of the policy is to secure for all Sierra Leoneans a quality environment that can adequately provide for their health and well-being. The policy indicates intersectoral synergies in major areas for policy formulation. It takes into consideration major sector goals and policies for enhancing sustainability in environmental management systems. • Land Tenure, Land Use and Soil Conservation; • Water Resources Management; • Forestry and Wildlife; • Biodiversity and Cultural Heritage; • Sanitation and Waste Management; • Mining and Mineral Resources; • Working Environment (Occupational Health and Safety); • Gender Issues and the Environment; • Institutional and Government Arrangements; and • Legal Arrangement	This project will generate a number of environmental impacts which would require development and implementation of environmental management systems to effectively manage them.
The National Employment Policy and Action Plan, 2015	The Sierra Leone National Employment Policy and Action Plan (NEP-AP) sets out the principal employment strategies for 2015 to 2018. The policy document is based on consultation within and beyond government, and is intended to catalogue measures identified as important by key stakeholders in the labour market. The document is intended to serve the needs of Employers, Employees, jobseekers and groups facing labour market barriers.	The project will employ various levels of workers including professional, skilled and un-skilled (labour). If not properly approached, grievances are likely to arise which may affect project

Related National Legal and Policy Framework	Discussion	Applicability to Project
	The Action Plan, which is to be reviewed and updated annually, includes specific actions for both short-term and medium to long-term interventions including, but not limited to the following: • All major infrastructure public works projects should have employment conditionalities built into them, including a requirement to employ workers from the local areas. • Revive and create job centres at regional/district levels, managed and supervised by the Ministry of Labour and Social Security, to match demand and supply of labour. • Promote the use of local materials, goods and services and low-cost appropriate technology in production activities and development projects, as consistent with the new Local Content Policy, to promote local employment and create sustainable market linkages between the informal and formal sectors.	implementation. The NEP-AP provides some guidance for employers and employees alike.
The Sierra Leone Trade and Industrial Policy	The Sierra Leone Trade and Industrial Policy is a sectoral national policy. Its main goal is to promote a strong and competitive private sector and support growing production and service sectors to trade, at national and international levels, and contribute eventually to wealth and employment generation. The Policy discusses the issue of food security in the context of agriculture. It facilitates the development and diversification of agriculture in determining rural livelihoods and food security.	The project has the responsibility of complying with the content of this policy.
Disaster Management Preparedness Plan, 2006	As part of its post-war recovery effort, the GoSL reviewed its National Security Structure to meet the demands of the 21st century. This led the Government to enact the *National Security and Central Intelligence Act* in 2002 thereby mandating The Office of National Security to be 'the Government of Sierra Leone's primary Co-ordinator for the management of national emergencies such as disasters both natural and man-made'. The disaster Management Plan, 2006 is a comprehensive approach that enhances increased political commitment to disaster risk management, thereby encouraging government agencies to take the lead and supported by non-governmental organisations. It also promotes public awareness and the incorporation of disaster risk management into development planning. The Policy highlights the sources of funding and the reduction of bureaucracies in accessing such funds for effective disaster co-ordination.	Disasters likely to occur during a project of this nature may be manmade or natural – e.g., flooding, fire, landslides, etc. The Disaster Management Preparedness Plan aims to improve and incorporate disaster risk management into development planning.

Related National Legal and Policy Framework	Discussion	Applicability to Project
	The Policy document emphasizes the following: • Ensure the integration of disaster risk management into sustainable development programmes and policies to ensure a holistic approach to disaster management; • Ensure priority and requisite institutional capacities for disaster risk reduction at all levels; • Enhance the use of knowledge, education, training, innovation and information sharing to build safe and resilient societies; • Improve the identification, assessment, monitoring and early warning of risks, and • Improve effectiveness of response through stronger disaster preparedness.	
National Biodiversity Strategy and Action Plan, 2017	This National Biodiversity Strategy and Action Plans (NBSAP) for Sierra Leone has been formulated since 2003 (NBSAP 2004-2010) to stem the alarming rate of loss of biodiversity and degradation of ecosystems in various ecological belts in the country. A revised version was produced in 2017 effective for the period 2017-2026. Key lessons were learnt from the development of the NBSAP 2004-2010 fed into the review and development of the NBSAP 2017-2026. Additional priority thematic areas were identified and addressed, such as intellectual property rights and climate change, collaboration between stakeholders, the problem of overlapping mandates and conflict of interest among government agencies, *inter alia*. The reviewed strategy is consistent with two main categories, namely the thematic strategies and general measures, as guided by the Convention on Biological Diversity. The main themes are Wildlife, Forest Biodiversity, Agricultural Biodiversity, Freshwater, Marina and Coastal Biodiversity. The cross-sector strategies and cross-cutting issues include financial resources, policies, regulations and legislation, research and training, capacity building, public participation, planning, monitoring, conservation of protected areas, sustainable use, incentive measures, public education, impact assessment, access to technology, information exchange, sharing of benefits and indigenous knowledge.	The project involves clearing of vegetation which involves loss of local flora, and disturbance to and potential loss of fauna due to loss of habitat.

Related National Legal and Policy Framework	Discussion	Applicability to Project
Conservation and Wildlife Policy, 2010	The Conservation and Wildlife Policy was developed in recognition that the previous Wildlife Conservation Policy was in need of modernisation. Current legislation based on the Wildlife Conservation Act (1972) (as was the case of the previous Wildlife Conservation Policy) does not reflect the advances made in biodiversity conservation in the past four decades; it also does not take into account international obligations that arose after its entry into force, such as the Convention on Biological Diversity (CBD), the Convention on International Trade in Endangered Species (CITES) and the United Nations Framework Convention on Climate Change (UNFCCC). The Conservation and Wildlife Policy identifies that challenges to biodiversity conservation in Sierra Leone result from a lack of knowledge due to "recent conflict, land use change, uncontrolled exploitation of natural resources, and a lack of recent comprehensive inventory". The vision of the Policy document is to establish "an integrated wildlife sector that achieves sustainable, rights-based management of wildlife resources for biodiversity conservation inside and outside wildlife conservation areas which benefits present and future generations of Sierra Leone and humankind in general." The Policy presents a plan for biodiversity conservation based on a set of "Policy Statements" outlining concrete Policy goals and develops the necessary institutional arrangements for Policy implementation.	The project involves some loss of flora and fauna, which requires control and monitoring to prevent excessive loss of biodiversity. The policy presents a plan for biodiversity conservation which will help guide project activities.
National Lands Policy, 2015	The Land Policy of Sierra Leone aims at the judicious use of the nation's land and all its natural resources by all sections of the Sierra Leone society in support of various socio-economic activities undertaken in accordance with sustainable resource management principles and in maintaining viable ecosystems. In specific terms, the objectives of this policy are to: • Ensure that every socio-economic activity is consistent with sound land use practices through sustainable land use planning in the long-term national interest; • Facilitate equitable access to and security of tenure based on available registered land; • Ensure the payment, within reasonable time of fair and adequate compensation for land acquired by government; • Provide laws that will protect citizen's right to land against Government;	The project involves land acquisition, resulting in loss of land by communities. The policy objectives apply directly to this aspect.

Related National Legal and Policy Framework	Discussion	Applicability to Project
	• Instil order and discipline into the land market to curb the incidence of land encroachment, unauthorized development schemes, multiple or illegal land sales, falsification and multiple registration of land documents, land speculation and other forms of land racketeering. For the purpose of sustainability of land use, it is stipulated in the following section 4.4 of the policy that: • Land categories outside Sierra Leone's permanent forest and wildlife estates are available for such uses as agriculture, timber, mining and other extractive industries, and human settlement within the context of a national land use plan; • Inland and coastal wetlands are environmental conservation areas and activities considered incompatible with their ecosystem maintenance and natural productivity are strictly prohibited; • All land and water resources development activities must conform to the environmental laws in the country and where Environmental Impact Assessment report is required this must be provided. Environmental protection within the 'polluter pays' principle will be enforced'; and • Provided that payment of adequate compensation in reasonable time will be made, government may acquire land wherever and whenever appropriate to, among other things: – Secure and control areas of urban expansion; – Facilitate urban renewal and redevelopment programmes; – Implement any rural or urban improvement programme; – Provide social infrastructure; – Supply promptly serviced or un-serviced lands at prices, which can secure socially and economically acceptable patterns of economic development; – Provide for the purpose of national defense, national security, national health and conflict-resolution; and	

Related National Legal and Policy Framework	Discussion	Applicability to Project
	– Protect areas of historical, cultural or ecological interest.	
Sierra Leone's Medium Term National Development Plan (2019-2023)	The Sierra Leone's Medium Term National Development Plan (2019-2023) outlines eight different policy clusters across sectors, which are connected to the Sustainable Development Goals (SDGs) 2030, the African Union Agenda 2063 and the New Deal Peace Building and State Building goals. They include: human capital development, diversifying the economy and promoting growth, infrastructure and economic competitiveness, governance and accountability, empowering women, children and people living with disability, youth employment and sports, and addressing vulnerabilities and building resilience. The main issues addressed by the clusters, applicable to this project include: • Cluster Three recognizes the importance of infrastructure for economic competitiveness and private sector promotion. It recognizes critical needs for investment in transportation systems, water infrastructure and ICT. • Cluster Five recognizes the importance of inclusiveness, equity and social protection through empowerment of women, children and people living with disability to promote inclusive growth and development. • Cluster Seven recognizes addressing climate and environmental vulnerabilities and building resilience to address spiraling environmental disasters in Sierra Leone. This includes mainstreaming climate and environmental issues and sustainable management of forests, wetlands, and improving disaster management governance.	The project is contributing to the country's 2023 goals through its contribution to the country's economy.
Acts		
The Constitution of Sierra Leone	Section 15 of the Constitution states that: "… every person in Sierra Leone is entitled to the fundamental human rights and freedoms of the individual." This includes protection from deprivation of property without compensation. Section 21(1) further stipulates that no property of any description	The section of the Constitution applicable to this project, has to do with the rights of the Sierra Leonean in relation to acquisition of property (land). It states the right of the Sierra Leonean, but

Related National Legal and Policy Framework	Discussion	Applicability to Project
	shall be compulsorily taken possession of, and no interest in or right over property of any description shall be compulsorily acquired, except where land is required by the GoSL in the public interest.	does not state the specifics of how those rights are to be applied.
Environment Protection Agency Act, 2022	The EPA Act is the government of Sierra Leone's overarching legislation that deals with the protection of the environment. The EPA-SL was established with a Board of Directors set up as its governing body. This Board consists of a Chairperson and representatives from various line Ministries, Departments and Agencies as stated in section 3 of part II of the Act. Subject to this Act, the control and supervision of the Agency is the responsibility of the Board, which acts in partnership and co-operation with other government agencies. Part VI of the Act exclusively deals with the activities and requirements of an EIA. This part of the Act emphasizes the processes and procedures leading to the acquisition of an environmental licence with respect to the conduct of fully acceptable EIA studies. It further stipulates the duties and obligations of both the environmental licenses' holder and the Board of Directors in the event that an environmental license is granted.	The project will generate environmental and social impacts during all phases of implementation as discussed in section 7 of this report.
The National Water Resource Management Agency Act,2017	The Act provides for the equitable, beneficial, efficient and sustainable use and management of country's water resources in order to establish a National Water Resources Management Agency. The Agency shall ensure that the water resources of the country are controlled in a sustainable manner through: • adopting natural river basin and aquifer boundaries as the basic units of management of water resources; • protecting the water resources for sustainability of the resource and protection of aquatic systems and recognizing the polluter-pays principle; • providing for existing customary uses of water and avoidance of significant harm to other users; • promoting the efficient and beneficial use of water resources in the public interest; • promoting community participation and gender equity in the allocation of water resources;	The project will involve the use of significant quantities of water, and has the responsibility of complying with the requirements of this Act.

Related National Legal and Policy Framework	Discussion	Applicability to Project
	• promoting conservation and recognizing the economic value of water resources; • reducing and preventing pollution and degradation of water resources. The Agency and other water institutions established by this Act shall in the performance of their duties be guided by the following principles: • consultation and participation of relevant state institutions, local communities, women and other relevant stakeholders' management of water resources at the lowest possible level; • administrative efficiency transparency and accountability; • promotion of integrated water resources management.	
The Consumer Protection Agency Act, 2020	The Act provides for the protection and promotion of interests of consumers for the establishment of the National Consumer Protection Commission and other related issues. It applies to the supply of goods and services in trade or commerce nationally. The commission appointed by the President shall perform the following functions: • Monitor the operation of consumer markets in Sierra Leone and consider improvements for the long term interests of consumers; • Conduct research on consumer protection policies, enactments and make recommendations appropriately; • Disseminate information to enable consumers acquire knowledge of consumer rights and obligations and the skills needed to make informed choices about goods and services; • Liaise and exchange information, knowledge and expertise with consumer agencies in other countries.	Being a manufacturing project, delivering products to the public, the project is required to comply with the stipulations of this act.
The Standards Act ,1996	This act was established for the standardization of commodities and products in Sierra Leone. The standards Act gives the following mandates:	The project is required to ensure that its products meet the standards stipulated in this Act.

Related National Legal and Policy Framework	Discussion	Applicability to Project
	• Conduct tests on materials or products to ensure compliance with standards designated by the Council; • Undertake investigations where necessary into the quality of facilities, materials and products in Sierra Leone; • Calibrate and verify weights, measures, weighing and measuring instruments; • Compile an inventory of products requiring standardization; • Educate people on the benefit to industry and the public of the maintenance of acceptable standards in the manufacture of products; • Prepare and distribute standards samples; • Offer advice to government departments or local authorities on specific problems relating to standards; and • Assist industries and other related institutions in establishing in-plant standards.	
The Electricity and Water Regulatory Commission Act, 2011	It was approved on the 8th November 2011.This Act was established to regulate the provision of electricity and water services in Sierra Leone. The commission, appointed by the President shall consist a Chairman and the following members; • a representative of the Sierra Leone Institution of Engineers; • a representative of the Sierra Leone Labour Congress; • a representative of the Sierra Leone Consumer Protection Agency; • four other persons with formal qualifications, extensive knowledge and experience relevant to the functions of the Commission, two each from the electricity and water supply sectors respectively; and • the Director-General appointed under section 22. The Commission is responsible to perform the following functions: • regulate the provision of the highest quality of electricity and water services to consumers;	The project will involve the use of water and electricity, and is subject to guidelines put in place by the Commission.

Related National Legal and Policy Framework	Discussion	Applicability to Project
	• renew, amend, suspend, revoke and cancel licenses as the case may be; • provide guidelines on rates chargeable for provision of electricity and water services; • monitor standards of performance for provision of electricity and water services; • promote fair competition among public utilities; • make valuation of property of public utilities for the purposes of the Commission; and to • maintain a register of public utilities.	
The Sierra Leone Local Content Agency Act, 2016	The Act establishes the Sierra Leone Local Content Agency to provide for the development of Sierra Leone Local Content in a range of sectors of the economy such as industrial, manufacturing, mining, petroleum, marine resources, agriculture, transportation, maritime, aviation, hotel and tourism, procurement of goods and services; public works, construction and energy sectors; to promote the ownership and control of productive sectors in the economy by citizens of Sierra Leone. Prime objective of the Agency is to promote Sierra Leone local content development by effectively and efficiently managing the administration and regulation of Sierra Leone local content development in Sierra Leone. The Act makes provision for a Sierra Leonean Content Plan to be produced by companies operating in Sierra Leone, to demonstrate compliance with the local content policy requirements. The Plan must indicate "how an operator gives first consideration to Sierra Leonean companies, materials, goods and products, including specific examples showing how first consideration is considered and assessed in evaluation of bids for materials, goods and products required by the project, operations or activity."	This Act is applicable to the employment aspect of the project. The project would need to prepare a Sierra Leone Local Content Plan to demonstrate compliance with the provisions of this Act.
Local Government Act, 2004/2017	This Act deals with the establishment and operation of local councils around the country to enable meaningful decentralization and devolution of Government functions. It stipulates that a local council shall be the highest political authority in the locality and shall have legislative and executive powers to be exercised in accordance with this Act or any other enactment. It shall be responsible, generally for promoting the development of the locality and the welfare of the people in the locality with the resources at its disposal and with such resources and capacity as it can mobilize from the central government and its agencies, national and international organisations, and the private sector. The	The project involves community stakeholder consultations and development of Community Development Action Plans. The Local Government Act provides information on the local administrative structure and the interrelationships.

Related National Legal and Policy Framework	Discussion	Applicability to Project
	local council should initiate and maintain programmes for the development of basic infrastructure and provide works and services in the locality. A local council shall cause to be prepared a development plan which shall guide the development of the locality. Many companies are bound to operate within areas controlled by one local council or another. There is also a relationship between the local council and the Chiefdom within which a company operates. It is advisable for companies to involve local councils in their development work. The schedules to the Local Government Act outline the activities of various MDAs that have been devolved to local councils.	
The National Land Commission Act, 2022	This Act provides for the establishment of the National Land Commission, the District Land Commission, and other land administrative bodies to secure effective and holistic land administration, and to provide for other matters. The objective of the District Land Commission is to provide technical support to Chiefdoms and other land committees in the management and administration of customary land in their respective districts. The Chiefdom Land Committee shall manage communal chiefdom lands in their chiefdom.	A component of this project is related to land acquisition for the project, and the resulting loss of land by communities.
The Customary Land Rights Act, 2022	This Act provides for the protection of customary land rights (land owned, governed by or administered under customary law in the provinces), the elimination of discrimination under customary law, and the management and administration of land subject to customary law. The Act states the following: • A citizen shall not be refused the right to hold, use or acquire land that is subject to customary law based on that citizen's gender, tribe, religion, ethnicity or age; • GoSL shall ensure equity transparency and accountability in the allocation and management of land rights • The Chiefdom Council, through the Chiefdom, Town or village area land committees shall have oversight responsibility over land in the respective chiefdoms in the provinces	A component of this project is related to land acquisition for the project, and the resulting loss of land by communities.

Related National Legal and Policy Framework	Discussion	Applicability to Project
	• An investor wishing to investment on any land subject to customary law shall comply with processes and procedures set out in this Act and procedures set out by the body responsible for national investment. • A non-citizen or foreign company shall not acquire a lease hold interest in land subject to customary law for a period exceeding 50 years. • An investor shall not-infringe on the rights or interests of lawful occupiers of land, and shall pay the lawful occupier prompt and adequate compensation for any disturbance of their rights or interests.	
The Forestry Act, 1988	The *Forestry Act*, which first came into effect on 1st July 1988, mandates the Forestry Department to take steps to ensure compliance with the provisions of the Act. It mandates the Director of Forestry or his representatives to enforce the legislation. The following activities in a forest reserve are considered offences under Sierra Leone forest laws: • Establishing or carrying on a forest industry in or with resources of the core forest: charcoal burning, wood cutting, hunting, stone or soil deportation; • Clearing, cultivating or breaking up land for any reason; • Removing soil, sand or gravel; • Erecting a building or shelter in the core forest or its buffer zone; • Lighting, keeping or carrying fire; • Carrying a firearm, pasturing cattle or permitting them to trespass; • Damaging, altering or removing any notice board, land-mark or fence; • Assaulting or obstructing any person carrying out his/her duty under the Forestry Act e.g. Forest Guards, and • Altering, defacing or obliterating any mark placed on timber by a forest officer. The maximum penalty under the Forestry regulations is Le5,000,000 or one-year imprisonment. Once convicted, an offender can also lose the equipment that was used to carry out the offence, as the court	The project site does not occur within a designated forest, but does involve felling of trees.

Related National Legal and Policy Framework	Discussion	Applicability to Project
	may order that it be forfeited to the state in addition to the imposition of a fine or term of imprisonment.	
Wildlife Conservation Amendment Act, 1990	The *Wildlife Conservation Act, 1972* and the *Forestry Act, 1988* are the main legislation that deal with issues of biodiversity conservation in Sierra Leone. It provides for the establishment, conservation and management of National Parks, Game Reserves and other forms of Natural Reserves. Specific provisions dealing with the protection, management and conservation of these areas and the limitations therein are highlighted in Part II of the Act and include the following: • Prohibition of all forms of hunting, capture and other activities leading to the injury of wild animals; • Destruction of any plant form by any means including fire; • Fishing within these protected areas; • Erection of structures, construction of dams, forestry, agriculture, mining or prospecting activities, and • Introduction of species from outside of the boundaries of the reserve. The *Wildlife Conservation Act (1972)* saw minor amendment in 1990 (known as the *Wildlife Conservation Amendment Act*), which included redefinition of terms, and other modifications and qualifications. For example, the prohibition of hunting of elephants which was limited to protected areas in the 1972 Act was extended to include all forests. The 1990 *Amendment Act* provided for change of name from Forestry Department to Forestry Division. The Wildlife Regulations of 1997 however makes provision for the acquisition of licences or permits for hunting in such designated areas and for other purpose as may be prescribed.	The project involves some loss of flora and fauna, which requires control and monitoring to prevent excessive loss of biodiversity. The Act presents instructions and provisions for wildlife conservation which will help guide project activities.

4.2 Regulatory Institutions

Institutional Stakeholders for a project of this nature are discussed in Table 4.2-1

Table 4.2-1: Institutions Regulating the Project

Institution	Summary
Ministry of Trade and Industry	The Ministry of Trade & Industry is the lead policy advisor to government on trade, industrial and private sector development with responsibility for the formulation and implementation of policies for the promotion, growth and development of domestic and international trade and industry. The Ministry has the sole mandate of developing policies and programmes to stimulate local and export trade as well as to enhance private sector investment, industrial and economic growth.
Electricity and Water Regulatory Commission	To aid the Ministry in its tasks of ensuring reliable, efficient, effective, and affordable power generation and distribution, the government established the regulatory Commission known as the Sierra Leone Electricity and Water Regulatory Commission in 2011. The Commission is in place to regulate the provision of electricity and water services and to provide for other related matters. Section 2 (1) of the Sierra Leone Electricity and Water Regulatory Commission Act provides that "Subject to this Act, the Commission shall have power to- (a) set or otherwise determine rates for electricity and water services; and (b) carry out regular reviews of rates and charges for regulated and unregulated services.
The Ministry of Environment and Climate Change	The Ministry of the Environment was formed in 2019. The Environmental Sector, before then, used to be under the purview of the Ministry of Lands, Country Planning and the Environment. The mission of the Ministry of the Environment is to manage the environment in a sustainable manner by formulating and facilitating implementation of appropriate policies and programmes for the management and preservation of the Environment in Sierra Leone. The general mandate of the ministry is to ensure that all sectors of Sierra Leone value and undertake sound environmental management and prudent use of natural resources based on good environmental governance, in order to contribute to the national aspirations for poverty alleviation and sustainable development in Sierra Leone.
The Environment Protection Agency Sierra Leone	The EPA-SL was established through the *SLEPAA (2008)* and became operational in 2009. It is the main government agency in charge of all issues concerning the environment and climate change. The EPA was established with the goal of creating and enforcing a strict regulatory framework for environmental regulation in Sierra Leone. It has the mandate to coordinate, monitor and evaluate the implementation of national environmental policies, programmes and projects, including issuing EIA licences.

Institution	Summary
Ministry of Lands, Housing and Country Planning	This Ministry develops appropriate policies and programmes for lands and country planning and carries out activities under the following major headings: • Land and Land Tenure; • State Lands; • Surveys, Mapping and Triangulations; • Relations with the Directorates outside Sierra Leone; • Geodetic and Topographical Surveys; • Enforcement of planning and building control; • Demolition of unauthorized structures, and • Collaboration with relevant Government Ministries and with national and international organisations and Institutions.
Ministry of Works and Public Assets	This ministry is responsible for the development of appropriate policies and programmes for the improvement of public infrastructure. The ministry includes an infrastructure division which is responsible for the development of a National Infrastructure Policy in collaboration with line ministries and proffers professional service advice to all ministries, departments, agencies, and private sector entities that are involved in infrastructure development, including electricity supply, water supply sewage system sanitation.
The Ministry of Finance	The Ministry of Finance is a Key arm of the Government of Sierra Leone mandated to formulate and implement sound economic policies and public financial management, ensure efficient allocation of public resources to promote stable economic growth and development in the context of a stable macroeconomic environment.
Ministry of Local Government and Rural Development	The Ministry's mission is to ensure democratic local governance responsive to the aspirations of the people in promoting good governance, maintenance of peace, and the provision of services to improve the welfare of the people and eradicate poverty in Sierra Leone. The mandates of the Ministry include the following: • Provide an effective link between national development priorities and local level development initiatives. • Build Local Councils' capacities to lead and coordinate key actors to leverage local economic growth and provide infrastructure for economic activities in their respective localities. • Strengthen coordination between and among Ministries, Local Councils and Service Delivery Agencies, to bring about more effective service delivery for local people across the country.
Ministry of Labour and Social Security	The Ministry oversees the employment condition of Sierra Leonean workers, with Directorates aimed at addressing:

Institution	Summary
	• Policy, Planning and Research • Labour and Employment • Occupational Health and Safety The ministry conducts periodic inspections, issues work permits, and addresses industrial disputes, among many other functions.
The National Water Resources Management Agency	The Agency started operations in February 2019, underscoring the government of Sierra Leone's commitment in actualizing the National Water Resources Management. The National Water Resources Management Agency (NWRMA) has the mandate to manage and safeguard water resources at local, national and transboundary in Sierra Leone. The Agency also contributes to safeguarding domestic water supplies and work with other industries to protect the environment. To that end, the agency fulfils the following aims; • To understand and report on the state of water resources and promote the importance of managing water resource • To enforce water resources law and support the delivery of effective regulation. • To provide for the establishment of a Water Basin Management Board and Water Catchment Area Management Committees for the management of the water resources and for other related matters. It is anticipated that the Agency will be developing a water resources management system, which may include licensing of large-scale water users and industries.
The Sierra Leone Electricity and Water Regulatory Commission	To aid the Ministry in its tasks of ensuring reliable, efficient, effective, and affordable power generation and distribution, the government established the regulatory Commission known as the Sierra Leone EWRC in 2011. The Commission is in place to regulate the provision of electricity and water services and to provide for other related matters. Section 2 (1) of the Sierra Leone Electricity and Water Regulatory Commission Act provides that "Subject to this Act, the Commission shall have power to- (a) set or otherwise determine rates for electricity and water services; and (b) carry out regular reviews of rates and charges for regulated and unregulated services.
The Sierra Leone Local Content Agency	The Agency was established to provide for the development of Sierra Leone Local Content in a range of sectors such as industrial, manufacturing, mining, petroleum, marine resources, agriculture, transportation, maritime, aviation, hotel and tourism, procurement of goods and services, public works and construction. The prime objective of the Agency is to promote development by

Institution	Summary
	effectively and efficiently managing the administration and regulation of local contents in Sierra Leone.
The Sierra Leone Standards Bureau (SLSB)	SLSB was created by the Standards Act No 2 of 1996, with the responsibility of coordinating Standardization and Quality Management activities in Sierra Leone. SLBS is also mandated by the Weight and Measures Act No 5 of 2010 to authorise and validate the use of the metric system of measurement and the management of national standards and quality of goods in the Country.
The Consumer Protection Agency	The Agency was established for the protection and promotion of consumer markets in Sierra Leone. The aim of the Agency is to ensure fair, competitive and responsible markets that protect Sierra Leonean consumers and promote ethical business practices.

4.3 International Guidelines and Conventions

4.3.1 International Guidelines

Various international guidelines exist relating to environmental and social safeguards for projects, and apply to projects funded by International donors. The guidelines discussed in this section have a bearing on the project.

4.3.1.1 International Finance Corporation (IFC)- Environmental, Health and Safety Guidelines- for Integrated Steel Mill

The IFC Performance Standards are an international guide for recognising and managing environmental and Social risks in order to achieve good industry practice. The framework offers understanding for managing environmental and social risks for potentially high impact projects. Together, IFC Performance standards encompass eight key environmental and social topics including:

- PS1 - Environmental and Social Assessment and Management System
- PS 2- Labor and Working Conditions
- PS 3 - Pollution Prevention and Abatement
- PS 4 - Community Health, Safety and Security
- PS 5 - Land Acquisition and Involuntary
- PS 6 - Biodiversity Conservation and Sustainable Natural Resource Management
- PS 7 - Indigenous Peoples
- PS 8 - Cultural Heritage

The Performance Standards provide guidance on how to identify risks and impacts, and are created to help avoid, mitigate, and manage risks and impacts in a sustainable way.

The IFC Environmental, Health and Safety Guidelines for Integrated Steel Mills provide industry specific EHS issues associated with steel manufacturing and recommendations for their management.

It includes information relevant to the manufacture of pig iron and raw or low-alloy steel from iron ore and iron-based alloys. It is applicable to the manufacture of metallurgical coke, primary iron and steel production in Blast and Basic Oxygen furnaces (BF and BOF), scrap metal recycling in the electric arc furnace (EAF) process, production of semi-finished products and hot and cold rolling activities. The Environmental issues discussed in the guidelines include air emissions, solid waste, wastewater, noise, Community Health and Safety, and Occupational Health and Safety.

4.3.1.2 World Bank Environmental and Social Framework

The main focus of the Environmental and Social Framework (ESF) is on Sustainable Development, making important advances on the requirements that apply to the Bank for project financing. The framework recognises ten Environmental and Social Standards that supports green, resilient and inclusive development by enforcing protection of people and the environment. The ESF also place emphasis on strengthening national environmental and social management systems and institutions, and supporting Borrower capacity building. One of the key aims is to promote transparency and stakeholder engagement through meaningful consultations throughout the projects lifetime.

4.3.2 International Conventions

Sierra Leone is a party to many international agreements, conventions, and protocols that seek to protect the environment and ensure sustainable development. Table 4.3-1 presents a summary of these international commitments and agreements:

Table 4.3-1: International Conventions and Agreements to which Sierra Leone is Party

International Commitments and/Agreements	Republic of Sierra Leone
The UN Framework Convention on Climate Change (New York, 1992)	Yes +
The Kyoto Protocol is a protocol aimed at fighting global warming. The Protocol was initially adopted on 11 December 1997 in Kyoto, Japan and entered into force on 16 February 2005.	Yes +
Ramsar Convention for the Internationally Important Wetlands Especially as Waterfowl Habitats (1971)	Yes+
The Basel Convention on the Control of Transboundary Movements of Hazardous Waste and Their Disposal (Basel, 22 March 1989)	Yes+
Convention on the Environmental Impact Assessment in a Transboundary Context (EPS, Finland, 1991)	Yes+
Stockholm Convention on Persistent Organic Pollutants (22 May 2001; has not come into force yet)	Yes+
Convention on Biological Diversity (Rio de Janeiro, 1992)	Yes+
Convention on the Protection and Use of Transboundary Watercourses and International Lakes (Helsinki, 1992)	Yes+

International Commitments and/Agreements	Republic of Sierra Leone
Convention on International Trade in Endangered Species of Wild Flora and Fauna (Washington, 1973)	Yes+
Aarhus Convention on Access to Information, Public Participation in Decision-Making and Access to Justice in Environmental Matters (1998)	Yes+
Rio Declaration on Environment and Development (UN Conference, 1992)	Yes+

5 ENVIRONMENTAL BASELINE SURVEY AND CONDITION

The description of the existing environment includes primary and secondary data and information from all relevant and available sources, and the text is illustrated with summary tables of data, maps, graphs, photographs and detailed written descriptions.

During the baseline survey, observations and measurements were undertaken at different points within and around the project area.

5.1 General Description of Sierra Leone's Environmental Situation

5.1.1 Climate

Sierra Leone has a tropical savannah climate, with two distinct seasons resulting from migration of the Intertropical Convergence Zone that separates the warm dry air of the Sahara from moist air blowing northwards across the sea. Sierra Leone enjoys a tropical climate with a prolonged and abundant rainy season from May to November and is characterised by heavy rain (reaching a maximum of around 149.4mm in September). Due to the orientation of the coast and main mountain ranges the coastal regions are among the wettest regions in Africa receiving close to 3,000mm of rainfall per year. At the height of the Wet Season, rainfall can occur for several days without interruption and even on Dry days there is little sunshine because of heavy cloud cover. Thunderstorms occur in the transition periods between the two seasons, accompanied by short periods of strong winds and heavy rain. Rainfall decreases as the dry season progresses, until in January there is very little or no rain at all.

Temperatures are high and humidity fairly low in the dry season. The temperature is generally around 29.7 – 35.4 degrees centigrade in the day and 15.4 – 20.3 degrees centigrade at night. March is the hottest month when temperatures reach the annual maximum of 35.4 degrees centigrade. Conditions are modified by the harmattan, which is a dry, dust-laden wind, which blow south – west from the Sahara intermittently between December and March, for periods of up to a few days.

5.1.2 Ecology

Sierra Leone is a country that is known to have a high variety of natural resources including lowland rainforests, mountain forests, savannah woodlands, agricultural land, freshwater, and wetlands. The

country is on the West Coast of Africa with a total land surface area of 71,740 km^2 (27,699 sq miles)[1]. It has a north-south distance of 331 km and an east-west distance of 326 km. It is bounded on the west by the Atlantic Ocean, by Guinea – Conakry on the north and northeast, and by Liberia on the southeast.

Sierra Leone's ecology is dominated by two major biomes: the Sudan-Guinea savanna biome, which dominates most of the north to the north-west of the country, and the Guinea-Congo Forest biome, which spans the south to the north-eastern flank of the nation and is the westernmost extent of the Upper Guinea forest endemic area, make up Sierra Leone's natural environment. The zones that separate the northern and southern regions of these two large biomes are where mixed features of the two biomes are most common. The current distribution of vegetation reveals a significant area of degraded land, with bush fallows (agricultural bush) making up about 50% of the total area of the country. The Guinea-Congo Forest biome covers the country's east to south and is primarily made up of closed forest fragments that make up just around 3-5% of the total area which is far less than the projected 60% forest cover from more than a century ago. The largest areas of closed forest cover in the nation are found in the Gola Rain Forest National Park (71,070 ha), Loma Mountains National Park (33,201 ha), and Western Area Peninsula National Park (17,800 ha)[2]. These reserves are designated Important Bird Areas (IBAs) (Okoni-Williams et al., 2005), and so are among the key sites for biodiversity conservation in the country.

The vegetation in both biogeographic zones supports considerable species of flora and animals, including species that are of worldwide conservation importance (Birchall et al., 1979; Okoni-Williams et al., 2005; Klop et al., 2008). Among the more than 2000 species of vascular plants, the threatened flora comprises about 90 species from the threatened and near-threatened categories. The nation has 1,980 species of flora, of which more than 80 are vulnerable or near-threatened (GOSL, 2020). Some of these include numerous endangered and vulnerable species of mammals, birds, reptiles, amphibians, and fish, including the critically endangered Western Chimpanzee *Pantroglodytes verus* and Hooded Vulture *Necrosyrtes monochas*. These species' range is determined by habitat preference and appropriateness, however, most of the species are overexploited, leading to scarcity and isolated local extinctions, while natural ecosystems (both forest and savanna zones) have been and are being destroyed. As a result, many of the endangered species of plants and animals are limited to protected areas and a few other pristine ecosystems.

There are 48 forest reserves and conservation areas, representing about 4% of the land area (c. 180,250 ha). The total area of government wildlife reserves is estimated at 173,000 ha. There are over 2000 species of plants including 74 endemic species identified in SL. 15 species of primate, 18 species of antelopes and duikers, 9 bat species, and over 500 bird species have been recorded in the country. About 4,837.8 km2 of the country is covered by wetlands with vegetation that is typical of freshwater swamp forests, riparian, and mangroves.

[1] Mondal, P., Trzaska, S., & De Sherbinin, A. (2017). Landsat-derived estimates of mangrove extents in the Sierra Leone coastal landscape complex during 1990–2016. *Sensors*, *18*(1), 12.

[2] Okoni-Williams, A. D., Thompson, H. S., Koroma, A. P., & Wood, P. (2005). Important Bird Areas in Sierra Leone: priorities for biodiversity conservation. *Conservation Society and Government Forestry Division, MAFFS*.

5.1.3 Geology

Sierra Leone is situated on the Main Craton of the Southern West African Shield. The Archaean granitic shield contains elements of early sedimentary and mafic formations and a group of supercrustal greenstone belts with banded ironstone and detrital sediments.

Over half of Sierra Leone is underlain by early Archaean migmatites and gneisses which constitute the Precambrian Basement that forms part of the West African Craton. The diamond fields are situated almost entirely on the Archaean basement formation within the craton.

Resting apparently unconformably on the basement complex, are three groups of supercrustal rocks which constitute the Kasila Group, the Marampa Group and the younger Kambui Group these have been deformed and metamorphosed together with the underlying gneisses and intruded by late and post orogenic granites.

The Archaean records two major episodes of orogenic events resulting in deformation, metamorphism and granitic intrusions which are recognised in the basement complex. The younger of these events, is the Liberian orogeny at 2700Ma and the older in Sierra Leone, known as the Leonean orogeny at over 3000Ma trending east-west (E-W). A third episode, the Rokelide at 550Ma resulting in NW-SE trend and superimposed on the earlier deformation / orogenic events.

The Eastern half of Sierra Leone is underlain by these Archaean rocks whereas the Western half is underlain by Upper Proterozoic and Pan African mobile belts trending north to south and follows the coastline north into Guinea and east into Liberia along the western margin of the craton.

The basement granites and gneisses occupy over half of the country with medium grained brownish grey biotite granites, granodiorite and gneisses predominating. Foliations and faults in the basement granite are almost parallel and trending north-south to northeast-southwest.

The principal country rock type in the area is mainly granite /granodiorite gneiss, which contains metamorphic inclusions of amphibolites, ultra-basic schists, quartzites and granulites.

5.1.4 Hydrology

Sierra Leone is drained by seven major rivers which include the Little Scarcies, Great Scarcies, Rokel/Seli, Jong/Pampana, Sewa, Moa, and Mano rivers. The Little scarcies, Rokel/Seli, Jong/Pampana, Sewa and Moa rivers are perennial rivers that are characterized by wide shallow valleys which flood during the rainy season. These perennial rivers flow from northeast to southeast draining most of the country's land surface with peak flow in September and low flow occurring between February and April. Four of these rivers originate from neighboring countries with the Little Scarcies, Great Scarcies, and Moa rivers originating from the Fatou Jallon Plataeu in Guinea and the Mano river originating from Liberia. The Moa river is the longest river with a length of 424km while the Sewa river is the largest with a basin size of 19,022 km^2. Approximately 27% of the country is located in the Kittam basin (drained by Sewa and Waanje rivers), 18% in the Little Scarcies basin, 13% in the Moa basin and the Jong and Seli rivers each covering approximately 10% of the country (Ecreee, 2017)

The majority of Sierra Leone's groundwater originates from unconfined aquifers of limited extent. The aquifer's bottom layer is typically of crystalline basement at depths ranging between 15m to 80m. The unconfined aquifers are of three types including perched aquifers which run along large riverbanks, porous aquifers which can be found all over the country especially along the coast, and fractured aquifers found in the crystalline basement. The topography generally dictates the flow of the water

table which tends to flow northeast to southwest following the flow of the main water courses. Well yield in Sierra Leone typically ranges between 0.3 l/s to 1.5 l/s and in exceptional cases may range between 3 l/s to 6 l/s with a low rate of transmissivity.

Runoff is highly seasonal as a result of the seasonal distribution of rainfall. Discharge increases from May, peaking in September and decreasing to near-zero by March.

5.2 Description of the Project Area Environmental Situation

5.2.1 Air Quality

The baseline dust levels / Particulate Matter (PM_{10} and $PM_{2.5}$) in the air was recorded in thirteen (13) locations within and around the project site in September 2022. The measurements were recorded at different times of the day using the Series 500 Portable Air Quality Monitor (Aeroqual).

Figure 5.2-1: Air Quality Measurements on Site

Ambient air quality guidelines and standards for PM_{10} and $PM_{2.5}$ (i.e. particulates with an aerodynamic diameter of 10 µm and 2.5 µm or less) are presented in Table 5.2-1. PM_{10} provides a measure of nuisance dust, while $PM_{2.5}$ represents respirable dust, which has the potential to affect human health when inhaled.

Table 5.2-2 presents the results of instantaneous air quality data collected and compared to the following WHO air quality guidelines:

Table 5.2-1: WHO Maximum 24hr Concentration Air Quality Guidelines

Air Quality Parameter	WHO Maximum 24hr Concentration[3]
$PM_{2.5}$	15 µg/m^3
PM_{10}	45 µg/m^3

[3] WHO (2022). *2005 vs 2021 WHO Air Quality Guidelines*. [online] Available at https://www.iqair.com/newsroom/2021a-WHO-air-quality-guidelines

Whilst a direct comparison between the measured average values and the World Health Organisation (WHO) maximum 24-hour concentration or annual average concentration guideline levels is not possible, it provides some context to the observed pollutant levels.

Table 5.2-2: Air Quality Measurements

Location	Coordinates (UTM; 29N)	Date	Sample Duration	Particulate Matter (µg/m^3)	
				$PM_{2.5}$	PM_{10}
Project Site	726067; 926762	08/09/2022	30	9.5	11.5
	726086; 926608	08/09/2022	30	5.7	10.0
	726090; 926828	08/09/2022	30	8.8	12.0
	726157; 926844	08/09/2022	30	7.2	10.0
	726157; 926844	09/09/2022	30	3.8	5.4
	726257; 926867	09/09/2022	30	4.5	6.2
	726162; 926998	09/09/2022	30	4.2	5.8
	726088; 927009	09/09/2022	30	5.5	7.5
	726116; 927106	09/09/2022	30	5.4	7.6
	726175; 927080	09/09/2022	30	1.8	4.8
Makohloh	721451; 927888	07/09/2022	30	9.3	13.0
Songo	726938; 925980	07/09/2022	30	8.3	11.0
Konta Line	724699; 926665	08/09/2022	30	10.4	14.5

Particulate matter measurements show levels well below the recommended threshold. This can mainly be attributed to the fact that measurements were taken during the rainy season (although towards the tail end of the season), especially as some construction works were ongoing during the time of the visit, and the site is adjacent to a laterite road. Rainfall overnight and light showers during the day helped limit suspended dust in the air.

5.2.2 Noise Levels

Daytime noise levels (dBA) were measured at thirteen (13) locations in and around the project site during site visit in September 2022. The measurements were recorded at different times of the day

using a Sonus (GA116) class 1 sound level meter which was set to measure the LAq, LAE and LAF values over a 30-minute period.

Figure 5.2-2: Noise level measurements in Communities

Table 5.2-3 presents the IFC guidelines for maximum outdoor noise levels for different environments and times of day. While direct comparison between instantaneous measured noise values such as were taken during this assessment, and the one hour LAeq limits is not possible, it provides some context to observed noise levels and potential impacts.

Table 5.2-3: IFC noise level guidelines for maximum outdoor noise level dBA

Receptor	Noise level	
	One Hour L_{Aeq} (dBA)	
(Type of district)	**Daytime** 07:00 – 22:00	**Night-time** 22:00 – 07:00
(a) Residential; institutional; educational	55	45
(b) Industrial; commercial	70	70

At the time of taking these measurements development works were already underway, and the area could be considered as industrial; as such the LAeq values are compared to the IFC guidelines for daytime industrial areas. Values exceeding these guidelines are highlighted in red font. The data collected is presented in Table 5.2-4.

Table 5.2-4: Noise Levels Recorded in and around the Project Site

Location	Coordinates (UTM; 29N)	Date	Sample Duration	Particulate Matter (µg/m^3)		
				LAeq	LAF	LAE
Project Site	726067; 926762	08/09/2022	30	54.9	52.2	72.8
	726086; 926608	08/09/2022	30	45.5	46.6	65.1
	726090; 926828	08/09/2022	30	70.6	66.2	88.9
	726157; 926844	08/09/2022	30	37.4	35.3	53.8
	726157; 926844	09/09/2022	30	51.1	48.3	68.8
	726257; 926867	09/09/2022	30	47.7	45.7	70.9
	726162; 926998	09/09/2022	30	57.2	51.1	80.5
	726088; 927009	09/09/2022	30	49.5	40.7	72.4
	726116; 927106	09/09/2022	30	65.8	54.8	89.3
	726175; 927080	09/09/2022	30	63.2	66.1	84.0
Makohloh	721451; 927888	07/09/2022	30	59.6	56.0	82.1
Songo	726938; 925980	07/09/2022	30	61.5	60.3	84.2
Konta Line	724699; 926665	08/09/2022	30	55.0	52.2	77.1

Noise levels in almost all locations measured were within the recommended threshold, except for one exceedance on the project site where some construction works were underway. Measurements were also taken in project area communities, all of which are above the recommended levels for residential areas, however these exceedances cannot entirely be attributed to project activities.

5.2.3 Hydrology and Water Quality

A hydrological investigation was conducted to characterize the various types of surface and groundwater bodies in the project area. There are no major rivers near the project site, however there are a few streams and swamps, and a number of groundwater sources within the project area. One stream, locally named Bondo Water, flows on the edge of the project site boundary. This stream provides most of the water used for construction activities especially during the rainy season. When the stream dries up in the Dry season, water bowsers are used to collect water from other nearby

streams within the project area. Drinking water is bought from local water vendors in plastic sachets and bottles.

5.2.3.1 Project Site Hydrology

The project site is relatively flat with no proper drainage channels (at the time of the assessment). The soils at the project site were observed to be reddish and clayey suggesting an ultisol order. The combination of the site topography and the type of soil at the site means that not much infiltration takes place. Consequently, the site experiences a lot of surface runoff especially during the rainy season. With the lack of engineered drainage channels at the site, some of the surface water flows into the 'bondo water' stream while a large amount of it just settles in puddles within the site (Figure 5.2-3). The hydrological assessment was done during the rainy season and as a result, the site was extremely muddy and slippery with a number of puddles observed.

Figure 5.2-3: Pooling of water on site

5.2.3.2 Water Quality Assessment

In situ Physico-chemical water quality tests were carried out on the streams and wells within the three project communities of Makohloh, Songo and Konta Line. See Figure 5.2-4:

Figure 5.2-4: Bondo water stream running through the project site

Table 5.2-5: In-situ Physico-Chemical Water Test Results

Location	Source	Coordinates		Physio chemical properties							
		X	Y	Temperature (°C)	Oxidation Reduction Potential (ORP)	Electric Conductivity (mS/cm)	Total Dissolved Solids (mg/l)	Salinity (psu)	Turbidity (NTU)	Dissolved Oxygen (%)	pH
Makolo	Hand pump	725918	927998	28.6	214.6	456	293	0.14	0	43.7	6.53
Makolo	Bucket-rope	726088	928081	28.0	157.3	397	258	0.12	0	41.0	6.51
Makolo	Hand pump	726186	928122	27.8	214.9	79	52	0.03	0	41.2	6.46
Makolo	Hand pump	726216	928364	28.4	234.9	67	42	0.02	0	40.0	5.78
Makolo	Hand pump	725831	928207	28.1	245.3	33	21	0.01	0	33.6	5.42
Makolo	Hand pump	725992	927833	30.28	245.6	625	408	0.26	0	46.1	4.64
Makolo	Hand pump	726233	927619	28.5	276.2	118	76	0.04	0	38.6	4.76
Songo	swamp	727670	926334	27.5	183	22	13	0.01	2.4	42.1	6.97
Songo	well	727513	926325	27.4	176.4	49	31	0.02	0	44.2	5.90
Songo	Hand pump	727365	925851	27.9	218.4	75	48	0.02	0	47.7	5.13
Songo	Hand pump	727339	925749	28.8	187.1	99	63	0.03	0	44.6	5.72
Batbana (Songo)	Swamp	724554	926483	28.4	129.8	57	36	0.02	3.6	38.0	6.70
Bondo water (Odhav site)	stream	726342	926930	28.3	74.9	17	11	0.00	0.8	57.0	7.54

Discussion of Results

The results obtained in Table 5.2-5 are discussed in the following subsections:

Dissolved Oxygen

Dissolved oxygen (DO) is essential for aquatic organisms. A significant variation in dissolved oxygen concentration can be observed along a stream or river. The depletion of dissolved oxygen is primarily responsible for the ecological degradation of rivers and lakes. A high DO level in a community water supply is good because it typically makes drinking water taste better. Dissolved Oxygen Values for the samples ranges between 33.6% at a hand pump well in Makolo to 57% at the Bondo water stream that runs near the project site.

Turbidity

Turbidity is the measurement of the level of clearness in water. It is an optical feature of water and is an expression of the amount of light that is scattered by material in the water when a light is shined through the water sample. The higher the intensity of scattered light, the higher the turbidity. Turbidity can be caused by clay, silt, finely divided inorganic and organic matter, algae, etc. Drinking water should have a turbidity of 5 NTU or less. Turbidity of more than 5 NTU would be noticed by users and may cause rejection of the supply. Turbidityt almost all the wells sampled to 3.6 NTU at the Batbana swamp.

pH

This is the measurement of the hydrogen-ion concentration in the water. The WHO recommended permissible limit for potable water is 6.5 - 8.5. The pH values for the samples range from 4.64 at a handpump well in Makolo to 7.54 at the Bondo water stream running through the project site. Half of the samples tested fall below the World Health Organization threshold for potable water with pH values ranging from 4.64 to 5.78. These pH values mean that these samples were slightly acidic to acidic. The pH of water can be affected by natural and manmade factors. Natural changes are mostly due to interactions with surrounding rocks especially carbonate materials and limestone as well as changes in CO2 concentrations. Man-made causes are usually related to pollution in the form of acid rain which is as a result of emissions that come from mining operations or fossil fuel combustion. Pollution in the form of chemicals from agricultural runoff, wastewater discharge, industrial runoff and mining operations can also increase or decrease pH levels depending on the type of chemicals used.

Temperature

The temperature of water samples tested ranges from 27. 4°C in Songo to 30.28°C in Makolo. Water temperature will have an impact on other inorganic constituents and chemical contaminants that may affect the taste. High water temperature enhances the growth of microorganisms and may increase problems related to taste, odour, colour and corrosion.

Total Dissolved Solids (TDS)

Total Dissolved Solids (TDS) is the term used to describe the inorganic salts and small amounts of organic matter present in solution in water. Total dissolved solids (TDS) comprise inorganic salts (principally calcium, magnesium, potassium, sodium, bicarbonates, chlorides and sulphates) and some small amounts of organic matter that are dissolved in water.

The presence of dissolved solids in water may affect its taste. The palatability of drinking water has been rated by panels of tasters in relation to its TDS level as follows: excellent, less than 300 mg/litre;

good, between 300 and 600 mg/litre; fair, between 600 and 900 mg/litre; poor, between 900 and 1200 mg/litre; and unacceptable, greater than 1200 mg/litre (WHO, 1996). The value of Total Dissolved Solids for the samples tested range between 11mg/l at the Bondo water stream running through the site to 408mg/l at a hand pump well in Makolo. All samples tested with regards to TDS are considered excellent according to WHO standards except for one sample collected at a hand pump well in Makolo which is considered good.

Electrical Conductivity (EC)

This is a measurement of the ability of an aqueous solution to carry an electrical current. Pure water is not a good conductor of electricity. Because the electrical current is transported by the ions in solution, the conductivity increases as the concentration of ions increases. Thus, conductivity increases as water dissolves ionic species. EC depends on temperature, as more ions can be dissolved at higher temperatures. EC recorded ranges between 17µs/m at the Bondo water stream running through the site to 625µs/m at a handpump well in Makolo. All results are within WHO standards of less 300µs/m except three samples taken at wells in Makolo.

Salinity

Salinity is defined as the total solids in water after all carbonates have been converted to oxides, all bromide and iodide compounds have been replaced by chloride, and all organic matter has been oxidized (Shugar and Bauman 2001). The WHO recommended permissible limit for salinity is 0.4 ppt. The salinity of samples ranges between 0.00ppt at Bondo water stream running through the site to 0.26ppt at a hand pump in Makolo. Salinity values for all samples tested are within the WHO permissible limit.

5.2.4 Ecology

The project site does not fall in or near any ecologically sensitive areas such as protected forests or national parks. The site is uncultivated, rocky land, free from trees, with only shrubs and bushes present. It must however be noted that at the time of the assessment site clearing had already been done and construction works were underway.

5.2.4.1 Project Area Ecology

Songo Village is located within the Western Area Rural District. The region is located in Sierra Leone's biogeographic transition zone, where the southeastern Guinea-Congo Forest environment and the northern Sudan-Guinea savanna ecosystem meet. As a result, the region has pockets of forest ecology surrounded by a sizable tract of bushland, a high concentration of oil palm stands, and some remnants of derived savanna. According to the local vegetation, this region has a long history of intercropping oil palm production with several annual and biennial crops, like rice, cassava, and maize. The sacred groves that make up the forest's nooks are actually where the locals carry out their cultural and traditional practices. The following table presents summarised description of the site and surrounding ecology

Table 5.2-6: Description Summary of Project Site and Surrounding

SITE	GPS DATA 28P	Key features of core areas	Key features of the peripheral landscape
Plot 1	726283 /926880	In-valley swamp land with patches of savanna grassland	Degraded artisanal sand mined area.

SITE	GPS DATA 28P	Key features of core areas	Key features of the peripheral landscape
(Main project site entrance)		dominated by *Imperata cylindrica*, *Pennisetum purpureum,* and *Sesamum indicum*.	Farmbush regrowth inundated by *Elaeis guinensis*
Project site - Plot 2	726144 / 926606	A farm bush thicket dominated by *Andropogon tectorum* and *Elaeis guineensis* stands.	Farmbush fallows and some oil palm plantation mixed with an acacia tree. Few stands of trees in a somewhat grassy environment.
Plot 3	726025 / 927070	Degraded Land dominated by *Oplismenus hirtellus, Pennisetum purpureum,* and *Axonopus compresus*.	Some secondary growth and cultivated swamps
Plot 4	735446 / 986554 Elevation 26 m asl	No Vegetation, as the land had already been cleared and burned, but about 20 meters away from the site there is a farm bush dominated by *Calopogoum caeruleum* , *Chromolaena odorata, Anadelphia leptocoma,* and *Pennisetum purpureum.*	Degraded area used for stockpiling of scrap metals (Figure 5.2-5)
Plot 5	725948 / 926865 Elevation 201.4m asl	Open grassland dominated with *Pennisetum purpureum, Calopogonium caeruleum,* and *Eleusine indica.*	Open area with few trees stands and some semblance of secondary forest in a distance
Plot 6	726156 / 927149 Elevation 29m asl	A thick Farm Bush dominated by *Chromolaena odorata, Calopogonium caeruleum,* and *Elaeis guineensis*.	Charcoal mining site and farm bush dominated by grasses and some bush regrowth (Figure 5.2-8)
Makoloh village (neighbouring community)	806844 / 0920824	Open field with cultivated *Zea maize* vegetation and wild vegetation is dominated by *Imperata cylindrica.* Savana Grass Land is dominated by Pennisetum purpureum, Calopogonium *caeruleum* and *Gmelina arborea* trees at the back of the site.	Open areas, farmland, and farmbush. Reasonable vegetation at some distance, but in immediate surroundings, the vegetation is young farmbush dominated by *Chromolaena odorata*

Figure 5.2-5: Degraded area for construction and metal scrap disposal

Figure 5.2-6: Remaining patch of secondary forest regrowth

Figure 5.2-7: Degraded project site

Figure 5.2-8: Coal mining ongoing within the project area

Figure 5.2-9: Farm bush cleared for construction of the project site

Figure 5.2-10: Identification of medicinal plants cleared from the project site

Flora

The assessment's thematic focus was mainly on the general vegetation, particular habitats, and ecosystems that could be impacted by habitat destruction brought on by the development and operation of the steel manufacturing industry. One of the most significant aspects of the landscape in the project area is the vegetation, particularly the forest remnants and savannah. The basic floristic makeup of the project area was established, and a species list generated as shown in Table 5.2-7.

Table 5.2-7: Plant species recorded in the project environment

Species Name	Family	Growth Type	Species Name	Family	Growth Type
Tectona grantis	Lamiaceae	Tree	*Chasmopodium caudatum*	Poaceae	Grass
Gmelina arborea	Lamiaceae	Tree	*Chasmopodium afzelii*	Poaceae	Grass
Mangifera indica	Anacardiaceae	Tree	*Rottboellia cochinchinensis*	Poaceae	Grass
Ficus exaspirata	Moraceae	Shrub	*Heterocentron subtriplinervium*	Melastomataceae	Herb
Lophira alata	Ochnaceae	Shrub	*Arachis hypogaea*	Papilionaceae	Herb
Cassia sieberiana	Caesalpiniaceae	Tree	*Oryza sativa*	Poaceae	Grass
Acacia auriculaformis	Mimosaceae	Tree	*Zea mays*	Poaceae	Grass
Acacia mangium	Mimosaceae	Tree	*Xanthosoma sagittifolium*	Araceae	Corm
Imperata cylindrica	Gramineae	Grass	*Urena lobata*	Malvaceae	Shrub
Croton hirtus	Compositae	Herb	*Trema guineensis*	cannabaceae	Shrub
Craterispermum laurinum	Rubiaceae	Shrub	*Ipomoea triloba*	Convolvulaceae	Liana
Dichrostachys glomerata	Mimosaceae	Shrub	*Ipomoea batatas*	Convolvulaceae	Liana
Dioscorea bulbifera	Dioscoreaceae	Liana	*Tridax procumbens*	Asteraceae	Herb
Homalium africanum	Samydaceae	Shrub	*Centotheca linearifolium*	Leguminosae	Herb
Parkia biglobosa	Mimosaceae	Tree	*Cyathula prostrata*	Amaranthaceae	Herb
Bombax buonopozense	Bombacaceae	Tree	*Cucumis sativus*	Cucurbitaceae	Liana
Funtumia Africana	Apocynaceae	Tree	*Manihot esculenta*	Euphorbiaceae	Shrub
Spondias mombin	Anacardiaceae	Tree	*Bambusa vulgaris*	Poaceae	Grass
Parinari excelsa	Chrysobalanaceae	Tree	*Elaeis guineensis*	Arecaceae	Palm
Newboulda laevis	Bignoniaceae	Shrub	*Clerodendrum infortunatum*	Lamiaceae	Shrub

Species Name	Family	Growth Type
Cassia occidentalis	Caesalpiniaceae	Shrub
Anthcleista nobilis	Loganiaceae	Tree
Salacia senegalensis	Celastraceae	Liana
Psychotria reptans	Rubiaceae	Shrub
Pteridium aquilinum	Dennstaedtiaceae	Fern
Premna hispida	Verbenaceae	Shrub
Psidium guajava	Myrtaceae	Shrub
Smeathmannia laevigata	Passifloraceae	Shrub
Sida stipulata	Malvaceae	Herb
Solanum torvum	Solanaceae	Shrub
Sorindeia jugladifolia	Anacardiaceae	Shrub
Pennisetum purpureum	Poaceae	Grass
Andropogon gabonensis	Poaceae	Grass

Species Name	Family	Growth Type
Panicum maximum	Poaceae	Grass
Anthocleista procera	Loganiaceae	Shrub
Alternanthera sessilis	Amaranthaceae	Herb
Cajanus cajan	Papilionaceae	Shrub
Harungana madascariensis	Hypericaceae	Shrub
Capsicum annuum	Solanaceae	Herb
Mareya micrantha	Euphorbiaceae	Shrub
Merremia umbellata	Convolvulaceae	Liana
Terminalia ivorensis	Combretaceae	Tree
Mimosa pudica	Mimosaceae	Herb
Costus afer	Zingiberaceae	Herb
Emilia coccinea	Compositae	Herb
Bidens pilosa	Compositae	Herb

Table 5.2-8 presents the list of medicinal species recorded in the project environment. This list was generated through conducting one-on-one discussions with some members of Songo and Makoloh communities. A pile of medicinal plants removed during site clearing was noted during the assessment (Figure 5.2-10). Shrubs make up the majority of plants used for medical purposes with only a few herb species being used.

Table 5.2-8: Medicinal plant species observed in the project area

Number	Species	Family	Growth form
1	*Alchonea cordifolia*	Euphorbiaceae	Liana
2	*Allophylus africanus*	Sapindaceae	Tree
3	*Anisophyllea laurina*	Anisophylleaceae	Shrub
4	*Anthocleista nobilis*	Gentianaceae	Tree
5	*Bertiera spicata*	Rubiacaea	Shrub
6	*Bridelia micrantha*	Euphorbiaceae	Shrub
7	*Caesalpinia benthamiana*	Caesalpiniaceae	Liana
8	*Carapa procera*	Meliaceae	Tree

Number	Species	Family	Growth form
9	*Cassia sieberiana*	Caesalpiniaceae	Shrub
10	*Citrus aurantifolia*	Rutaceae	Tree
11	*Cnestis ferruginea*	Connaraceae	Liana
12	*Costus afer*	Zingiberaceae	Herb
13	*Craterispermum laurinum*	Rubiaceae	Shrub
14	*Dalbergia saxatilis*	Papilionaceae	Liana
15	*Dichrostachys glomerata*	Mimosaceae	Shrub
16	*Diospyros gabonensis*	Ebenaceae	Shrub
17	*Diospyros heudelotii*	Ebenaceae	Shrub
18	*Funtumia Africana*	Apocynaceae	Tree
19	*Hallea stipulosa*	Rubiaceae	Tree
20	*Harungana madagascariensis*	Guttiferae	Shrub
21	*Mareya micrantha*	Euphorbiaceae	Shrub
22	*Momordica sp*	Cucurbitaceae	Herb
23	*Morinda geminate*	Rubiaceae	Tree
24	*Morinda morindoides*	Rubiaceae	Liana
25	*Nauclea latifolia*	Rubiaceae	Liana
26	*Palisota hirsute*	Commelinaceae	Herb
27	*Phyllanthus discoideus*	Euphorbiaceae	Shrub
28	*Rauvolfia vomitoria*	Apocynaceae	Shrub
29	*Samanea dinklagei*	Mimosaceae	Tree
30	*Sorindeia juglandifolia*	Anacardiaceae	Liana
31	*Sterculia tragacantha*	Sterculiaceae	Tree
32	*Tetracera alnifolia*	Dilleniaceae	Liana
33	*Triumfetta tomentossa*	Papilionaceae	Herb
34	*Uvaria chamae*	Annonaceae	Liana
35	*Vismia guineensis*	Guttiferae	Shrub
36	*Xylopia aethiopica*	Annonaceae	Tree

Fauna

A region's fauna provides information about its environmental circumstances and its inhabitants' well-being. As a result of their high sensitivity to ecosystem change, faunal elements like mammals, birds,

arthropods, butterflies, and fish, are best utilized as indicators of how well an ecosystem is functioning.

In the study area, birds most commonly encountered are the pied crow, pheasant, green bee-eater, red-vented bulbul, house crow, and house sparrow. Mammals found are ground squirrels, tree squirrels, and rodents. The most prevalent rodent is the Marsh Cane Rat *Thryonomys swinderianus*, which is caught by locals mostly for meat and is located near farms and bushy areas. Bush rats, mice, and both ground and tree squirrels are fairly widespread. Due to their low numbers and low encounter rates, the remaining small mammals on the list are less common and less well-known by the majority of the locals. They may be less adaptable to shifting ecological conditions brought on by widespread farming-related deforestation.

The following tables highlight the various species noted in the project area, through visual encounters, sighting of nests or droppings, and conversations with community residents.

Table 5.2-9: Bird Species recorded in the Survey area

FAMILY/Scientific name	English name	Status
ARDEIDAE		
Bubulcus ibis	Cattle Egret	AM[4]
Scopus umbretta	Hamerkop	R[5]
Butorrides striata	Green-Backed Heron	R
Ardea purpurea	Purple heron	AM
Ciconia episcopus	Woolly-Necked Stock	AM
SCOLOPACIDAE		
Actitis hypoleucos	Common Sandpiper	PM[6]
HELIORNITHIDAE		
Actophilornis africana	African Jacana	R
Demdrocygna viduata	White-Face Whistling Duck	AM
ACCIPRITRIDAE		
Accipiter badius	Shikra	
Aquila wajlbergi	Wahlberg's Eagle	
Milvus migrans	Yellow-billed Kite	AM
Gypohierax angolensis	Palm-nut Vulture	R
Necrosyrtes monachus	Hooded Vulture	R
Polyboroides typus	African Harrier Hawk	R

[4] Afrotropical migrants

[5] Resident

[6] Palaearctic migrants

FAMILY/Scientific name	English name	Status
Kaupifalco monogrammicus	Lizard Buzzard	R
PHASIANIDAE		
Francolinus bicalcaratus	Double-spurred Francolin	R
Amaurornis flavirostra	Black Crake	AM
RALLIDAE		
Sarothrura pulchra	White-spotted Flufftail	R
COLUMBIDAE		
Treron calvus	African Green Pigeon	R
Turtur tympanistria	Tambourine Dove	R
Turtur afer	Blue-spotted Wood Dove	R
Streptopelia semitorquata	Red-eyed Dove	R
Streptopelia vinacea	Vanaceous Dove	R
MUSOPHAGIDAE		
Corythaeola cristata	Great Blue Turaco	R
Tauraco persa	Green Turaco	R
Crinifer piscator	Western Grey Plantain-eater	R
CUCULIDAE		
Chrysococcyx cupreus	African Emerald Cuckoo	R
Chrysococcyx caprius	Dedrick Cuckoo	
Chrysococcyx klaas	Klaas's Cuckoo	
Oxylophus lavaillantii	Levaillant's Cuckoo	
Ceuthmochares aereus	Yellowbill	R
Centropus senegalensis	Senegal Coucal	R
APODIDAE		
Cypsiurus parvus	African Palm Swift	R
Apus apus	Common Swift	PM
Cinnyris coccinigastrus	Splendid Sunbird	R

Table 5.2-10: Species of mammals found in the project area

Scientific name	English name	IUCN Status
Sylvicapra grimmia	Bush duiker	LC[7]
Cephalophus niger	Black duiker	LC
Cephalophus maxwelli	Maxwell duiker	LC
Tregalaphus sciptus	Bush buck	LC
Heliosciurus rufobranchium	Red-legged sun squirrel	LC
Dedrohyrax dorsalis	Tree hyrax	LC
Thryonomys swinderianus	Marsh cane rats	LC
Rhabdomys pumilio	Striped grass mouse	LC
Lemnoscomys sp	Zebra mouse	LC
Mastomys natalensis	Bush rat	LC
Poiana Leighton	West African linsang	LC
Atherurus Africana	Brush-tailed porcupine	LC
Potamochoerus larvatus	Bushpig	LC
Crecitomys emini	Pouched rat	LC

6 SOCIO-ECONOMIC BASELINE DATA

This section provides an overview of the socio-economic conditions of the project area, starting from the national context, down to the local communities.

6.1 National Socio-Economic Context

Sierra Leone covers a total area of 71,740 km^2 and has a population of 7,092,113 according to the 2015 Housing and Population Census result. Historically, political instability and poor economic growth led to the brutal and destructive 10-year civil war, which officially ended in 2002.

According to the UNDP Report on Sierra Leone's progress in Human Development (2022), the country is in the same position as it was in 2016 on the Human Development Index (HDI), placing in 181 out of 195 countries. Its neighbours Liberia and Guinea are positioned at 179 and 182 respectively. According to this survey, Sierra Leone had a HDI value of 0.477 in 2021 which is below the Sub Saharan Africa

[7] Least Concern

average of 0.55. The report further shows that 64.8% of the population of Sierra Leone (approximately 4,887,000 people) are multi-dimensionally poor even though income poverty is 56.8%.

The 2010 HDR introduced the GII, which reflects gender-based inequalities in three dimensions – reproductive health, empowerment, and economic activity. Reproductive health is measured by maternal mortality and adolescent birth rates; empowerment is measured by the share of parliamentary seats held by women and attainment in secondary and higher education by each gender; and economic activity is measured by the labour market participation rate for women and men. The GII can be interpreted as the loss in human development due to inequality between female and male achievements in the three GII dimensions. Sierra Leone has a Gender Inequality Index (GII) of 0.644 ranking it 153 out of 162 countries (UNDP,2018). GII remains very high with only 10% of adult women having reached at least secondary level of education compared to 21.7% for their male counterparts.

In Sierra Leone, 12.4% of parliamentary seats are held by women, and 19.2% of adult women have reached at least a secondary level of education compared to 32.3% of their male counterparts. For every 100,000 live births, 1120 women die from pregnancy related causes; and the adolescent birth rate is 112.8 births per 1,000 women of ages 15-19. Female participation in the labour market is 57.1% compared to 58.7% for men. (2017 UNDP HR report). Table 6.1-1 presents some of these socio-economic indicators.

Table 6.1-1: Information on National Social Indicators

Key Social Indicators	Rate	Source
National Population	7,541,641	Statistics Sierra Leone (2021). Sierra Leone Midterm Population Census. [online] Available at https://www.statistics.sl/index.php/census.html
GDP per capita	$629.94 in 2021	Trading Economics (2022). Sierra Leone GDP per Capita. [online] Available at http://www.tradingeconomics.com/sierra-leone/gdp-per-capita
Economic growth rate	3.2% in 2021	African Development Bank Group (2017). *Sierra Leone Economic Outlook*. [online] Available at https://www.afdb.org/en/countries/west-africa/sierra-leone/sierra-leone-economic-outlook/
Human Development Index	0.477 in 2021	UNDP HDR Report (2021).
Multi-Dimensional Poverty Index (MPI)	64.8 (estimated)	Statistics Sierra Leone (2019). *Sierra Leone Multidimensional Poverty Index*. [online] Available at

Key Social Indicators	Rate	Source
		https://www.statistics.sl/images/StatisticsSL/Documents/Sierra_Leone_MPI_2019.pdf
Infant mortality rate (IMR)	80/1000 (2010-2020)	Unicef Data (2020). *Sierra Leone*. [online] Available at https://data.unicef.org/country/sle/
Life expectancy at birth	55.07 years	Trading Economics (2020) \. Sierra Leone Life Expectancy at birth.[online] Available at https://tradingeconomics.com/sierra-leone/life-expectancy-at-birth-total-years-wb-data.html
Maternal Mortality ratio	1,120/100,000 in 2017	Unicef Data (2017). *Sierra Leone*. [online] Available at https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SLE.MNCH_MMR.&startPeriod=1970&endPeriod=2022
Adult literacy race	43%	Unicef Data (2017) Sierra Leone. [online] Available at https://data.unicef.org/topic/education/overview/
Primary school net attendance rate (f/m)	84.4/79.2 % (2017)	Unicef Data (2017). *Sierra Leone*. [online] Available at https://data.unicef.org/resources/data_explorer/unicef_f/?ag=UNICEF&df=GLOBAL_DATAFLOW&ver=1.0&dq=SLE.ED_ANAR_L1.&startPeriod=1970&endPeriod=2022
Secondary School gross enrolment rate (f/m)	40/46.9	United Nations Statistics Division (2017). *Sierra Leone*. [online] Available at http://data.un.org/CountryProfile.aspx?crName=sierra%20leone

Sierra Leone's economy has been affected by the COVID–19 pandemic. The Gross Domestic Product (GDP) was estimated to decline by 2.7% in 2020 after growing by 5.4% in 2019. The decline was attributed to weak external demand for major exports, particularly diamonds, decline in the mining,

transport, trade, and tourism sectors. Inflation was estimated to have risen to 17% in 2020 from 14.8% in 2019, because of supply chain disruptions and transportation restrictions (AfDB, 2021).

Poverty in Sierra Leone has been a serious and alarming issue for a very long time. According to the National Development Medium – Term Plan (2019-2023), the country has an overall poverty rate of 57%, with approximately 10.8% of the population living in extreme poverty. Poverty is higher in the rural areas of the country with a poverty incidence of 72.4% and lowest in the capital with a poverty incidence of 18.5%, indicating that poverty in the country is more of a rural issue. The regional poverty trend shows that extreme poverty is predominant in the East with 18.1% of the population unable to meet their food needs. This is followed by the North with 12.1%, the South with 8.4% and the Western Area accounting for the least with 1.7%. It is estimated that on average, people in Sierra Leone can only meet 69.8% of their basic needs and 89.2% of their food needs. (GoSL, 2019). The country's Human Development Index as of 2021 is 0.477, while the multidimensional poverty index as at 2019, was 0.375.

6.2 Port Loko District Socio-Economic Context

Port Loko district is located in the Northwest of Sierra Leone and is the fourth most populous district in the country. It is bordered by the Western area to the west, Kambia district to the north, Bombali district to the East and Tonkolili district to the South. It has eleven chiefdoms including Bureh Kasseh Makonteh (BKM), Buya Romende, Dibia, Kaffu Bullom, Koya, Lokomasama, Maforki, Marampa, Masimera, Sanda Magbolontor, and Tinkatupa Makonteh Safroko (TMS). The district's largest town is Lunsar and the other major towns include Masiaka, Rokupr, Lungi, Gbinti and Port loko town. The total population in Port Loko district is 615,376. The population is predominantly Muslim (80%) and the largest ethnic group is Temne.

The main sources of livelihoods of the population are agriculture and mining and the main crops grown in the district include rice, oil palm, cassava and sweet potato.

The following tables provide some socio-economic information on the district:

Table 6.2-1: Population of Port Loko District

No.	Chiefdom	Male	Female	Total
1	BKM	19,179	21,000	40,179
2	Buya Romende	16,083	18,198	34,281
3	Dibia	7,252	8,267	15,519
4	Kaffu Bullom	59,160	61,330	120,490
5	Koya	41,119	45,058	85,177
6	Lokomasama	37,331	40,945	78,276
7	Maforki	41,416	45,348	86,764
8	Marampa	28,737	30,586	59,323
9	Masimera	19,324	21,519	40,843
10	Sanda Magbolontor	11,161	12,570	23,731
11	TMS	15,192	15,601	30,793

No.	Chiefdom	Male	Female	Total
District Total Population		294,954	320,422	615,376

Source: Statistics Sierra Leone, 2016

6.3 Socio Economic Context of Project Area

Socio-Economically, the project lies in the Northernmost end of the Western Area Rural District close to Koya Chiefdom in Port Loko District. The closest communities identified within the project's immediate environment in which the socio-economic assessment was carried out include.

- Songo Town;
- Mokoloh; and
- Kontha Line.

Songo is the largets of the three (3) communities located in the project's immediate environs, and is also the most populated. It lies partly in Koya Chiefdom, Port loko District and partly in the Western Rural District. It has over 500 houses with an estimated population of about 2500 people. Konta Line community lies entirely in the Western Rural District. It has over 300 houses with an estimated population of about 1300 people. The third immediate community around the project area is the Makoloh community which lies entirely in Koya Chiefdom, Port Loko Disrict. It has about 250 houses with an estimated population of 900 people.

These project site communities are all relatively disadvantaged as they lack access to safe drinking water, electricity, proper toilet facilities, health facilities and even face intermittent food shortage.

The employment rate among residents of these communities is very low. The majority of residents are engaged in either farming or petty trading, with a few employed by the very few entities operating within the communities. Odhav, Elvion Timber, Toll Gate, Luvian Water Company and Sierra Leone Road Safety Authority are among the entities that offer job opportunities to the community people.

According to Odhav's Community Liaison Officer, the company works in collaboration with the community, via a local committee, when it comes to employing people with skills set that the community can provide, and employment is distributed in quota among host communities.

At the time of the team's assessment, Odhav had employed about 47 unskilled community workers among which just two are women. This makes up 5% of the population of women, depicting a grave marginalization. According to the statistics of the total workers on site, there are just five (5) female workers out of the 100 workers at the site and none of them are at Managerial level.

In carrying out this assessment, stakeholders' engagement and some focus group discussions with youth groups, market women and women in agriculture were held in each of these communities to get their feedback on the project.

6.4 Socio-Economic Consultations with Project Area Communities

Social consultations and Focus Group Discussion Meetings were held with select community representatives (community leaders, farmers, men, women, and youth) from the three communities within the project area.

The success of the project ultimately depends on the manner and degree of the community stakeholders involvement in the planning and implementation process. Sufficient time and a genuinely collaborative approach were essential requirements of the participation process because the success of project depends in part upon the responsiveness of the affected communities. Consultation and community participation were achieved through stakeholders, and it facilitated interaction and engagement with the affected communities.

Stakeholder engagement was undertaken for the following reasons:

- To ensure that stakeholders are well informed about the proposed project, and to ensure that they are given sufficient opportunity to voice their opinions and concerns, and that these concerns influence project decisions.
- Stakeholder consultations helped with the scoping of issues, the assessment of impacts and their management.
- Stakeholder consultations also play an important role in providing local knowledge and information to all the community people.
- Open dialogue and engagement with stakeholders help to establish and maintain a productive relationship between Odhav and community stakeholders. This will have an overall benefit of strengthening the future relationship between Odhav and the project community stakeholders.
- Stakeholder consultations serve as a mechanism for understanding and managing expectations, by disseminating accurate information in an easily understandable manner.

6.4.1 Focus Group Discussion Outcomes – Makoloh

The following tables present the summary of focus group discussions held with representatives of Makoloh, and a question and answer session at the end.

Table 6.4-1 Summary of Findings from the Stakeholder Consultation and Focus Group Discussions in Makoloh Community

Issues	Responses
Knowledge, Perception and Challenges	The people in this community know about the existence of the company in their community. The Paramount Chief through the government brought the project to the community according to the respondents from Focus Group Discussions and Stakeholder Consultations. However, the majority did not know what the company is about and what it will be producing once it begins operations. The people in this community have mixed feelings about this project. They welcome and support the project in their community. However, there were complains about the company not fulfilling some of the promises it made to the community. They said the company promised to recruit and send some of them to Guinea for training but that is yet to happen. They also said the company promised to consult them whenever they want to undertake recruitment, but they have not been doing that. They complained that one of their main water sources, Bondo Water stream, is being polluted by spoils from land clearing that is dumped into it. They said that the company claimed ownership of the piece of land around the stream, but a land authority confirmed that the piece of land is not within the company's concession.

Issues	Responses
Land Acquisition	The Land originally belongs to the three communities – Songo, Makoloh and Kontha Line, with the Songo community having the largest share. The people of the community are knowledgeable about the acquisition of the land. The Paramount Chief asked the company to compensate the Landowners. However, they believe that the compensation was not transparent and was not fairly done by the company and authorities involved in the process. They claimed that the landowners were not given any negotiation power. Therefore, the people are not happy about the way the land was acquired. The community has experience with land acquisition because they have given land before to similar projects like the Toll Gate project.
Livelihoods	The main livelihood activities within the project area are Farming, Petty Trading and "Okada" Riding. Farming is predominant among the inhabitants of the project area with almost everyone involved in farming directly or indirectly. Petty Trading is mostly common among women in this community. As in most rural communities, Okada Riding is major source of income for youths in the community. The community's major needs are electricity, Market, health center and a police post. The range of monthly income generated from livelihood activities, among residents, ranges from 250 – 1000 New Leones. The livelihoods of the people are affected in several ways including but not limited to: - influx of traders into the area as a result of the project is affecting their sales. - Crop theft and other criminal activities have increased with the influx of people in search of jobs. - Sacked workers are roaming the communities, and some are pose a threat to the community - The people claim that a lot of them were farming on the piece of land that the company is now working on, but they didn't get any form of compensation for their crops and the deprivation from the land. - They said the company undertook road construction and, in the process, destroyed several crops along the ABB line, but they didn't pay any compensation for the destroyed crops.
Agricultural Constraints	With Agriculture being the main livelihood activity within the project area, farmers are constrained significantly in carrying out their livelihood activities. Constraints include • The use of crude tools/equipment • Fertilizer unavailability, • Pests • Low yields • Lack of finance • Lack of training, etc.

Issues	Responses
	As a way of minimizing these challenges, the community would welcome assistance with loan, fertilizers and improved seed varieties.
Employment	Employment seemed to be the major problem between this community and the company. The people in this community claim that the company has not employed even a member within their community. Instead, the company would rather employ people from outside the project area. Other Employment concerns include: - Poor salary - Frequent sackings - Lack of medical insurance - The non-payment of benefits
Traditional, Religious and Cultural Practices	The community is predominantly Muslim community with 3 mosques, 1 church and 4 missions. Traditional activities or ceremonies practiced in the community include Bondo society for women and Poro Society for men. These activities will not be affected by project activities. The graveyard is the only other sacred site within the community and it will not be affected by project activities.
Health	The community has no health center. People from this community have to go to Songo community which is approximately 2km away to seek medical attention. The common diseases within the community include: Common Cold, Malaria, Blood Pressure, Typhoid, Diarrhoea, Gonorrhoea with few reports of HIV/AIDs (which are in hidden records).
Education	The community has three Primary schools There is no secondary school within this community and those children who have reached secondary education levels must either attend schools in other communities such as Songo or end their education.
Vulnerability	Makoloh community has some vulnerable groups of people which include women, children and physically and mentally disabled persons. There are no organizations within the community to support these vulnerable groups making it very difficult for them to survive.
GBV	According to the respondents from both the FDGs and Stakeholder consultations, incidents of Gender Based Violence are very rare within the community. The community leaders have been doing a lot of work to ensure that men respect the rights of women within the community.
Water Source	The main water sources within the community are streams and hand dug wells. The community is really constrained in terms of drinking water. Project activities are polluting the Bondo Water stream, which is the main source of water for the community.
Energy	There is no electricity in the community. Their main energy source is Chinese Light Bulb. There are a Solar PV panels installed on the roof tops of a few homes.

Table 6.4-2: Summary of Questions/Concerns and Responses from Makoloh Community

Name and Designation	Question/Concern	Response
1. Pa Santigie Sesay (Section Chief)	Agreement has not been followed by company on corporate social responsibility as we were promised. The company also promised to give us funds annually for community development. When will we begin to receive these benefits?	Company rep: The company is still in the process of developing its infrastructure for operations. It has not started its operations yet.
2. Ramatu Fofanah (Chairlady)	The company promised to build some infrastructure like schools, market centers etc. They also promised to give us scholarships for our children to further their education. Why have we not seen anything at this moment?	CEMMATS rep: We will write an independent report on what you have told us. In that report there will be a community Development Action Plan which will address some of these issues which will be presented to the company and the relevant authorities.
3. Mr. Sheka Kabia (Youth Leader)	How can we improve the relationship between the company and the community?	CEMMATS rep: CEMMATS will recommend a Public Consultation and Disclosure Plan which will provide guidance for two-way communication between Odhav and the communities, on a regular basis.
4. Patient Bangura (Market Woman)	People have been coming into our community making promises to help us but we never see them again.	CEMMATS rep: We are here to assess the impact the work of Odhav will have on your community as a whole and not to make any promises.

6.4.2 Focus Group Discussion Outcomes – Songo

The following tables present the summary of focus group discussions held with representatives of Songo, and a question and answer session at the end.

Table 6.4-3: Summary of Findings on Stakeholder Consultation and Focus Group Discussion from Songo Community

Issues	Response
Knowledge, Perception and Challenges	• People have knowledge of the project. • The community stakeholders and government authorities including the former Resident Minister informed the people in the project area.

Issues	Response
	• The people said the purpose of the company is to open a steel industry within the project site. • They feel good about the project and will do everything within their powers to enhance the sustainability of the project. • Some of the challenges they foresee include waste management, theft, explosions, and chemical pollution of community ecosystem. • They would want proper monitoring systems in place by state authorities to ensure their safety
Livelihoods	• The main livelihood activities in the community are Farming, Petty Trading, firewood gathering and Okada Riding. • The major needs in this community are: ❖ Employment ❖ Electricity ❖ A vocational Institute ❖ Portable Water • The range of monthly income generated from livelihood activities is approximately NLe 200 - 500 • Petty Trading and Okada Riding will be affected positively by the project as the project area will experience an influx of people. • Agriculture will be affected negatively as more labour will drift away from agriculture. • Loss of land to the steel industry, • They believe that there is a potential for chemical pollution which may lower their yields.
Agricultural Constraints	• There have been many constraints within the agricultural sector with the most notable ones being: ❖ Financial Constraints ❖ Labour constraints as most of the youth are now involved in Okada riding ❖ Lack of fertilizer ❖ Low yields ❖ Poor road network ❖ Lack of adequate equipment/tools • The authorities or any organization can help by providing loan facilities, creating programs that can encourage youths to stay in agriculture. • We have always used waste from rice, etc as mulch and sometimes as manure. Sometimes, the waste that cannot decompose easily will be burnt in open air and the ash used as manure.
Land Acquisition	• The Community people are willing to give up land for this project as they say it will be instrumental for the development of their community.

Issues	Response
	• The land is jointly owned by the three communities – Makoloh, Songo and Kontha Line. • The respondents expected the project proponents to follow the normal procedure for buying land within the community includes: ❖ Identification of specific site ❖ Identification of the land holding family and negotiating with them ❖ Take agreement to the town chief and section chiefs ❖ Take the agreement to the local council who will issue out documents that will then be taken to the Ministry of Lands. • Respondents were pleased with the way the land was acquired by Odhav Multi Industries. The relevant stakeholders within the community including the Regent Chief at that time, were called to a special meeting and the compensation process was explained.
Employment	• The current employment situation in the community is poor as most people of working age are unemployed. Most of the youths are unemployed. The level of unemployment is even higher among women as the greater proportion are not engaged in any income generating activities at the moment. • Most respondents will be willing to take on employment opportunities with the project if such opportunity presents itself. They believe that the community has a lot of people that would be ready to take on employment opportunities with the company. • The concerns include the following: ❖ Company does not employ youth from project area ❖ Company has long work hours ❖ The sacking rate for minor offences is very high ❖ There are no benefits other than the daily wage. • There is another company, Elvion Timber Company within the community that provides employment opportunities.
Traditional, Religious and Cultural Practices and Heritage	• Islam and Christianity are the two main religions practiced within the project area. The Community has five mosques and ten churches, however, it is a predominantly Muslim community. • The common cultural practices among the inhabitants are the Poro Society for men and the Bondo Society for women. These societies are practiced at different locations within the community in different seasons. • Community graves are located within the community. • Project activities would not affect any cultural site or traditional practice as project site is far off from cultural and traditional sites.
Health	• Common diseases in the community include:

Issues	Response
	- Malaria - Cold - pain • There is a health facility within the community. However, it is understaffed and underfunded. • The health facility within the community is a Community Health Center.
Education	• The community has five primary schools and two secondary schools. • Most of the children aged (5 – 18) are enrolled in school. However, there are still a significant number of children within the school age bracket that are not enrolled. This is because their parents cannot afford the extra charges school authorities are requesting.
Vulnerability	• The community has about 20 disabled people. These include physically disabled and mentally disabled people. • There are no organizations within the communities that offer any form of help to these people.
Gender Based Violence	• There is no major evidence of Gender Based Violence in the community. • Chiefs and other authorities always ensure to educate their people about the dangers of gender based violence and other forms of violence against women and children in particular. • These efforts have helped to increase the awareness and education on GBV among community members.
Water Source	• The community has two main water sources. A hand dug well and streams. • The activities of the company will not affect any of their main water sources.
Energy	• The community does not have electricity. • The main source of energy within the project area are wood and charcoal for cooking and Chinese lamp.

Table 6.4-4: Summary of Questions/Responses from Stakeholder Consultations and Focus Group Discussions at Songo Community

Name And Designation	Question/Concern	Response
Saidu Koroma (Youth Leader)	We have been experiencing bias or selective distribution of employment opportunities among the communities. How can	CEMMATS rep: This concern has been noted down and we will include it in the report for the relevant authorities.

Name And Designation	Question/Concern	Response
	we ensure that this does not happen?	
Kadiatu J Bangura. (Youth)	Why has the company been giving employment to people from outside the project area even with jobs that we can do?	CEMMATS rep: This concern has also been noted and will be included in this report for the attention of the company and the relevant authorities.
James A Cole (Community Secretary)	We would like the company to be consulting community stakeholders whenever they want workers.	Well noted.
Aminata Conteh	The company should ensure to do their corporate social responsibility. Also, the employment of our youth in the company is very poor as there are claims that the company would rather employ people from outside the community.	CEMMATS rep. We have noted these concerns and they will be looked into by the company once this report is submitted to them.

6.4.3 Focus Group Discussion Outcomes – Kontha Line

The following tables present the summary of focus group discussions held with representatives of Kontha Line, and a question and answer session at the end.

Table 6.4-5: Summary of Responses from Stakeholder Consultations and Focus Group Discussions at Kontha Line Community

Issues	Response
Knowledge, Perception and Challenges	• Stakeholders have knowledge of the project. • The community stakeholders and government authorities including the former Resident Minister informed the people in the project area. • The community people don't know about the operations of the company • They feel good about the project coming to their community, but they are worried about the long term impact the company's activity would have on the environment. • Some of the challenges they foresee include challenge with youth employment, theft, pollution.

Issues	Response
	• They are also concerned that the company may use dangerous chemicals in their operations • They are concerned that the company may not keep to its promises of employment and other benefits to the community • They would want proper monitoring and regulatory systems in place by state authorities.
Livelihoods	• The main livelihood activities in the community are Farming, Petty Trading and Okada Riding. • The top three needs in this community are: ❖ Electricity. ❖ Health Center; and ❖ Schools and a vocational Institute • The range of monthly income generated from livelihood activities is approximately NLe 500 - 1000 • Petty Trading and Okada Riding will be affected positively by the project as the project area will experience more influx of people. • Agriculture will be affected negatively as more labour will drift away from agriculture. There will also be loss of land to the steel industry and potential for environmental pollution.
Agricultural Constraints	• There have been many constraints within the agricultural sector with the most notable ones being: ❖ Financial Constraints; ❖ Lack of fertilizer; ❖ Lack of adequate equipment/tools; ❖ Pest attack on crops. • The authorities or any organization can help by providing loan facilities, fertilizers, pesticides and creating programs that can encourage youths to stay in agriculture. • The community has always used waste from rice, etc as mulch and sometimes as manure. Sometimes, the waste that cannot decompose easily will be burnt in open air and the ash used as manure.

Issues	Response
Land Acquisition	• We are willing to give up land for this project as it will be instrumental for the development of our community. • Makoloh, Songo and Kontha Line jointly own land. • The respondents expected the project proponents to follow the normal procedures for buying land within the community include: ❖ Identification of specific site ❖ Identification of the land holding family and negotiation with them ❖ Take agreement to the town chief and section chiefs ❖ Take the agreement to the local council who will issue out documents that will then be taken to the Ministry of Lands. • The people are not pleased with the way the land was acquired by Odhav Multi Industries, because according to them, their land was taken in collaboration with few stakeholders and paid what they were willing to pay • The community have given up land for a Timber Manufacturing Company some years ago,
Employment	• The current employment situation in the community is very bad as youths are unemployed. • There is currently no indigene of Kontha Line working with the company in any capacity. • The community claims that the company is just willing to give them casual jobs that last for just a couple of weeks or months, and that these jobs are often labour intensive with low pay. • Most women are not involved in any income generating activity. • The concerns include the following: ❖ The company does not employ youths from project area ❖ There are no benefits other than the daily wage. • There are very few companies within the community that provide employment opportunities.
Traditional, Religious and Cultural Practices and Heritage	• Islam and Christianity are the two main religions practiced within the project area. Kontha Line has two mosques and a church and is a predominantly muslim community. • The common cultural practices among the inhabitants are the Poro Society for men and the Bondo Society for women. • Community graves are located within the community. • Project activities do not affect any cultural site or traditional practice as project site is far off from cultural and traditional sites.
Health	• There is NO health facility within the community. • The community people go to Songo to seek Medical attention.

Issues	Response
Education	• The community has a primary school but no secondary school. • Most children of secondary school age are not enrolled; this is because the community does not have a secondary school and the children have to cover long distances to access schools in other towns. • There are also a significant number of children within the school age bracket that are not enrolled, because their parents cannot afford the extra charges school authorities are requesting.
Vulnerability	• The community has about 10 disabled people. These include physically disabled and mentally disabled people. • There are no organizations within the community that offer any form of help to these people.
Gender Based Violence	• There is no evidence of Gender Based Violence in the community. • Chiefs and other authorities always ensure to educate their people about the dangers of community-based violence and other forms of violence against women and children in particular.
Water Source	• The community's main water source is a stream. The one hand dug well they have is currently not working. • The activities of the company affect their source of water because it is not flowing freely as it used to before.
Energy	• The main source of energy within this community are wood and charcoal for cooking and Chinese lamp. There is no electricity in any parts of the town.

Table 6.4-6: Summary of Questions/Concerns from Stakeholder Consultation from Kontha Line

Name And Designation	Question/Concern	Response
Abubakarr F Koroma (Youth)	• We do not know about the process of land acquisition. • No youth in our community has been employed in the company since they started working. • Prior to the visit of CEMMATS, we had no knowledge about the operations of the company.	**CEMMATS rep:** These concerns have been noted. **Chief Pa Roke:** Stakeholders were called to a meeting informing them about the operations of the company. We disseminated the message to other members of the community.
Pa Santigie Kalokoh (Town Chief)	• We would like to know if the company can help our community to get drinking water.	**CEMMATS rep:** This report will include a community development action plan. We will make this recommendation.

Name And Designation	Question/Concern	Response
	• There has been an increase in theft in our community at night because the community is too dark. Can the company help us with solar lights?	**Chief Pa Roke Bomboli** With more development, there will be improvements in the infrastructure within the project areas.
Abdul Hamid Bangura (Chief Imam)	• The company once told us that some members working with them will be taken to Guinea for further training. How will the selection be done?	**Chief Pa Roke Bomboli** Priority will be given to employees within the project area when this time comes.

6.4.4 Summary of Focus Group Discussion Outcomes

Focus Group discussions were held in three communities within the project area including Songo town, Mokoloh and Kontha Line in order to get an understanding of their socio-economic status and perceptions of the proposed project.

These Focus Group Discussion meetings were held with sample community stakeholders including, community leaders, farmers, women, youth etc in the three communities. The meetings were held in order to get a snapshot understanding of the communities' socio-economic status and perceptions of the proposed project. Participants in the communities were aware of the project and welcomed the project to their communities.

Participants were given the opportunity to raise questions/concerns they had about the project. Concerns were mostly focused on land acquisition issues and the lack of employment opportunities for the community people. The land belongs to three communities including Songo, Makoloh and Kontha Line. Makoloh and Kontha Line communities raised issues with the land acquisition process especially compensation issues.

The CEMMATS team along with the Company rep addressed questions/concerns as best as possible. However, participants were assured that community consultations would continue throughout project implementation, providing further opportunities for them to be updated on project details as they become available.

7 IDENTIFICATION OF POTENTIAL IMPACTS

7.1 Introduction

This chapter identifies and describes the potential environmental and social impacts of the project components on the biophysical and socioeconomic conditions of the environment and communities. Where applicable, it also identifies mitigation measures that will reduce adverse impact and that will enhance positive ones. The assessments carried out in this chapter are on potential impacts on overall environmental and social receptors caused by the project activities in construction, operation and decommissioning phases with mitigation measures recommended accordingly.

7.2 Environmental and Social Impact Assessment

7.2.1 Background

An ESIA (informed by a combination of desk top study and on-site observations by the project team) was carried out of the potential environmental and social impacts identified at the time of the study. This was done in order to first, determine the potential for such impacts, and secondly, to identify and propose mitigation measures that would enable avoidance or reduction of severity should the potential impacts occur or to increase the benefit of potential positive impacts.

7.2.2 Methodology

As the method of assessment of project impacts is inherently subjective and sometimes difficult to quantify, the experience of the project team was relied upon to assess such impacts. This is important in the light of paucity of data on most aspects of the environment, but also for the cultural and traditional, the more indigenous, domain. The knowledge of the project area by team members was invaluable in analyzing impacts. A number of steps were followed:

- A matrix of important project-specific impact categories was prepared;
- The level of significance, achievability of mitigation steps measured against practicality and cost-effectiveness were discussed in workshop/meeting setting;
- An impact assessment scale was then developed.

Table 7.2-1: Degree of Certainty of Impact

Certainty of Impact	Description
Certain	The incidence of this impact is unavoidable and to be expected.
Very Likely	There is a high percentage of possibility for this impact to occur, and measures need to be put in place to mitigate it.
Likely	There is an even chance that the impact may occur
Unlikely	The possibility of this impact occurring is remote, however it must be considered

Table 7.2-2: Environmental and Social Significance Scale

Significance scale	Description
Very High	Major or permanent alteration of environmental or social dynamics, with severe or very severe consequences, or (in the case of benefits), beneficial or very beneficial effects.
High	Long term effect on the social or natural environment. This category should be treated with a significant degree of importance at the project decision making stage.

Significance scale	Description
Moderate	Medium to long term effects on the social or natural environment. This category should also be taken into cognizance in decision making as constituting a fairly important degree of threat. The threat is real but not substantial.
Low	These would have medium to short term ramifications on the social or natural environment; these are relatively unimportant and pose very little real threat.

Table 7.2-3: Degree of Difficulty to Mitigate

Degree of Difficulty	Description
Very Difficult	The impact can be mitigated in theory, but the extent of financial or technical involvement militates against its application or effectiveness
Difficult	The impact can be mitigated, but there is a significant degree of difficulty in implementing the proposed measure.
Achievable	The impact can be mitigated without much technicality or cost.
Easily Achievable	The impact can be easily and effectively mitigated

Table 7.2-4: Impact Assessment Matrix

Mitigation Potential	Impact Significance				Certainty of Impact
	Low	Moderate	High	Very High	
Very Difficult	Medium	Major	Extreme	Extreme	Certain
Difficult	Minor	Medium	Major	Extreme	Very likely
Achievable	Minor	Minor	Medium	Major	Likely
Easily Achievable	Minor	Minor	Minor	Medium	Unlikely

Table 7.2-5: Categories of Impact

Impact	Description
Extreme	Very significant action would be required to avoid or reduce these impacts. In certain instances, such impacts would prevent the action or option concerned from being taken or approved; and alternatives would have to be considered.
Major	These impacts are significant, meaning that if effective mitigation measures are not taken, a project may be hindered from commencing or continuing. Such option would require effective management and monitoring, or abandoned altogether for other options.

Impact	Description
Medium	These impacts though important, are of less serious nature; in such a case, the Best Available Technology (or Practice) Not Entailing Excessive Cost (BATNEEC) should be employed. Such impacts alone are usually not significant enough to prevent a project from commencing or proceeding.
Minor	These impacts fall within the acceptable limits of the impact of a project on the environment, and mitigation in desirable but not necessary. This does not preclude 'Best Practice' as a means of avoiding cumulative impacts.
Positive	A beneficial impact to the bio-physical and/or socio-economic environment.

7.2.2.1 Planning and Design Stages

Collectively, these are the decision-making stages of every project. Properly planned and designed projects are sustainable and carry low impacts. No potential environmental and social impacts were identified at this stage. However, it is important to know that with proper design and planning of the components of the project, certain impacts that may occur during the other phases of the project could be minimised or even eliminated.

7.2.2.2 Construction Stage

Impacts in this stage are often temporary. The impacts anticipated at the construction stage, their recommended mitigation measures and residual impacts are shown in Table 7.2-6.

Table 7.2-6: Construction Stage Environmental and Social Impacts and Mitigation Measures

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/Enhancement measure	Mitigation Potential	Post-mitigation impact category
Air Quality	Release of dust (particulate matter) into the atmosphere from construction activities; exhaust fumes from construction machinery and vehicles contribute to respiratory health problems , poor visibility, etc. to residents, road users and workers.	Certain	Moderate	Medium	Dust suppression measures, regular maintenance of vehicles and machines; avoiding vehicle idling; following best practice; Wetting of dust prone areas at regular intervals especially during the dry season	Achievable	Minor
Noise and Vibration	High noise levels in neighbouring communities from machines and vehicles and related activities may be a source of nuisance and possibly health hazard to road users, residents and construction workers.	Certain	Moderate	Major	-Noise suppression using mufflers on vehicles and machines; -Limiting construction activities or machine intensive operations to daytime hours as best as possible. -Regular maintenance of machinery.	Achievable	Medium
Hydrology	• Construction waste water released into the environment may result in soil and water pollution, affecting flora, fauna and human users. • Surface runoff may carry away waste and other construction materials	Very likely	High	Medium	-waste water should be treated prior to discharge. -peak discharge rates can be reduced through the use of vegetated swales and/or retention ponds.	Achievable	Minor

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/Enhancement measure	Mitigation Potential	Post-mitigation impact category
	from site, to surrounding surface or groundwater bodies • The combination of heavy rainfall, drainage density and clayey soil in the area makes it prone to water induced erosion. • The movement of construction vehicles and machinery can result in change in flow patterns. • Human and machinery activities may disturb soil structure through compaction and movement of soil. This disturbance in turn can result in hydrological changes.				-grease traps should be installed at the workshop areas and refuelling areas. - fuels and waste oils will be properly contained and stored stored in bunded areas. - Regular maintenance of vehicles and machinery to avoid leaks and spillage of hazardous materials. -a land reclamation plan will be implemented after the construction phase		
Waste Management	Improper management of construction and other wastes from day to day activities could pose environmental, health and safety hazards to workers and community residents.	Certain	High	Major	- A waste management plan will be developed and implemented. - Adequate waste bins will be provided for waste collection and segregation. - Licensed waste management contractors	Achievable	Minor

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/Enhancement measure	Mitigation Potential	Post-mitigation impact category
					will be employed to handle waste. - Contractor activities will be periodically monitored to ensure compliance with Waste management plan.		
Soils	Topsoil erosion from excavation and construction activities	Likely	Moderate	Medium	Implementation of erosion control and soil stability mechanisms and structures.	Achievable	Minor
Water Quality	Pollutants (construction materials and wastes) may find their way into nearby streams if not properly controlled on land.	Likely	High	Major	-Construction Materials and wastes will be safely stored and protected from agents of dispersal such as water and wind. - traps should be installed at the workshop areas and refuelling areas. - fuels and waste oils will be properly contained and stored stored in bunded areas. - Regular maintenance of vehicles and machinery to avoid leaks and spillage of hazardous materials.	Achievable	Medium

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/Enhancement measure	Mitigation Potential	Post-mitigation impact category
					-Any spills or leaks on site will be immediately cleaned up.		
Fauna	The removal of vegetation during land clearing will cause some animals to migrate. Soil excavation may cause soil erosion and result in siltation and sedimentation which will impact water quality subsequently affecting Aquatic life.	Likely	Moderate	Medium	• Monitor presence of wildlife species during construction activities.	Difficult	Minor
Flora	There will be loss of vegetation in the project site during construction and this loss will be permanent in a large portion of the site that hosts the factories, ancillary buildings and workshops.	Certain	High	Medium	• Vegetation clearing will be limited to the minimum required for wwork. • Vegetation cleared for access roads will be restored where possible once these access routes are no longer needed. • Work activities will be planned in such a way to minimize presence and duration in ecologically sensitive areas. • Minimize the felling of trees during vegetation clearing	Difficult	Medium

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/Enhancement measure	Mitigation Potential	Post-mitigation impact category
					to only unavoidably necessary ones.		
Population Influx	There will be an influx of people from outside the project area in search of job opportunities.	Certain	Moderate	Medium	• Contractors and suppliers from the project area will be encouraged to supply materials and apply for job opportunities they are qualified for. • Contractors will be encouraged to hire and develop local labour.	Achievable	Minor
Economic Benefits	Infrastructural development Economic benefits could be realised by project area communities through job and business opportunities during this phase.	Certain	High	Positive	• Raw materials such as sand, wood, aggregates, etc will be sourced locally which will provide economic benefits for project area communities. • Contractors and suppliers from the project area will be encouraged to supply materials and apply for job opportunities they are qualified for.	Achievable	Positive

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/Enhancement measure	Mitigation Potential	Post-mitigation impact category
					• Contractors will be encouraged to hire and develop local labour.		
STDs, HIV/AIDS and Teenage Pregnancy Issues	The risk of the prevalence of STDs, HIV/AIDS and teenage pregnancy in nearby communities is increased with the interaction of construction workers with community youth.	Likely	High	Major	• Sensitization and awareness raising will be provided among workers and communities. • All Project prsonnel will be provided with appropriate induction training communicating health hazards, including HIV/AIDS, STDs and malaria along with the prevention and mitigation measures required. • Inappropriate behaviour by Project personnel will be carefully managed through relevant human resources processes, to minimise the potential spread of illnesses and infective deases.	Achievable	Medium
Occupational health and Safety	• Injuries at construction work-sites, falling objects, as well as from the use of equipment and tools, cuts from stepping on sharp objects such as nails	Likely	High	Medium	• An appropriate OHS management system will be implemented. • Workers will be provided with all the required PPE.	Achievable	Minor

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/Enhancement measure	Mitigation Potential	Post-mitigation impact category
	and other metal off-cuts are likely to occur.				• Toolbox talks will be carried out daily on safe work practices and other OHS issues. • Only trained and qualified technicians will be involved in the electrical installations. Regular training will be conducted for workers to ensure they are aware of the safe work practices required when working with or in the vicinity of transmission line equipment.		
Job opportunities	Construction activities may create (temporary) job opportunities for local population, especially youth.	Likely	High	Positive	Contractor must be instructed to give priority to the employment of local population.	Achievable	Positive
Gender Based Violence	The potential for gender-based violence to increase during this phase is likely, with the interaction of construction workers with community women/girls. The violence may arise from issues related to jealousy, affairs, misunderstandings, etc.	Likely	High	Medium		Difficult	Medium

7.2.2.3 Operational Stage

Once best practices have been observed at the planning/design and construction stages, much of the threat to the safety and integrity of the environment and society will be reduced to levels defined by legislation and best practices. The operational phase of the project will therefore become safe, with what little risk there is associated with general running of machinery, which can be easily addressed through manufacturer's specified maintenance and repair standards and adherence to the ESMP. All identified impacts with their mitigations are described in Table 7.2-7.

Table 7.2-7: Operational Stage Environmental and Social Impacts and Mitigation Measures

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/ Enhancement measure	Mitigation Potential	Post-mitigation impact Category
Air Quality	Particulate matter containing varying concentrations of mineral oxides, metals, metal oxides may be generated in the processes. Processes that produce particulate matter include melting, refining activities, heating furnaces, mechanical actions and handling of materials. PM emissions could also come from coal storage, conveying, charging, coking, pushing and quenching. Coke oven plants are also a significant source of dust.	certain	moderate	Minor	Regular maintenance of vehicles and machinery; avoiding vehicle idling; following best practice. Air Quality Mitigation measures specific to Steel mills include: **Coke oven plant** • Installation of collection hoods for coke oven batteries • Maintenance and cleaning of emissions sources. • Reduction of the coke charge in the blast furnace • Use of smokeless charging measures • Use of coke dry-quenching system **Blast furnace** • Introduction of dedusting systems including scrubbers and electrostatic precipitators • Use of primary controls for the flue gas of the BOF, including venturi scrubbers.	Achievable	Minor

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/ Enhancement measure	Mitigation Potential	Post-mitigation impact Category
					• Installation of secondary controls to capture off-gas escaping from the BOF process. • Encapsulation of metal pouring lines with fitted extractors. **Raw Material Handling** • Use indoor or covered stockpiles • Use enclosed silos to store bulk powder where possible • Implementation of routine plant cleaning and maintenance • Implementation of correct loading and unloading practices • Install dust controls at conveyor transfer points **Coal Dust emissions** • Minimize the height of coal drop to the stockpile • Use water spray systems and polymer coatings to reduce the formation of dust from coal storage.		

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/ Enhancement measure	Mitigation Potential	Post-mitigation impact Category
					• Use particulate control equipment to capture dust emissions from crushing and sizing activities. • Use of enclosed conveyors with extraction and filtration equipment to prevent dust emission at conveyor transfer points.		
Noise and Vibration	Noise from vehicles and machines during plant operations may be a source of nuisance and possibly health hazard to workers and residents. Noise sources specific to steel manufacturing industry include scrap and product handling, gas fans, rotating equipment, dedusting systems, furnace charging, EAF melting processes, cutting activities, transport and ventilation systems,etc.	Certain	moderate	Medium	Noise suppression measures including: • Screening of noisy equipment including fans and insulation of ventilation pipes to contain the noise generated. • Trying as best as possible to limit handling and transportation of scrap to night time. • Enclosure of scrap and slab storage and handling areas. • using of ear -muffs by operators.	Achievable	Minor

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/ Enhancement measure	Mitigation Potential	Post-mitigation impact Category
Waste Management	Solid waste and by-products will be generated during plant operations. This waste includes slag, dust and sludge from the blast furnace, metallic waste from rolling and finishing operations, tar and other organic compounds, etc. Wastewater is also generated from varying sources including cooling water, stormwater and rinse water. Cooling water is recycled however, rinse water may contain suspended solids, dust, lubricating oil and other pollutants depending on the process.	certain	High	Major	Most of the waste/wastewater generated in the Steel industry is recycled to obtain added value from various types of by-products. When recycling is not financially or technically feasible, waste should be disposed of in a landfill designed for the specific type of waste. Furthermore, the following steps can be taken in managing the waste/wastewater generated: • Storage of waste including coke and coal in a bunded area. • Process areas should be paved and the stormwater from these areas routed to a wastewater treatment unit. • Segregate contaminated and non-contaminated stormwater and have a spill control plan in place. • Ensure that coal stockpile areas are paved to prevent potentially contaminated stormwater from leaching into and contaminating groundwater.	Achievable	Medium

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/ Enhancement measure	Mitigation Potential	Post-mitigation impact Category
Occupational Health and Safety	Plant workers will be subjected to related OHS issues such as physical hazards, heat and hot liquids, radiation, respiratory hazards, chemical hazards, electrical hazards, noise, entrapment hazards, fire and explosions, risk of injury/death, etc.	certain	High	Major	- They will be provided with PPE required for the nature of the work. - An OHS orientation training will be provided for all new employees as well as periodic OHS training for all employees. - Toolbox safety talks will be conducted daily. - First aid and medical facilities will be made available. - Clear signage will be placed in all transport corridors and working areas. - All vessels containing hazardous substances will be clearly labelled. - Specific load handling and lifting procedures will be implemented. - Safety buffer zones separating hot materials handling areas will be implemented including rail guards and locked gates.	Achievable	Minor

Environmental/ Social Issue	Impact Description	Certainty of impact	Significance	Pre-mitigation Impact Category	Mitigation/ Enhancement measure	Mitigation Potential	Post-mitigation impact Category
					- Extreme temperatures will be controlled through the installation of cooling ventilation. - Regular work/water breaks will be provided to workers with access to a cool rest area and drinking water. - General Environmental Health and Safety practices will be adopted.		
Employment opportunities	Increase in employment opportunities as a result of plant operations	certain	Moderate	Beneficial		Achievable	Beneficial
Unrealistic Expectations	Communities harbour unrealistic expectations in relation to the project which may develop into grievances and community disturbances.	Likely	High	Medium	- Regular meetings and communication with communities to keep them accurately informed and limit the potential for unrealistic expectations to develop. - Implementation of community development activities.	Achievable	Minor

8 SUMMARY AND CONCLUSION

8.1 Summary

Sierra Leone's GDP relies greatly on the Agriculture, Industry and Service sectors. The Industrial sector was a major contributor to this growth in 2019. However, with the emergence of the COVID-19 pandemic, this growth was curbed and the impact was particularly felt in the industrial sector including the mining, manufacturing, trade and tourism sectors.

With the economic boost needed in Sierra Leone post COVID-19 pandemic, the establishment of manufacturing industries is being greatly encouraged by Sierra Leone's Ministry of Trade and Industry as this will not only bring infrastructural development but also create job opportunities for Sierra Leoneans. As such, Odhav's establishment of a Steel Manufacturing plant in Songo, Port Loko District is fully supported by the government of Sierra Leone. Odhav signed a $240 million investment agreement with Sierra Leone's Ministry of trade and Industry in 2021 to develop a Steel Manufacturing and Processing plant on 160 acres of land in Songo. The plant will be the first of its kind in Sierra Leone and aims to cater for a market size of 350,000,000 and create job opportunities for 1200 employees within the ECOWAS region.

Prior to commencement of an industrial project, like any other project that may affect the environment and communities, it is mandatory by legislation that an ESIA study be done and an EIA licence secured. The Sierra Leone *Environmental Protection Agency Act (2008) (SLEPAA)* and the *EIA Supplementary Act (2010),* require that companies meet the local legal requirements and demonstrate commitment to protect the environment.

8.1.1 Components of the ESIA

The principal objective of the ESIA is two-fold: the first objective is to satisfy the requirements of the local environmental regulatory body, EPA-SL for the issuance of the EIA license for the project to commence; the second objective is to adhere to best practice by meeting internationally accepted guidelines and operating procedures such as those of the World Bank's IFC. The study involved predicting the environmental impacts of the project as described, and suggesting mitigation measures where impacts are adverse and enhancement measures where impacts are positive.

The ESIA report comprised:

i. Compilation of an Environmental and Social Impact Assessment (ESIA) based on the design plans and the baseline study;

ii. Development of an Environmental Management Plan based on the proposed mitigation measures.

The investigations of impacts on the social environment is a crucial part of the study, since the operation will affect the livelihoods of the communities within the project area. The investigation of social impacts has involved the following:

i. A baseline socio-economic study of communities surrounding in and around the project area;

ii. Undertaking stakeholders' focus group discussions to sensitise stakeholders and Project Affected Persons (PAPs) on the Project.

Discussions and meetings with stakeholders during the consultation process indicated general acceptability for the project. Local authorities within the project area expressed their opinions, concerns and general willingness for full co-operation and support during the survey and these were evident during the field investigations.

8.1.2 Key Assessment Findings

Physical Environment

Aspects of the physical environment identified as potentially at risk from project activities including air quality, noise, soils, water quality etc. None of these are likely to be adversely affected and impacts to them will be temporary. Mitigation measures to minimise impacts are recommended.

Biological Environment

Loss of vegetation and related fauna are among the impacts to the biological environment identified. In some instances, loss of vegetation will be permanent; loss in areas such as access routes created during the project, are reversible. Mitigation measures have been proferred to minimize the impacts to the Biological environment.

Socio-economic Environment

During Focus Group Discussions, participants were generally aware of the project and welcomed the project. However, a few concerns were raised that especially had to do with the land acquisition process. The land belongs to three communities including Songo, Makoloh and Kontha Line. Makoloh and Kontha Line communities raised issues with the land acquisition process especially compensation issues. The lack of employment opportunities within the Company for indigenes of the three communities was another issue raised during consultations.

The project is likely to have positive impacts in the area of infrastructural development, job creation improving the quality of life of some of the locals and, on the national scale, boost economic development.

8.2 Conclusion

The baseline environmental and socio-economic situation has been presented. There are both negative and positive socio-economic impacts of the project, but on the whole the positive impacts relating to the plant's contribution to the Industrial sector, improvement in the livelihood of community people and that of the economy of the country far outweigh the negative impacts. Whilst the impacts at various stages of the project have been identified, mitigation and monitoring measures have been recommended as part of the environmental management plan.

The investigations reveal that environmental and social problems brought by the project can be adequately managed and that there are no insurmountable problems that will stop the project from receiving approval to proceed.

It must however be ensured that commitments made in the Environmental and Social Management Plans are followed through.

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APPENDICES

ANNEX A: FOCUS GROUP DISCUSSION ATTENDANCE LISTS

Environmental and Social Impact Assessment on the Construction and Operation of Odhav Multi Industries (SL) Ltd Steel Manufacturing and Processing Plant

ATTANDANCE LIST FOR STAKEHOLDER CONSULTATION SD.

Location: KONTA LINE COURT BARRAY GPS Coordinates: 8° 22'40"N 12°57'34"W Date: 8/09/2022

No	Name	Designation	Phone No./Email	Signature
1	Hassan B. Kamara	Headman	079 767279	
2	Pa Roke Bonboi	ceremonial chief	077677423/079227236	
3	Musa Koroma	Elder		
4	Abdul Karim Koroma	Youth	033317597	
5	Pa Santigie Kalokoh	Town chief		
6	Osman J. Sankoh	Youth	08076890	
7	Osman Kamara	youth		
8	Alpha B Koroma	Youth	075860733	
9	Adama Kargbo	Elder	033331618	
10	Mohamed Koroma	Elder	077600025	

Environmental and Social Impact Assessment on the Construction and Operation of Odhav Multi Industries (SL) Ltd Steel Manufacturing and Processing Plant

ATTANDANCE LIST FOR STAKEHOLDER CONSULTATION SD.

Location: KONTA LINE COURT BARRAY GPS Coordinates: 8°22'40"N 12°57'34"W Date: 8/09-2022

No	Name	Designation	Phone No./Email	Signature
11	Spottiswood Kargbo	Secretary/youth chair(L)	076797745/07755728	
12	Aminata Koroma	Elder		
13	Osman Sesay	Elder	088485536	
14	Momoh Koroma	youth	074028962	
15	Ibrahim Bangura	youth	077438720	
16	Alie Borbor Kamara	Youth Chairman	076869476	
17	Mohloh Kamara	Elder	031595604	
18	Sheikh Abdul Hamid Bangura	Chief Imam	032305398	
19	Abass Kabia	youth	077766718	
20	Abubakarr F Koroma	Youth	077755076	

Environmental and Social Impact Assessment on the Construction and Operation of Odhav Multi Industries (SL) Ltd Steel Manufacturing and Processing Plant

Chief's House

ATTANDANCE LIST FOR STAKEHOLDER CONSULTATION SD.

Location: Makolo GPS Coordinates: 8° 23'21"N 12° 56'52"W Date: 7/09/2022

No	Name	Designation	Phone No./Email	Signature
1.	Santigi Sesay	Section Chief	078800149	
2.	Pa Osman Sesay	Headman	076 909 202	
3.	Ramatu Fofanah	Chairlady	079 718929	
4.	Amidu Bangura	Deputy Headman	031 835877	
5.	Abdul Sitta Kamara	Youth Chairman	030 15 2401	
6	Mr. Sheka Kabia	Youth Leader	099 911780	
7	Mr. John Koroma	Town Imam	033 99 3609	
8	Pa Abdulai Bangura	Stakeholder	088 91 7339	
9.	Adama Sesay		076 909202	
10	Lansana Kabbia			

Environmental and Social Impact Assessment on the Construction and Operation of Odhav Multi Industries (SL) Ltd Steel Manufacturing and Processing Plant

ATTANDANCE LIST FOR FOCUS GROUP DISCUSSIONS.

GROUP TYPE: Focus Group Discussion With Youth

Name of Community: Songo Court Barrie GPS Coordinates: 8°22' 18"N 12° 56'21"W Date and Time: 9/9/2022

No	Name	Designation	Phone No./Email	Signature
1	Wurie Sesay	Youth Chairman	076 056171	
2	Alie Kamara	Youth		
3	Alpha B. Bangura	Youth		
4	Alhassan Koroma	Youth	032 13 53 50	
5	Lansana Yongkuba	Youth		
6	Mohamed K. Kargbo	Youth		
7	Cyrica Conteh			
8	Idriss Koroma	Vice Youth Chairman	033078530	
9	Mohamed S Kamara	Youth	033 203840	
10	Simon Morgay	Youth	032-19-76-81	

Environmental and Social Impact Assessment on the Construction and Operation of Odhav Multi Industries (SL) .td Steel Manufacturing and Processing Plant

ATTANDANCE LIST FOR FOCUS GROUP DISCUSSIONS.

GROUP TYPE: Youth

Name of Community: Songo Court Barra GPS Coordinates: 8°22'18"N 12°56'21"W Date and Time: 9/9/2022

No	Name	Designation	Phone No./Email	Signature
11	Hawanatu Bangura	Youth	080-099-856	
12	Sento .D. Kargbo	youth	033.244.317	
13	Alhassan .S. Sesay	Youth	030 77 41 58	
14	Jestina Kamara	Youth	033 91 43 00	
15	Abu - Koroma.	Youth	088 949303	
16	Isatu Gbankay.	Youth	088 94 9303	
17	Amiratu Z. Kargbo	Youth	088-42-44-84	
18	Saidu Koroma	youth	079-74 1066	
19	Sulaiman P Sesay	youth	076-603038	
20	Kabila J Bangura	youth	076-320342	

Environmental and Social Impact Assessment on the Construction and Operation of Odhav Multi Industries (SL) .td Steel Manufacturing and Processing Plant

ATTANDANCE LIST FOR STAKEHOLDER CONSULTATION SD.

Location: Songo Court Barra GPS Coordinates: 8°22' 18" N 12°56'21"W Date: 7/09/2022

No	Name	Designation	Phone No./Email	Signature
1.	James A Cole	Secretary	076 84 11 71	
2.	Hassan Kamu	Deputy Imam		
3	Dan Kargbo	Head Man	080 439 680	DK
4.	Mariama Koroma	Soue Head	077 25 14 63	MSK
5	Samuel Johnson	Stakeholder		
6	Lansana Kamkoba	Stakeholder		
7.	Rosaline D Kamara	Stakeholder	076 82 83 13	
8	Fatu Bangura	Stakeholder		
9.	Winnie Sesay	Youth Leader	076056171	
10	Aminata Conteh	Stakeholder	079663313	

Environmental and Social Impact Assessment on the Construction and Operation of Odhav Multi Industries (SL) Ltd Steel Manufacturing and Processing Plant

Chief's House

ATTANDANCE LIST FOR STAKEHOLDER CONSULTATION SD.

Location: Makolo **GPS Coordinates:** 8° 23'21"N 12° 56'52"W **Date:** 7/09/2022

No	Name	Designation	Phone No./Email	Signature
1	Santigi Sesay	Section chief	078800149	
2	Pa Osman Sesay	Headman	076 909202	
3	Ramatu Fofanah	Chairlady	079 718929	
4	Amidu Bangura	Deputy Headman	031 835877	
5	Abdul Sitta Kamara	Youth Chairman	030 152401	
6	Mr. Sheka Kabia	Youth Leader	099 911780	
7	Mr. John Koromo	Town Imam	033 993609	
8	Pa Abdulai Bangura	Stakeholder	088 917339	
9	Adama Sesay		076 909202	
10	Lansana Kabbaba			

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