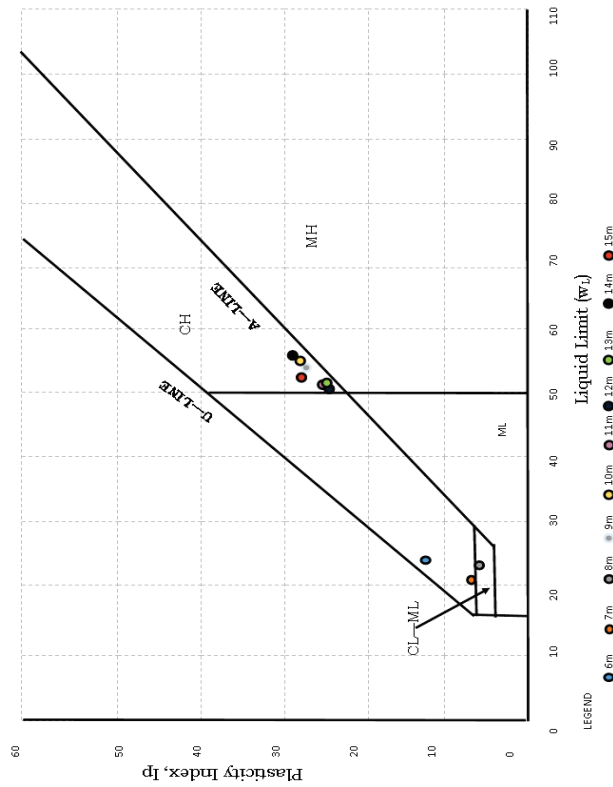




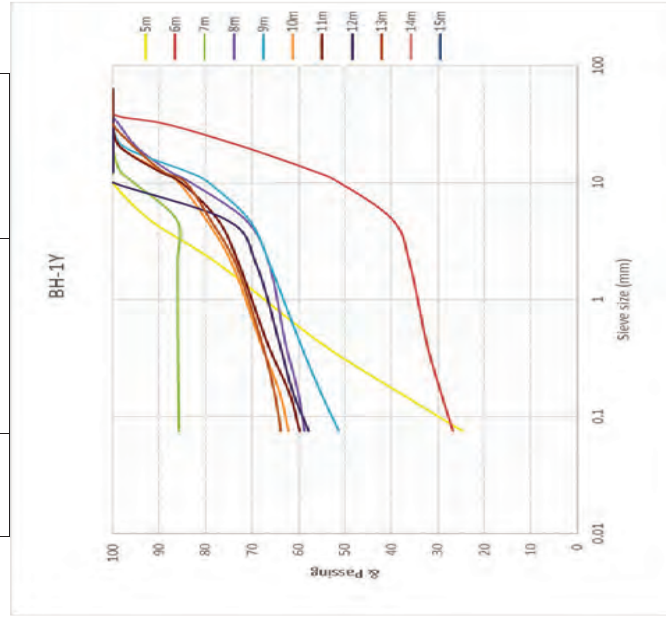
A-LINE CHART FOR BH-2Y



Appendix VII- Sieve Analysis Charts of Boreholes and TrialPits

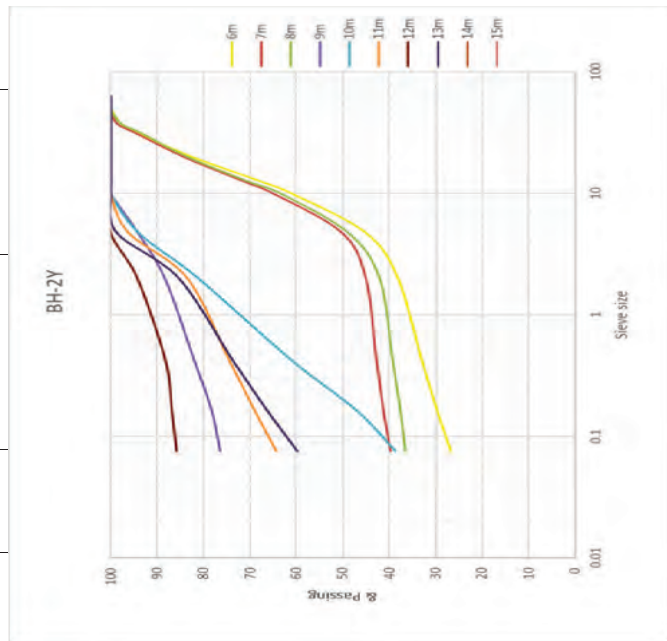
SIEVE ANALYSIS CHART FOR BOREHOLES AT SELECTED DEPTHS

PROJECT TITLE: Geotechnical Investigation for the proposed construction of EDSA Substation at York Village	GRAIN SIZE DISTRIBUTION CHART	CLIENT: JICA BOREHOLE NO: BH-1Y
FINES	SAND	GRAVEL





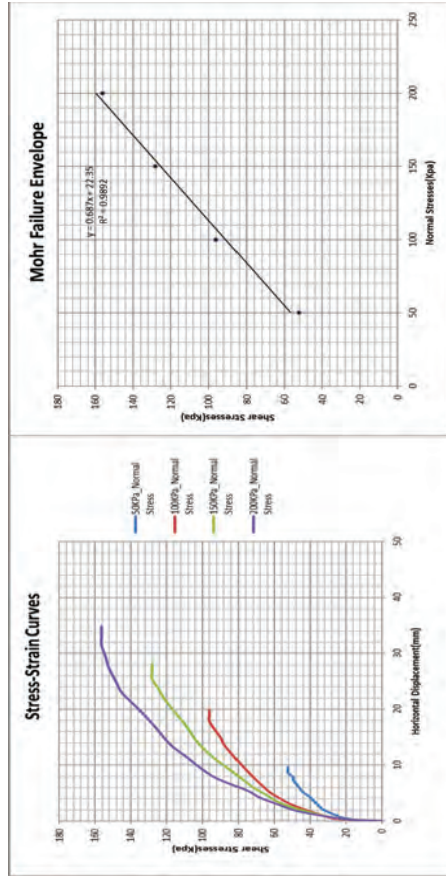
PROJECT TITLE: Geotechnical Investigation for the proposed construction of EDSA Substation at York Village	GRAIN SIZE DISTRIBUTION CHART	CLIENT: JICA
FINES	SAND	GRAVEL



Appendix VIII- Shear Parameters

SHEAR BOX TEST RESULTS FOR COLLECTED SAMPLES

SHEAR BOX RESULT FOR BH-1Y @ 5.0m

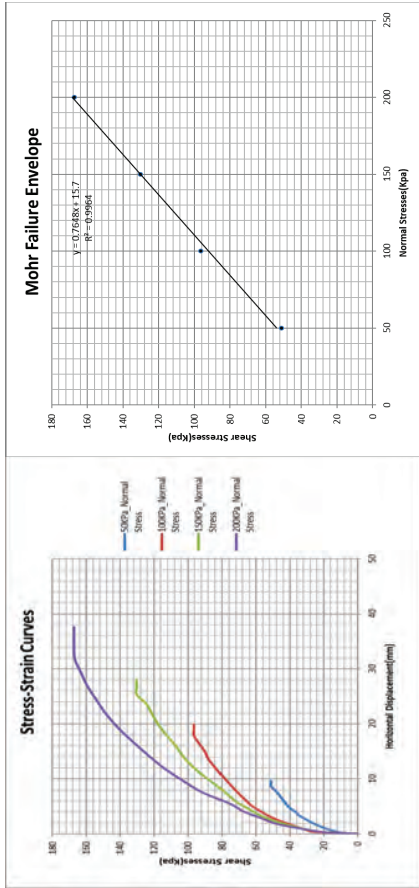


Load (kN)	Normal stress (kN/m ²)	Shear stress (kN/m ²)
0.153	50	52.4
0.306	100	96.1
0.459	150	128.2
0.612	200	156.2

Friction angle, $\phi = 34^\circ$; Cohesion, $C = 22.35 \text{ kN/m}^2$



SHEAR BOX RESULT FOR BH-1Y @ 6.0m

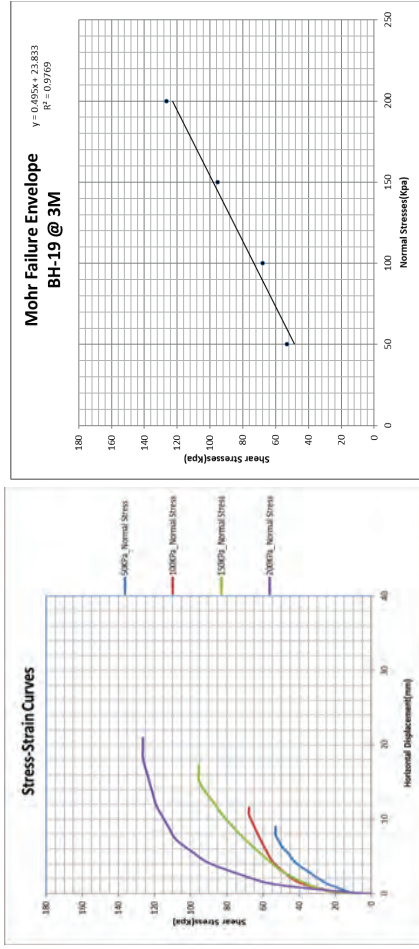


Load (kN)	Normal stress (kN/m ²)	Shear stress (kN/m ²)
0.153	50	51.2
0.306	100	96.3
0.459	150	130.4
0.612	200	167.3

Friction angle, $\phi = 37^\circ$; Cohesion, $C = 15.7 \text{ kN/m}^2$



SHEAR BOX RESULT FOR BH-1Y @ 7.0m

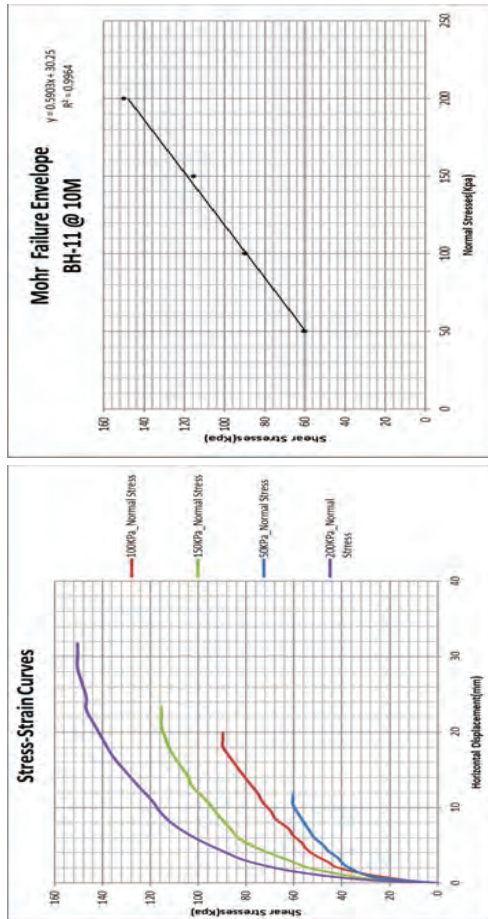


Load (kN)	Normal Stress (kN/m ²)	Shear Stress (kN/m ²)
0.153	50	53.167
0.306	100	67.833
0.459	150	95.333
0.612	200	126.5

Angle of internal friction, $\phi = 26^\circ$; Cohesion, $C = 23.833 \text{ KPa}$

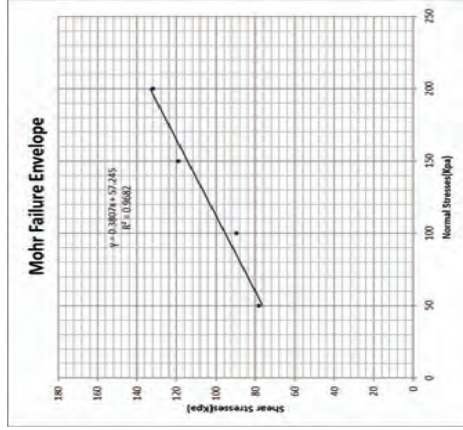
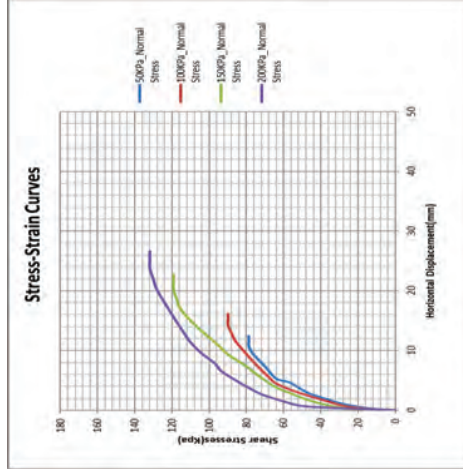


SHEAR BOX RESULT FOR BH-1Y @ 9.0m



Load (kN)	Normal Stress (kN/m ²)	Shear Stress (kN/m ²)
0.153	50	60.5
0.306	100	89.83
0.459	150	115.5
0.612	200	150.33

Angle of internal friction, $\Phi=31^\circ$; Cohesion, $C = 30.25\text{KPa}$

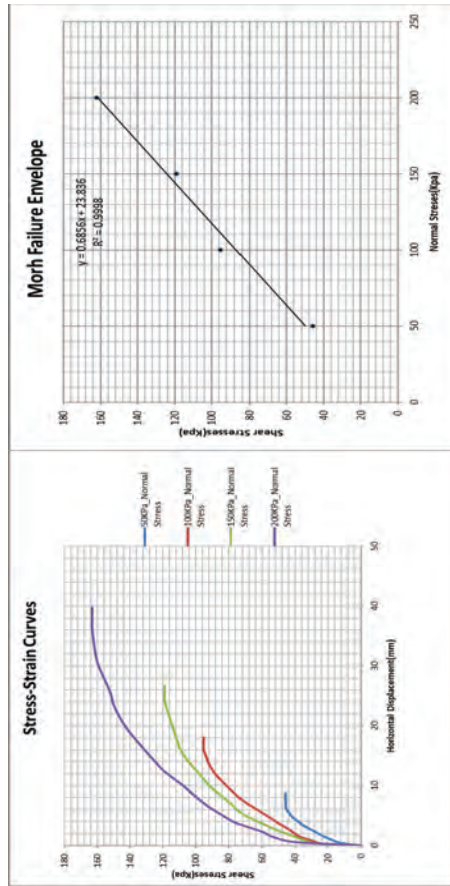


Load (kN)	Normal stress (kN/m ²)	Shear stress (kN/m ²)
0.153	50	78.33
0.306	100	89.83
0.459	150	119.17
0.612	200	132

Angle of internal friction, $\Phi=21^\circ$; Cohesion, $C = 57.245\text{KPa}$



SHEAR BOX RESULT FOR BH-2Y @ 6.0m

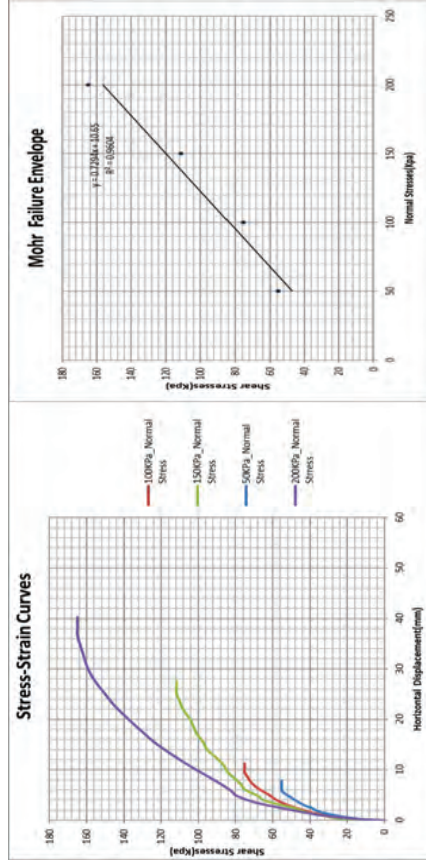


Load (kN)	Normal stress (kN/m ²)	Shear stress (kN/m ²)
0.153	50	46
0.306	100	95.333
0.459	150	119.17
0.612	200	162

Friction angle, $\Phi= 37^\circ$; Cohesion, $C= 12.67\text{kN/m}^2$



SHEAR BOX RESULT FOR BH-2Y @ 7.0m

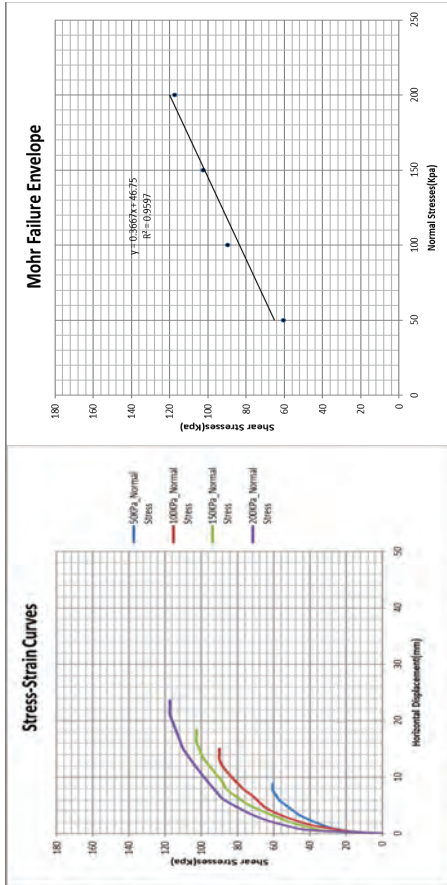


Load (kN)	Normal stress (kN/m ²)	Shear stress (kN/m ²)
0.153	50	55.3
0.306	100	75.6
0.459	150	111.5
0.612	200	164.9

Friction angle, $\Phi= 36^\circ$; Cohesion, $C= 10.65\text{kN/m}^2$



SHEAR BOX RESULT FOR BH-2Y @ 9.0m

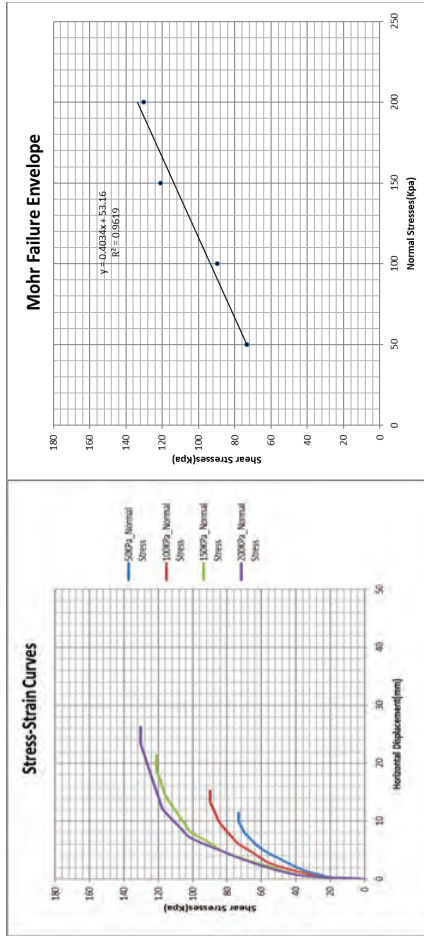


Load (kN)	Normal stress (kN/m ²)	Shear stress (kN/m ²)
0.153	50	60.5
0.306	100	89.83
0.459	150	102.67
0.612	200	117.33

Friction angle, $\Phi = 20^\circ$; Cohesion, $C = 46.75 \text{ kN/m}^2$



SHEAR BOX RESULT FOR BH-2Y @ 11.0m



Load (kN)	Normal stress (kN/m ²)	Shear stress (kN/m ²)
0.153	50	73.33
0.306	100	89.83
0.459	150	121
0.612	200	130.17

Friction angle, $\Phi = 22^\circ$; Cohesion, $C = 53.16 \text{ kN/m}^2$

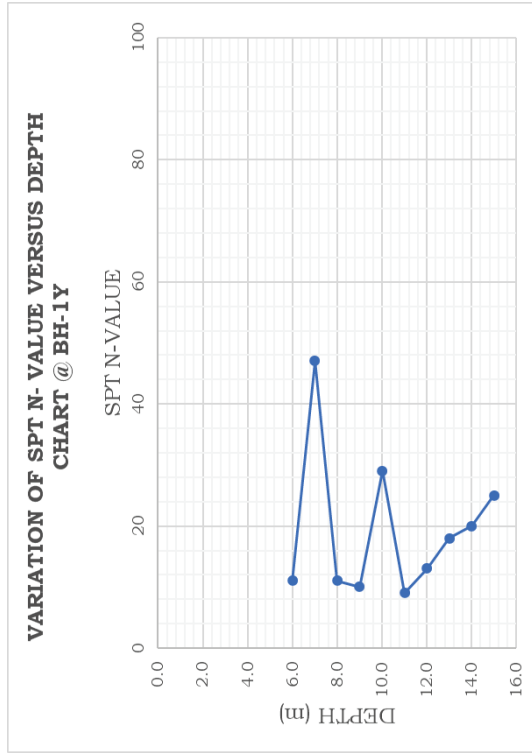


Appendix IX - SPT N-Value Charts Variation of SPT N-Values Versus Depth

VARIATION OF SPT N-VALUES VERSUS DEPTH FOR BH-1Y

UTM Coordinate: 701739.6E, 916802N

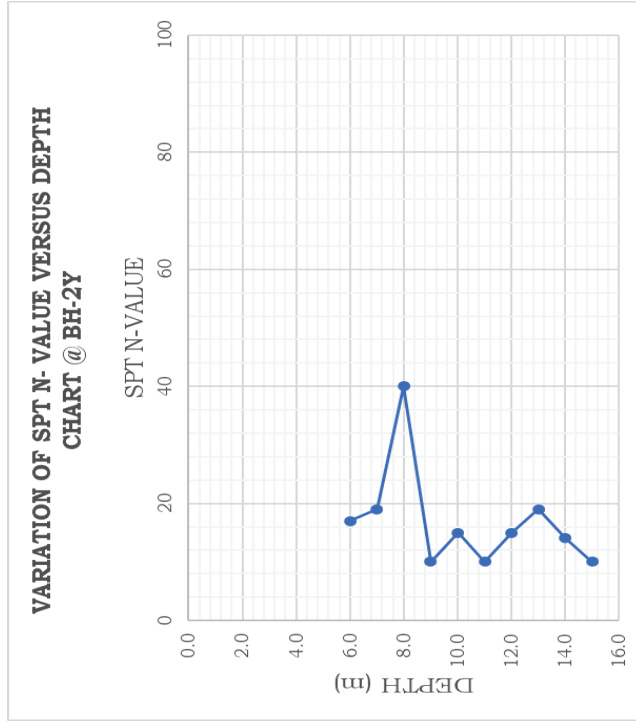
Elevation: 41.4m



VARIATION OF SPT N-VALUES VERSUS DEPTH FOR BH-2Y

UTM Coordinate: 701755.6E, 916820.7N

Elevation: 42m



Appendix X - Summary of Laboratory Test Results for Boreholes and Trial Pits
SUMMARY OF LABORATORY TEST RESULTS FOR BOREHOLES

PROJECT No.:002		CONTRACT No.:002											
PROJECT LOCATION: YORK VILLAGE		BH OR TP ID: BH-1Y											
CLIENT(s): JICA		CONTRACTOR (s):											
CONSULTANT(S): INNOVATIVE SOLUTIONS CONSULTANCY (ISC) SL													
TEST: Summary of Lab tests results													
All depths (m)	Atterberg Limits Test		USCS SOIL DESCRIPTION	SAND (%)	GRAVEL (%)	FINE (%)	Shear Box Test		Consolidation Test		Specific gravity of soil solids (Gs)		
	Natural Moisture Content (%)	LL (%)					PL (%)	FI (%)	Friction angle (φ) deg.	Cohesion (c) (kN/m ²)		Coefficient of consolidation (Cv) (cm ² /sec)	Compression Index Cc
0.03-4.5	19.3	28.6	15.0	13.6	SC	Moderately weathered Lateritic rock (Gabbroic rock)	-	-	-	-	-	-	
4.5-5.0	19.3	28.6	15.0	13.6	SC	Clayey sand	66.3	8.9	24.8	34	22.35	-	2.22

5.0-6.0	24.3	29.3	14.6	14.7	GC	Clayey gravel	12.9	60.3	26.8	37	15.7	-	-	2.19
6.0-7.0	20.7	21.8	15.2	6.6	CL-ML	Silty clay	0.4	13.8	85.8	26	26.83	0.00084	0.1062	2.31
7.0-8.0	26.9	22.7	16.9	5.8	GC-GM	Silty clayey gravel	3.6	67.7	28.7			0.00086	0.1143	2.43
8.0-9.0	32.7	32.4	15.9	16.5	CL	Gravelly lean clay	12.6	28.7	58.7	31	30.25	0.00092	0.2016	2.31
9.0-10.0	36.4	30.5	15.6	14.9	CL	Gravelly lean clay with sand	19.3	29.4	51.3			0.00094	0.1845	2.22
10.0-11.0	32.9	52.7	22.9	29.8	CH	Gravelly Fat clay with sand	17.6	20.2	62.2	21	57.245	0.00097	0.3843	2.38
11.0-12.0	32.8	50.6	23	27.6	CH	Gravelly Fat clay with sand	15.5	20.8	63.7	-	-	0.00099	0.3654	2.53
12.0-13.0	36.8	52.9	25.5	27.4	CH	Gravelly Fat clay with sand	17.4	22.7	59.9	-	-	0.00106	0.3861	2.47
13.0-14.0	33.5	51.8	25	26.8	CH	Gravelly Fat clay with sand	17.5	24.6	57.9	-	-	0.00103	0.3762	2.56
14.0-15.0	32.8	55.1	24.5	30.6	CH	Gravelly Fat clay with sand	15.1	21.1	63.8	-	-	0.00099	0.4059	2.61

PROJECT No.:002		CONTRACT No.:002											
PROJECT LOCATION: YORK VILLAGE		BH OR TP ID: BH-2Y											
CLIENT(s): JTCA		CONTRACTOR (s):											
CONSULTANT(S): INNOVATIVE SOLUTIONS CONSULTANCY (ISC) SL LIMITED		Test ref: AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)											
TEST: Summary of Lab tests results													
Depths (m)	Natural Moisture Content (%)	Atterberg Limits Test		SOIL DESCRIPTION	USCS	Particle size distribution			Shear Box Test		Consolidation Test		Specific Gravity of soil solids (Gs)
		LL (%)	PL (%)			PI	SAND (%)	GRAVEL (%)	FINE (%)	FRICTION angle (φ) deg.	Cohesion (c) (kN/m ²)	Coefficient of consolidation on Cv (cm ² /sec)	
0.03-5.8	-	-	-	-	R	-	-	-	-	-	-	-	-
5.8-6.0	20.9	24.7	11.8	12.9	GC	18.4	54.8	26.8	37	12.67	-	-	2.28
6.0-7.0	25.4	20.8	14.1	6.7	GC-GM	10.5	49.7	39.8	36	10.65	-	-	2.21

7.0-8.0	23.8	23.1	17.2	5.9	GC-GM	Silty clayey gravelly	12.4	51.1	36.5	-	-	-	2.11
8.0-9.0	27.3	53.1	25.6	27.5	CH	Sandy fat clay	25.8	13.4	60.8	20	46.75	0.00095	2.38
9.0-10.0	28.9	54.2	26	28.2	CH	Fat clay with sand	17.7	5.8	76.5	-	-	0.00108	2.41
10.0-11.0	32.8	51.2	24.3	26.9	CH	Sandy fat clay	35.4	5.9	58.7	22	53.16	0.00104	2.48
11.0-12.0	37.5	50.9	25.2	25.7	CH	Sandy fat clay	31.9	3.8	64.3	-	-	0.00098	2.24
12.0-13.0	36.3	51.8	25.6	26.2	CH	Sandy Fat clay	33.0	0.8	66.2	-	-	0.00096	2.27
13.0-14.0	34.8	56.9	27.3	29.6	CH	Fat clay	14.1	0.0	85.9	-	-	0.00103	2.39
14.0-15.0	33.8	52.7	25.2	27.5	CH	Sandy Fat clay	39.0	1.2	59.8	-	-	0.00092	2.43



Appendix XI: Site Photos



Figure 3: York BH-1 Machine Setup



Figure 4: York BH-1 Site Overview



The table below contains summarized Triaxial Unconsolidated Undrained (UU) laboratory test results as an excerpt from the data sheets.

Borehole ID	Depth(m)	Cell pressure, σ_1 (kg/cm ²)	Strain rate (%/min)	Deviatory Stress σ_1 (kg/cm ²)	Undrained Shear strength (kg/cm ²)	Deviatory stress at failure $\Delta\sigma$ (kg/cm ²)	Axial Strain at Failure ϵ (%)
BH-1Y	7.0	0.59	1	2.16	0.79	1.57	8.0
	9.0	0.71	1	2.15	0.72	1.44	7.5
	11.0	0.92	1	2.6	0.84	1.68	6.0
BH-2Y	9.0	1.41	1	3.06	0.83	1.65	5.5
	11.0	0.88	1	2.44	0.78	1.56	7.0

Failure Criterion: Maximum deviatory stress



Figure 5: York BH-1 Drilling Process



Figure 6: York BH-1 Rock-Coring Process



Figure 7: York BH-1 Rock Cored



Figure 8: York BH-1 SPT Blow Counts



Figure 11: York BH-1 SPT Sample @ 6.0m



Figure 12: York BH-1 SPT Sample @ 7.0m



Figure 9: York BH-1 Rock Sample



Figure 10: York BH-1 SPT Sample @ 5.0m



Figure 13: York BH-1 SPT Sample @ 8.0m



Figure 14: York BH-1 SPT Sample @ 9.0m



Figure 15: York BH-1 SPT Sample @ 10.0m



Figure 16: York BH-1 SPT Sample @ 11.0m



Figure 19: York BH-1 SPT Sample @ 14.0m



Figure 20: York BH-1 SPT Sample @ 15.0m



Figure 17: York BH-1 SPT Sample @ 12.0m



Figure 18: York BH-1 SPT Sample @ 13.0m



Figure 21: York BH-1 SPT Completed



Figure 22: York BH-2 Machine Setup



Figure 23: York BH-2 Rock-Coring Process



Figure 24: York BH-2 Rock Cored



Figure 25: York BH-2 Drilling Process



Figure 26: York BH-2 Rock Samples



Figure 27: York BH-2 SPT Blow Counts



Figure 28: York BH-2 SPT Sample @ 6.0m



Figure 29: York BH-2 SPT Sample @ 7.0m



Figure 30: York BH-2 SPT Sample @ 8.0m



Figure 31: York BH-2 SPT Sample @ 9.0m



Figure 32: York BH-2 SPT Sample @ 10.0m



Figure 33: York BH-2 SPT Sample @ 11.0m



Figure 34: York BH-2 SPT Sample @ 12.0m



Figure 35: York BH-2 SPT Sample @ 13.0m



Figure 36: York BH-2 SPT Sample @ 14.0m



Figure 37: York BH-2 SPT Sample @ 15.0m



Figure 38: York BH-2 SPT Completed



Figure 39: York Trial Pit-1 Overview



Figure 40: York Trial Pit-1 Terminated @ 0.4m Due to Rock



Figure 41: York Trial Pit-1 Terminated and Backfilled



Figure 42: York Trial Pit-2 Terminated @ 0.5m Due to Rock



Figure 43: York Trial Pit-2 Terminated and Backfilled



Figure 44: A dug Pit at one of York's neighborhoods.



Appendix XII: Laboratory Test Photos



Figure 45: Delivered Soil Samples at the Laboratory



Figure 46: Drying of Soil Samples



Figure 47: Weighing of Empty Pan before Sieve Analysis



Figure 48: Weighing Soil Sample for Sieve Analysis



Figure 49: Performing Sieve Analysis



Figure 50: Weighing of Retained Soil Sample



Figure 51: Atterberg Limit Test Equipments Setup



Figure 52: Performing Atterberg Limit Test



Figure 53: Separated Groove



Figure 54: Closed Separation Groove



Figure 55: Weighing Scale



Figure 56: Weighing of Empty Cans



Figure 57: Weighing of Moist Soil



Figure 58: Oven drying of Soil Samples



Figure 59: Direct Shear Box Equipment



Figure 60: Performing Direct Shear Box Test



Figure 61: A Specimen in the Shear Box (Cylindrical shaped)



Figure 62: A Sheared (horizontal) Test Specimen



Figure 63: Performing Specific Gravity Test



Figure 64: Unconfined Compression Test Equipment



Figure 65: Compressive Test on Rock Sample



Figure 66: Tri-axial Test Equipment

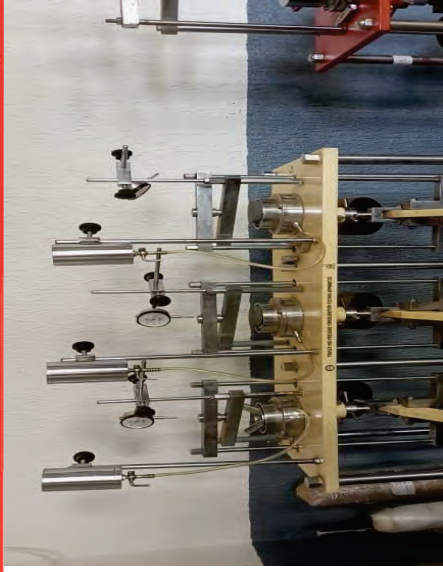
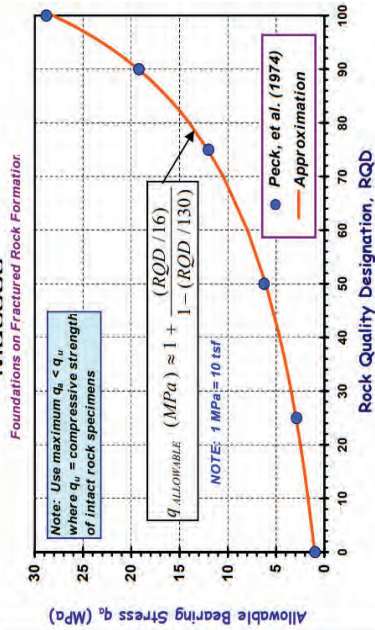


Figure 67: 1D Consolidation Test Equipment

Appendix XIII: References

Allowable Bearing Stresses on Rock Masses



Correlation with soil mechanical properties [61]

Despite its many flaws, it is usual practice to correlate SPT results with soil properties relevant for geotechnical engineering design. SPT results are in situ test measurements, and not as subject to sample disturbance, and are often the only test results available, therefore the use of correlations has become common practice in many countries.

An approximate relationship cited in the US Army Corp of Engineers engineering manual publication on sheet pile design developed after Terzaghi and Peck (1948) and Teng (1962), shows in the table below the relationship (specifically) for SPT N values and bulk density of soil correlated to relative density and referred to in the engineering manual as moist unit weight in per units, converted to metric values in the table [61]

Relative Density	SPT N value	Bulk Density (kg/m ³)
Very loose	0 - 4	< 1600
Loose	5 - 10	1500 - 2000
Medium	11 - 30	1750 - 2100
Dense	31 - 50	1750 - 2245
Very Dense	> 50	> 2100

Laboratory Attachment of the Testing Institution, Test Period, Tester Name, Confirmed Qualified Person Name And Their Signatures.

Test institution	Fourah Bay College (F.B.C) Ing. Momooh Missisquot Chief Laboratory Officer Contact: +23279020754 Signature: [Signature] Ing. Foday Bangura Contact: +23279353763 Signature: [Signature] Dr. Abdal A. Koroma (Head of Civil Engineering Department F.B.C) Contact: +23279353763 Signature: [Signature]
Tested by	
Confirmed by	
Test duration	Term: 16-12-2021 to 27-12-2021 York: 18-12-2021 to 30-12-2021



**FINAL GEOTECHNICAL INVESTIGATION REPORT
FOR THE CONSTRUCTION OF EDSA SUBSTATION
AT TOMBO (MADINA) WESTERN RURAL
FREETOWN.**



PREPARED FOR: JICA

PREPARED BY: Innovative Solutions
Consultancy SL Limited

JANUARY 2022

INNOVATIVE SOLUTIONS CONSULTANCY (SL) LTD.
ENGINEERING, SCIENTIFIC AND BUSINESS CONSULTING.
75 Smart Farm off Wilkinson Road Freetown.



**FINAL SUBSURFACE INVESTIGATION REPORT
FOR THE PROPOSED CONSTRUCTION OF
EDSA SUBSTATION**

AT

MADINA

WESTERN AREA RURAL DISTRICT

SIERRA LEONE

Prepared for:

JICA

By:

Innovative Solutions Consultancy SL LTD

75 Smart Farm off Wilkinson Road

Freetown

Sierra Leone

JANUARY 2022



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EXECUTIVE SUMMARY

A subsurface investigation was conducted at the proposed EDSA Substation site at TOMBO (Madina town), Western Area District of Sierra Leone. The geotechnical investigation process consisted of the drilling of two (2) boreholes with SPT to a proposed maximum depth of 15.0m each using a GY100 SPT Rotary machine and two (2) trial pits to a proposed maximum depth of 3.0m each. Standard Penetration Test (SPT) was conducted at every 1.0m interval in each borehole on to the maximum depth of 15.0m or lower depths when bed rock was encountered. The borings and trial pits were dispersed across the entire site so as to adequately capture the prevailing subsurface stratigraphy of the site. Borehole drilling test was conducted strictly in adherence to all applicable geotechnical Engineering and ASTM standards. Soil Samples were collected at each depth interval and visually classified.

The area is dominated by moderately weathered Lateritic rock (Gabbroic rock). Rock outcrops were observed. Moderately weathered Lateritic rock (Gabbroic rock) were encountered during the course of investigation. Different soil constituents were observed at the surface and subsurface, but as excavation progressed, the same constituents were observed but with a slight change in color. The surficial soil color was observed to be reddish brown to brown as we excavated downward.

From the results of field investigation couple with our knowledge of the local geology of the area, the site is overlain by a moderately weathered Lateritic rock (Gabbroic rock). Beneath this layer of moderately weathered Lateritic rock (Gabbroic rock) are successive layers of varying depths of reddish brown, dense to very dense clayey sand. Groundwater was encountered in all the boreholes.

The current level of investigation has indicated no adverse geological and geotechnical effects. Therefore, from a geotechnical perspective, the site is considered suitable for the proposed development.



Due to the existence of high bearing pressure and incompressible rock at the near surface, shallow foundations have been recommended for the various anticipated proposed facility. Isolated or raft footings are considered appropriate for the proposed facility. All footings should be designed for a minimum allowable bearing pressure of 1.0MPa at 1.5m for a safe stress distribution to the strata underneath. This report also provides guidelines to aid in the construction of the proposed structures with respect to excavation and earthworks based on the results of the subsurface investigation.



1.0 INTRODUCTION

This report shows the findings obtained from the subsurface investigation that was conducted at the site of the proposed EDSA Substation situated at Madina. The site is located at Madina town some meters away from Tombo town, Western Area rural District of Sierra Leone. The site is predominantly on a flat triangular surface land with dimension of 50.0m by 58.0m by 74.0m and an area of approximately 1446.76m².

At the time of investigation, the site was largely characterized by dry waterlogged grasses bounded by existing building structures and a football field.

The motive of this investigation is to characterize the site geology and the various soil conditions, describe the native surface and subsurface soils, compute the allowable bearing pressure, and determine their engineering properties by means of 2 no. of boreholes in-situ test (standard penetration test) and trial pits to provide required geotechnical design information of the site. The investigation also includes preliminary geotechnical engineering recommendations to assist with the construction of the proposed development at the site. This report is therefore geared towards providing factual interpretation of data obtained from both the field and laboratory tests of the subsurface materials across the site. The interpreted subsurface conditions and available project details would then be used to prepare engineering guidelines on the geotechnical and structural design for the proposed structures and other ancillary facilities, including construction considerations, which could influence design decisions.



2.0 SITE AND PROJECT DESCRIPTION

2.1 Location and Description of Site

The site for the proposed construction of **EDSA SUBSTATION** is located at Madina town some meters away from Tombo town, Western Area rural District of Sierra Leone. The site is predominantly on a flat triangular surface land with dimension of 50.0m by 58.0m by 74.0m and an area of approximately 1446.76m².

At the time of investigation, the site was largely characterized by dry waterlogged grasses bounded by existing building structures and a football field. The access leading to the site area starts from Waterloo-Madina-Tombo highway/Peninsula road and lead through an unpaved road.

There is no tree within the project site, and even the surroundings except up the Peninsula Mountains. The whole site has distinct moderately weathered Lateritic rock (Gabbroic rock) on the surface overlain by some dry grasses. During the rains, there are huge runoffs flows through the site and do not seem to seep but drained down into the near-by communities according to the indigenes.

2.2 Proposed Development:

The Proposed Project contains the following:

- i. EDSA Substation



3.0 GEOLOGIC SETTING

3.1 Regional Geology

The Project site is located within the FREETOWN IGNEOUS COMPLEX which is part of an apparently funnel-shaped body of gabbroic igneous rocks of which the greater part lies out to the sea. The Complex consists of a 6km thick series of cumulate rocks of gabbroic composition, containing layers of dunite, troctolite, olivine-gabbro, Leucogabbro and anorthosite. Freetown Complex is intruded into the gneisses of the Kasila Group and overlain by sediments of the Bullom Group whose lower beds are of Eocene age. Sedimentations structures such as cross-bedding are common in the gabbro layers and some 6,000m of thickness is exposed. The Complex has been reliably dated as 193Ma and the outcrop limits define an arc. Layering dips radially inwards from this arc, and a hypothetical "center" is deduced to lie 16km WSW of York. The layering may be divided into 4 major zones on the basis of large-scale variations in mineralogy and topographic expression. Each zone can be seen as the result of a single magmatic event. The base of each zone is Olivine-rich, and the top anorthositic. Within the zones are many rhythmic units on a hectometer scale, and within each rhythm is a centimeter-to-meter scale banding. Both zones and rhythms tend to be more Olivine-rich at their bases and Plagioclase-rich at their tops, so in effect rhythms are small-scale duplications of zones. Rhythmic layering and banding is more developed in the basal portions of zones and rhythms, while massive, lenticular anorthositic rocks, which are locally transgressive into overlying rocks, characterized the tops of zones. Mineralogically, the Freetown Complex displays few of the characters expected in large layered intrusions. The minimal cryptic layering present is unrelated to height above the base of a zone or rhythm. Order of cumulus crystallization is Ilmeno-magnetite as immiscible droplets, Olivine, Pyroxene, Plagioclase; this gives rise to the following stratigraphy of rhythms and zones;



TOP: Anorthosite-Leucogabbro-Gabbro-Olivine gabbro-Troctolite

Bottom: Ilmenomagnetite-rich-Troctolite.

Sulphides are ubiquitous but occur in small amounts, either as crystallized droplets of immiscible liquid trapped as inclusions in Olivine or Plagioclase, or as late-stage of hydrothermal veins and replacements.

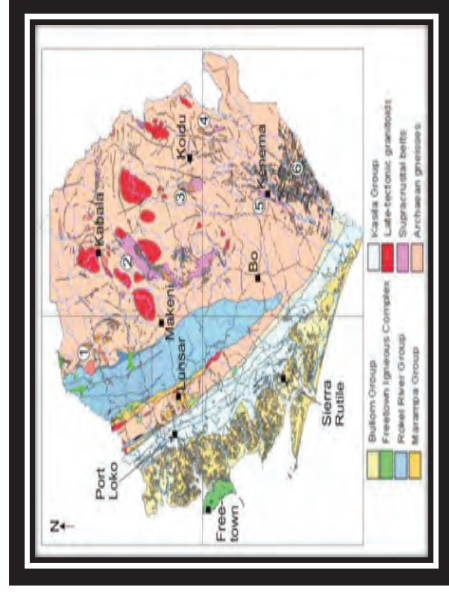


Figure 1: The Geologic Map of Sierra Leone



3.2 Local Geology of the Proposed Site

The Local geology of Madina-Tombo project site can be found within the stratigraphic geologic unit of Freetown Igneous Basement Complex that form part of an apparently funnel-shaped body of gabbroic rocks and are moderately well-exposed forming the Peninsula mountains which overlain the whole Western area of Freetown and some part of Western rural area including the project site. There is high weathering effect right across the complex as can be evidence within Freetown and the project site.

There is distinct Gabbroic bedrock spread across the surface of the whole project site and even the surroundings. These surface gabbroic bed rocks can be extended to the depth of 5.0m subsurface layers and the weathering effect increases as you drill down the subsurface as evidence by the two (2) boreholes drilled with gravels, clayey and sand encountered beyond the depth of the weathered gabbroic rock



Figure 2: Section of the proposed site



4.0 WORK PROCEDURES AND METHODS

4.1 General

The scope of this subsurface investigation and of this report is to obtain information about the stratigraphy and soil behavior at the site to determine geotechnical design parameters for the design and construction of the proposed structures. The objective of this subsurface investigation is to obtain sufficient geotechnical parameters at the site by means of drilling 2 no. boreholes with Standard Penetration Test (SPT), and detailed laboratory testing program to determine the following with respect to the design and construction of the proposed structures:

- i. Physical and engineering properties of the soils beneath
- ii. Depth of bedrock;
- iii. Nature of the bedrock and its physical and engineering properties;
- iv. The Engineering properties and behavior of the soils beneath the founding depth.
- v. Depth and nature of groundwater

Scope of field investigation and laboratory testing program:

- Drilling of two (2) no boreholes across the site using a GY- 100 drilling machines to depth of 15.0m or refusal and perform standard penetration test at every 1.0m interval.
- Collection of disturbed soil samples at depth interval of 1.0m using the split spoon sampler
- Collection of undisturbed soils samples at depth interval of 6.0m using the U100 sampler.



- Excavation of two (2) no of trial pits across the site to a depth of 3.0m or refusal.
- Carry out ground water monitoring to determine the level of ground water.
- Carry out detailed laboratory testing program of selected soil samples collected.
- Preparation of factual and engineering reports of the subsurface investigation.

4.2 Procedure for Geotechnical Investigation

Step I: Desk Review of applicable geological records and project documentations

This is where in all relevant information that are available, are collected. The information which needs to be collected is as follows:

- Site plan
- Type, size & importance of the structure
- Loading conditions
- Previous geo-technical reports if any
- Topographical maps

Step II: Preliminary Reconnaissance

A site visit was made to get a general idea of the topography and geology of the site. Current information about the geological area will be compared with the information obtained from the previous information. The following will be noted:

- Photographs of the site and its neighborhood
- Access to the site for workers and equipment



- Sketch of all utility post, walkways, drainage etc.
- Available utility services such as water and electricity
- Sketches of topography including all existing structures, ground depressions, hill, swamps & so on

Step III: Detailed Site Exploration

The objectives of a detailed soils exploration are:

- To determine the geological structure, which should include the thickness, sequence and extent of the soil strata
- To determine the ground water condition
- To obtain disturbed and undisturbed samples for laboratory tests
- To conduct in-situ tests

This will include undertaking SPT, Excavation of trial pit, undertaking in situ testing, and collection of soil samples.

Step IV: Soil and rock sampling

The subsurface soils were continuously logged and visually classified in accordance with the Unified Soil Classification System (USCS). Representative soil samples were collected at regular intervals within the exploratory borings and subsequently transported to the geotechnical laboratory for testing and analysis.

The samples collected were placed in an air tight sealed sampling bags to avoid any moisture escape.

For each borehole, disturbed soil samples were collected at depth interval of 1.0m and undisturbed soil samples at depth interval of 6.0m. All the samples were correctly labeled and identified. The samples were logged in the field and returned to the Soils and Materials laboratory for detailed examination by the geotechnical engineer. Soil samples were tested for water content determination and geotechnical index characterization.



Step V: Laboratory Testing

The objectives of laboratory tests are:

- To classify the soils
- To determine soil strength, failure stresses and strains, stress-strain response and settlement parameters.

All laboratory tests will be conducted in strict compliance with applicable ASTM Standards. Tests will be conducted on samples of soils.

Step VI: Geotechnical Analyses and Report Writing

Two types of reports will be prepared and issued for geotechnical investigation in the course of this investigation. These are daily fieldwork logs and final reports.



5.0 DESCRIPTION OF FIELD INVESTIGATION

5.1 Surveying of Test Locations

The proposed project site was surveyed and the actual borehole locations were mapped within the foot print of the structures to aid in the easy characterization and identification of geological materials found within the various boreholes across the site.

All boreholes and in-situ test locations were set out by the client and site engineer at various locations across the site.

5.2 Performing Standard Penetration Testing (SPT)

5.2.1 Drilling of SPT boreholes using GY-100 SPT machine.

Drilling of boreholes was carried out using GY-100 drilling rigs due to time, effectiveness, portability and flexibility of this equipment. Two (2) no SPT boreholes were drilled to a targeted boring depth of 15.0m. At every interval of 1.0m SPT testing was done and soil coring was done at every 6.0m interval. Rock coring was done in all of the boreholes due to moderately weathered Lateritic rock (Gabbroic rock) encountered during the investigation. Samples were collected at every point where SPT tests were conducted using the split spoon sampler and at 6.0m interval using U100 sampler. After removing the samples from the sampler, they were then placed in an air tight sampling bags to retain the natural moisture content. Groundwater was monitored in all the drilled holes after completion of the drilling process using 2-inches PVC pipes. The holes were first cleaned with the drilling fluid bailed out and the pipe was inserted and left for 24 hours. The pipe was then removed and the depth of ground water was measured from the water traces. Ground water was encountered in all the boreholes. After the drilling process the SPT's were correctly identified and verified by the Site Engineer. Samples were then transported from the site to the laboratory for testing.



GY-100 SPT machine Specification

Rig Weight: 605Kg

Bit Type: Diamond Bit

Drilling diameter: 150mm

Drilling Tower Height: 6m

Hammer Weight: 63.5kg

Maximum drilling depth: 30m

Table 1: SPT N-Values For Boreholes

Depth(m)	BH-1M N-values	BH-2M N-values	Average N-values
1.0	R	R	-
2.0	-	-	-
3.0	-	-	-
4.0	-	-	-
5.0	R	25	25
6.0	35	R	35
7.0	R	R	
8.0	31	17	24
9.0	R	31	31
10.0	R	33	33
11.0	53	43	48
12.0	54	50	52
13.0	R	44	44
14.0	R	47	47
15.0	R	46	46



Note: R mean Refusal

5.2.1.1 Comment on Results:

Generally, it is expected for the SPT N-value to increase with depth. However, due to some geological interruptions (weak seams found within soil layers), moderately weathered Lateritic rock (Gabbroic rock) etc.), fluctuations in the SPT N-value were observed.

If some weak strata are confined by harder strata there will be a rise in SPT N-value on the harder materials and a drop for the weak layer. Also, if during the operation, boulders are met there will be an increase in the N-value due to the resistance from the rocks; however, a drop in the N-value will be observed when the rock has been broken. Thus, there will be large variations when either of these conditions is encountered during investigation.

5.2.2 Rotary drilling method

This method was adopted to perform the subsurface investigation in all the boreholes. It is a method which involves the use of a rotary drill with rotating thick-walled, hollow, drill rods usually attached to a bit. A downward pressure applied during rapid rotation advances the drill rods which in turn rotate the drill bit that cuts the material. Drilling fluid is circulated through the rods as boring progresses. The fluid washes the cuttings from the borehole, maintains and stabilizes it and also cools down the bit. The drill cuttings are screened and separated from the drilling fluid which is then recirculates. As the borehole progresses through this method, the drill rods and bit are pulled out of the hole and are replaced with the required sampling device. This method is fast, and provides excellent sampling and in-situ testing data due to minimal disturbance to the soils at the bottom of the borehole prior to sampling. It is effective in all soil types.



Undisturbed Sampling is reached when relatively undisturbed push tube samples of 100mm diameter would be taken at intervals to borehole termination depth in cohesion-less soil in each borehole. After the sampling the tube is then pulled to the surface, labeled and wrapped top and bottom to prevent natural moisture content from escaping.

Standard penetration tests (SPTs) were carried out at 1.0m intervals as specified by client to borehole termination depth. The SPT is carried out in a borehole by driving a 63.5kg (140lb) weight over a calibrated distance of 760mm.

The weight is released such that standard penetration of 450mm length can be read off the top of the casing on the drill wire rope. As the weight is lifted and dropped, the number of blows required to penetrate the sampler (spoon) to 75mm is recorded.

This process of releasing the weight to cause penetration of the sampler through the soil is recorded for every 75mm of sampler penetration until full length of 450mm penetration is achieved or otherwise penetration refusal. The samples from the SPT spoon are recovered as disturbed sample.

Disturbed samples were taken at 1.0m and at every 2.0m starting from 3.0m to the final depth. Disturbed samples of all materials are also recovered during drilling. Disturbed samples are samples collected from the boring tools, from inside of the shell brought to the surface during drilling.

The table below shows the locations, depth of drilled and depth of termination of the various boreholes:



Table 2: Boreholes Locations, Their Depth of Termination and Depth to Bed Rock

Sr No	Borehole No	UTM Coordinates		Elevation (m)	Proposed Maximum Depth of Excavation (m)	Depth of Termination (m)	Depth to Boulder/Bed Rock (m)	Depth to Water table (m)	Comments
		Eastings	Northings						
1	BH-1M	709660	909520	46.7	15.0	15.0	0.0	3.5	Borehole was Successfully drilled to the targeted depth.
2	BH-2M	709640	909526	46.9	15.0	15.0	0.0	3.3	Borehole was Successfully drilled to the targeted depth.



5.3 Excavation of Trial Pit

A minimum of two (2) trial pits were excavated manually to a proposed maximum depth of 3m or refusal within each of the identified homogenous locations. The trial pits have dimension of approximately 1.5m x 1.5m x variable depths. For each trial pit excavated, disturbed soil samples were collected at an interval of 1m and placed in air tight sampling bags to retain the natural moisture content.

Excavation in trial pit was discontinued when fresh or slightly weathered bedrock was encountered.

Upon completion, the trial pits at the different locations were then backfill using the excavated material with slight level of compaction. The table below gives the coordinates of Trial pits



Table 3: Trial Pits Locations, Their Depth of Termination and Depth to Bed Rock

Sr No	Trial Pit No	UTM Coordinates		Elevation (m)	Proposed Maximum Depth of Excavation (m)	Depth of Termination (m)	Depth to Bed Rock/Boulder (m)	Depth to Water table (m)	Comments
		Eastings	Northings						
1	TP-1M	709670	909510	46.4	3.0	0.65	0.65	N/A	Trial pit was Terminated at 0.65m depth due to moderately weathered Lateritic rock (Gabbroic rock) encountered.
2	TP-2M	709652	909556	47.1	3.0	0.5	0.5	N/A	Trial pit was Terminated at 0.5m depth due to moderately weathered Lateritic rock (Gabbroic rock) encountered.



5.4 Soil and Rock sampling

5.4.1 Soil sampling

The subsurface soils were continuously logged and visually classified in accordance with the Unified Soil Classification System (USCS). For each borehole, samples were collected at depth interval of 1.0m for all the boreholes or at such depth where it becomes very clear of a change in material properties. For each sampling depth two samples were collected. One sample for natural moisture content determination and the other for Index properties tests; such as particle size distribution and Atterberg Limits was placed in a polythene bag and immediately sealed to avoid any moisture escape. All the samples were correctly labeled and identified. The samples were logged in the field and returned to the Soils and Materials laboratory for detailed examination by the geotechnical engineer. Soil samples were tested for water content determination and geotechnical index characterization.

Sample handling, storage and laboratory testing

All bulk and relatively disturbed and undisturbed samples from the temporary storage area were transported to the Soils and Materials laboratory for analyses. Samples were stored in air-conditioned space under conditions conducive for the preservation of the sample in-situ moisture content until used for laboratory testing.



5.5 Rock Coring

A sampling barrel and coring bit is advanced through rock by the application of downward pressure during rotation. Circulating fluid facilitates coring action, removes ground-up material from the hole, while also cooling the bit. The rate of advancement is controlled to obtain the maximum possible core recovery. Once the rock is cored through, the sample is retrieved immediately by bringing the drill rods holding the cored sample to the ground surface. HQ size barrels are used for coring. Rock Coring and Sampling will be done in accordance with **ASTM D2113 “Standard Practice for Rock Core Drilling and Sampling of Rock for Site Exploration”**.

Diamond Drilling

The term diamond core drilling comes from the ‘diamond bit’ drill used during the drilling process. This drill bit is made up of a group of small, industrial grade diamonds set into a metallic matrix, as the rock is drilled, the diamond which is the hardest mineral will cut through the rock minerals and into the rock mass thereby accumulating the rock sample into the core barrel.

At borehole locations where rock is encountered, consultant will employ diamond core drilling to drill through the rock mass. Diamond core drilling will be done in accordance to standard practice describe in ASTM D2113. In summary, diamond core drilling will be properly done by the consultant as;

The diamond bit which is attached to the barrel is then attached to a drill rod which measures to about 10 feet in length. More sections of pipe can be attached to the top of the drill rod, allowing greater depths to be drilled as needed. Therefore, the number of rods attached to the top of the drill rod will determine the depth that has been drilled. To keep the coring moving smoothly through the rock, Consultant will ensure that the drill is well lubricated with



water in order to prevent overheating or sticking that will lead to shrinkage of the core tube.

For optimum drilling and core extraction, Consultant will pay greater attention to the drilling for efficient evaluation of subsurface conditions. Consultant will also ensure that drilling remains efficient; the pressure, rotation speed and water circulation will be carefully monitored. When a certain amount of depth is reached, the core tube is lifted to the surface using the cable to allow for the removal of the solid core.

Extraction and Handling of Core

Core extraction and handling were done strictly using the guideline stated in ASTM D2113. In order to extract the core, the drill rod rotates the diamond bit together with the core tube and spins it into the ground. As the drill bit bores through the rock, solid rock is taken into the circular opening of the core tube at the end of the bit, and is then recovered at the surface by unscrewing the diamond bit at the end of the core tube. Once the core is recovered at the surface it is measured and stored in core trays to await analysis. Standard core trays which can hold for about 3 meters of cores will be used to hold to cores.

Core Recovery

The core recovery parameters describe the quality of core recovered from the drilled boreholes. This can help in the characterization of the rock strength.



Measurement of core recovery

The easiest way to characterize the amount of material recovered during rock coring is to calculate “the core recovered”. The measurement of recovery is a key part of the core logging process, which includes recording geological information and taking samples. Consultant will ensure that depth measurement and blocking will be done correctly, the consultant will determine the core recoveries using the following parameters:

- **Total Core Recovery (TCR):** this is the percentage of core recovered regardless of quality or length measured relative to the length of the total core run.

i.e. $\text{Total length of core recovered TCR} = (\text{total length of core recovered} / \text{total core run}) \times 100$

- **Rock Quality Designation (RQD):** This is a modified core recovery percentage in which the lengths of all sound rock core pieces greater than 100 mm in length are summed and divided by the total length of the core. Rock pieces that are not hard and sound will not be included in computing the RQD. The purpose of the soundness requirement is to downgrade rock quality where the rock has been altered and/or weakened by weathering. For the RQD evaluation, lengths must be measured along the centreline of the core.

i.e. $\text{RQD} = (\text{Length of core pieces greater than 100mm} / \text{total core run}) \times 100$

- **Solid Core Recovery (SCR):** This is the percentage of solid drill core, regardless of length recovered at full diameter, measured relative to the length of the total core run.



i.e. SCR= (Total length of core in pieces greater than core diameter/ Total length of core run) × 100

5.6 Schedule of Laboratory analysis of samples

The following tests were conducted on boreholes soil samples:

- Determination of in-situ moisture contents as per ASTM D2216
- Determination of Atterberg limits as per ASTM D4959
- Determination of particle size distribution as per ASTM D 422
- Determination of shear parameters using the direct shear box test ASTM D 3080
- Determination of Specific gravity test of soil particles
- Determination of Trial axial compression Test (UU)
- Determination of Unconfined compression test
- Determination of Consolidation test

All tests were conducted in strict accordance with the respective ASTM Standards and were done at the geotechnical laboratory. The detail laboratory test report sheets are included in the Appendix with the results summarized in the 'Laboratory Results' Section of this Report.

5.7 Density Results Obtained

The densities were obtained from the correlation table that was developed by the US Army Corps of Engineering. This is a correlation obtained from the SPT N-Values and the natural densities of the soil.

The density of the soil is a relevant factor in the determination of bearing capacity of soils for the purpose of slope stability, determination of pressures



on underlying strata for the calculation of settlement and the design of ground structures.

From the results obtained, it is seen that the density increased with depth in most test layers depending on the number of blows of that layers. However, due to soft soils, increase in soil moisture and low compaction between layers this trend is slightly deviated as a decrease in the density with depth was observed.

Table 4: Density Results

Depth (m)	BH-1M Density	BH-2M Density	Average Density
1.0	-	-	-
2.0	-	-	-
3.0	-	-	-
4.0	-	-	-
5.0	-	1765	1765
6.0	1879	>2100	1879
7.0	>2100	>2101	-
8.0	1865	1754	1754
9.0	>2100	1867	1867
10.0	>2100	1869	1869
11.0	2120	1978	1978
12.0	2121	1999	1999
13.0	>2100	1989	1989
14.0	>2100	1996	1996
15.0	>2100	1994	1994



6.0 Development of Geotechnical Design Parameters

We used the results of field tests to determine the relevant geotechnical design parameters for the proposed Warehouse and Multi-Storey foundation design using well-established correlations that have been found to be suited to local geology and subsurface conditions. The correlations use Standard Penetration Test (N) values corrected for overburden and hammer efficiency.

6.1 Correction of Field SPT N-Values

Based on the standard practice, field SPT N values were corrected to SPT N₆₀ and SPT N₁₆₀. For the SPT N corrected for field procedures the SPT N-Values were multiplied by the hammer correction factor which was a product of the:

EH= hammer efficiency: 55% (china hand dropped = 0.55)

CB= borehole diameter correction: 1 (between 65 and 115mm)

CR = rod length factor: 0.75 (between 3- 4m)

Cs = sampling method factor: 1 (standard sampler)

N₆₀ = SPT N corrected for field procedures

Thus $N_{60} = (CB \times CR \times CS \times N) / 0.6$

Further correction of SPT N-value considering the overburden for the first five meters for each borehole is given by

$N_{160} = CN \times N_{60}$ Where CN = overburden factor

Pa = atmospheric pressure; 100kPa (this was done using the average in-situ density values).

The N₁₆₀ = SPT N-value corrected for field procedures and overburden stress. The allowable bearing capacity was computed using Pecks 1974 formula



Qa = 10.6 N₁₆₀

Where; Qa = Allowable Bearing Capacity in KPa

N₁₆₀ = Corrected field N values for hammer efficiency and overburden stress.

Based on this formula we were able to compute the allowable bearing capacity at the various depths of the borings. This formula assumed a factor of safety of 3 and an allowable settlement of 25mm.

6.2 Bearing Capacity Calculation Using Strength of Rock

The rock bearing capacity of the foundation layer was calculated using peck, et al. (1974) a chart developed for foundation on fractured rock formation. See reference for chart below on reference section.

6.3 Laboratory Testing and Results.

The laboratory tests were performed on the samples of disturbed and core samples. The tests were performed using according to relevant ASTM standards. The following tests were conducted in the samples collected:

- Natural Moisture Content – ASTM D 4959
- Particle Size Distribution (PSD) – ASTM D 2487
- Atterberg Limit (plasticity index, liquid limit and plastic limit) – ASTM D 4318
- Direct Shear Box Test – ASTM D 3080
- Specific gravity test of soil particles
- Trial axial compression Test (UU)
- Unconfined compression test
- Consolidation test

After conducting laboratory tests the samples were then classified according to the Unified Soil Classification System (USCS).



7.0 GEOTECHNICAL PROPERTIES OF SOIL STRATA ENCOUNTERED

7.1 General

Various soil strata were encountered during the course of investigation, for details of the strata encountered in both borings, see appendix V of this report. A site Plan showing the approximate locations of the boreholes is presented in Appendix I and II. The strata descriptions given in the boring logs are as a result of the careful examination and test of both disturbed and undisturbed samples collected. Relative density descriptions are based on the results of the in-situ penetration test and have not been amended to consider any overburden effects. The consistency of the cohesive strata is based on the visual assessment together with any available in-situ and laboratory test results.

The analysis, conclusions and recommendations contained in this report are based on the existing site conditions at the time of explorations and assume the boreholes are representative of the subsurface conditions throughout the site.

Any interpolation and extrapolation of strata from boreholes is an estimate only of the likely stratification and is subjected to the interpretation of the reader. The borehole logs should be read in conjunction with the General Notes on Borehole Logs. The description of the ground conditions and engineering interpretation therefore is based on the results of the boreholes and laboratory testing carried out. There may be ground conditions at the site which may have not been revealed by the investigation. If during construction, subsurface conditions at the site are found to differ from those encountered during the exploration, we should be notified at once so that we may review these conditions and reconsider our recommendations where necessary.



7.2 Strata Encountered

The geology encountered across the site was anticipated from review of regional geology, In-situ and laboratory tests conducted and experience working in similar geological setting. A detailed description of subsurface conditions encountered in the soil borings are shown in the attached Borehole Logs in Appendix V. A summary of the subsurface conditions encountered in the soil's borings are presented below:

7.3. Geotechnical Properties of the Strata Encountered

It is observed that the subsurface stratigraphy across the site is nearly homogenous i.e, identical soil strata were found in almost all the boreholes drilled on the site. As a result, the following description is applicable to all the soil types encountered in all the boreholes. The following discussion summarizes the geotechnical properties of the strata as determined during the investigation.

Reddish to Brown hard residual Sandy lean Clays (CL)

Natural moisture contents determination made on samples of sandy lean clays indicated values of range between 18.9% and 31.7% at various depths. SPT test carried on this material recorded N values in the range 31-35, indicating hard conditions. Atterberg Limits determination gave liquid limits in the range of 30.8-36.4%, Plasticity Index in the range of 17.8-18.8%, indicating medium plasticity. Average cohesion and friction angle from shear box test indicated values of 32.99kPa and 28deg respectively, low to medium compressibility, swelling potential and moderately high bearing capacity (>100kPa). They are normally considered as fairly good foundation materials.



Reddish to Brown medium dense to dense residual Clayey Sands (SC)

with trace of gravels

Natural moisture contents determination made on samples of clayey sands indicated values of 21.8% to 31.8% at various boring depths. SPT N-values on this deposit recorded N values in the range 17->100, indicating medium dense to very dense conditions. This gives bearing strength greater than 100 KPa. Atterberg Limits determination gave liquid limits in the range of 22.9-31.8%, with an average of 29.16%. Plasticity Index in the range of 11.7-16.4%, indicating moderate plasticity. This soil has friction angles between the range of 33-34degrees with 13.66-14.67KPa cohesion.

Brown, very Dense Residual Lateritic Poorly graded sands with clay and gravels (SP-SC)

Natural moisture contents determination made on samples of poorly graded sands indicated values between 26.7%-36.9%. This is because of the depths at which they were encountered. These soils were found way down at depths greater than 9m. SPT tests carried on this deposit recorded N values in the range 43->100, indicating very dense conditions. Atterberg Limits determination gave values of liquid limits between 20.8% - 23.1%, Plasticity Index is of the range 4.4% - 5.7%, indicating very low plasticity.

Brown to Pink dense to very dense residual clayey gravels with trace of sands (GC)

Natural moisture contents determination made on samples of silty clays indicated values of range between 19.7% to 25.9% at various depths. SPT test carried on this material recorded N values in the range 24->100, indicating dense to very dense conditions. Atterberg Limits determination gave liquid limits in the range of 26.9-28.8%, Plasticity Index in the range of 12.5-14.9%, indicating medium plasticity. Cohesion and friction angle from shear box test indicated values 10.05kPa and 37deg respectively, with moderately high bearing capacity (>100kPa). They are normally considered as good foundation materials.



7.4 Ground water elevation

From the groundwater monitoring conducted in all the boreholes, ground water was observed in all the borings. However, the ground water was observed as far as 3.5m below. As a result, groundwater is not expected to significantly affect the design of foundations within these locations.

It is of engineering significance to note that the groundwater observations made during the course of our exploration provided an indication of the groundwater conditions of the site at the time of investigation. During some periods of the year, perched water could be present at various depths. Fluctuations in groundwater levels are also expected throughout the year depending upon variations in precipitation, runoff, evaporation, irrigation practice, man's activities and other hydrological factors not evident at the time of investigation. However, it should be noted that the field exploration was conducted during early dry season and as such the observed groundwater levels are the moderately and are expected to rise during the rains. As can be seen in the laboratory test results, the moisture content of samples collected were relatively low. Both measured moisture content and observed groundwater levels are expected to drastically increase during the raining season.



8.0 GEOTECHNICAL DESIGN PARAMETERS

8.1 Introduction

This section of the report provides engineering analyses and guidelines on the geotechnical design aspects of the project based on interpretation of Boring logs, results of field and laboratory testing and experienced gained in working with subsurface soil conditions of a similar nature to that existing at the proposed site and also project requirements. This section covers geotechnical guidelines for the following:

- i. Site preparations and earthworks
- ii. Foundation design criteria with respect to the proposed conceptual design
- iii. Pavement design considerations
- iv. Quality Control
- v. Limitations

From a geotechnical point of view, the site is considered suitable for the proposed development. However, its suitability is only verifiable when it is prepared as recommended herein:

8.2 Site Preparation and Grading

8.2.1 Site Preparation

Existing loose soils, debris and vegetation, if any, should be removed from beneath area to be graded and where new facilities will be located. It is expected that earthwork outside of building and equipment areas will be minimal and generally consist of excavations for new utility lines, subgrade preparation for hardscape and pavements, and slopes for drainage. The Project Geotechnical Engineer should check the bottoms of excavations for utility trenches and below pavements and hardscape. Soft, wet, or otherwise unsuitable material should be excavated to the depth and extent



8.0 GEOTECHNICAL DESIGN PARAMETERS

8.1 Introduction

determined by the Project Geotechnical Engineer and replaced with compacted fill. The bottoms of excavations, and the existing ground surface where new fill will be placed, should be scarified, moisture conditioned to at least 2 percentage points above optimum moisture content and compacted to at least 90% relative compaction. The maximum dry density and optimum moisture content for the evaluation of relative compaction should be determined in accordance with ASTM D 1557. All references to optimum moisture content and relative compaction in this report are based on this test method.

8.2.2 Fill Materials

Excavated materials determined by the geotechnical engineer to be satisfactory can be replaced as compacted fill. It is anticipated the majority of the excavated materials can be used as compacted fill following mixing of clayey and sandy soils. The geotechnical engineer should approve the fill material before placement. Imported soil should consist of predominately granular non-detrimentally expansive (Expansion Index less than 20) material free of organics, debris and rocks greater than 4 inches in any dimension. The EI of the material should be determined in accordance with ASTM D 4829. Geotechnical engineer should approve the soil to be used as fill prior to importation.

8.2.3 Fill and Backfill Placement and Compaction

Fill and backfill should be placed in 6- to 8-inch thick loose lifts, moisture conditioned to at least 2 percentage points above optimum moisture content, and compacted to at least 90% relative compaction. Fill and backfill placed within the upper 12 inches of finish grade beneath new pavements should be compacted to at least 95% relative compaction.



8.2.4 Cut and Fill Slopes

We recommend that any permanent cut or fill slopes be limited to 2H: 1V. Natural slopes on the property appear to be low (<5%) and do not require slope stability analysis. If slopes greater than 15% are produced by site grading activities, with building construction planned, slope stability should be addressed at those locations.

8.2.5 Surface Drainage

Final surface grades in the new structure and equipment area should be designed to collect and direct surface water away from the new features and toward appropriate drainage facilities. In general, we recommend that the ground adjacent to structures slope away at a gradient of at least 2%. Densely vegetated areas where runoff can be impaired should have a minimum gradient of at least 5% within the first 1.5m from the structure. Drainage patterns established at the time of fine grading should be maintained throughout the life of the project. Site irrigation should be limited to the minimum necessary to sustain landscape growth. Runoff water should be directed to suitable discharge facilities to reduce the potential for ponding at the toe of the slope. Weathered rock exposed on the face on the cut slope is expected to be readily erodible. Erosion protection such as erosion-resistant vegetation, commercial erosion control mats or other means should be provided to minimize sloughing and raveling.

8.3 Foundation Construction.

The Project Geotechnical Engineer should review and approve the foundation plans and observe foundation excavations prior concrete placement to check that foundation excavations extend into suitable material. The bottom of the foundation excavations should be clean and free of loose or sloughed material, debris and unsuitable material before concrete is placed.



8.4 Concrete Slab-On-Grade Floors

If concrete-slab-on-grade floors will be used, the subgrade surface beneath floor areas should be proof-rolled with a smooth-wheel roller prior to slab construction. Any soft, loose, or yielding areas should be removed to the depth and extent directed by the Project Geotechnical Engineer and replaced with suitable material. The subgrade surface should be maintained at or above optimum moisture content until concrete is placed for the slab. Where floor coverings will be placed, or if required due to proximity to the landfill, a plastic membrane at least 10 mils thick should be placed beneath the slab. The membrane should be underlain by a 4-inch thick layer of clean, free-draining crushed rock to provide uniform support for the slab and serve as a break to the rise of capillary moisture. It is recommended that a specialist be consulted regarding applicable membrane types and installation procedures where resistance to landfill gas migration is required. Current practice commonly includes a sand layer placed between the plastic membrane and the underside of the slab. The sand can provide a degree of protection to the membrane during construction. However, the sand layer absorbs water during concrete curing and allows the accumulation of water vapor on the bottom of the slab, considerably increasing the time required for slab moisture to reach a level suitable for installation of floor coverings. It is suggested that the concrete slab-on-grade be poured directly on the plastic membrane.

8.5 Expansive Soil Potential

The near-surface materials (upper 5 meter) consist of moderately weathered Lateritic rock (Gabbroic rock). The predominantly granular soils and rock are not expansive. Design for expansive soils is not required. If imported soils are used for earthwork, the proposed materials should be evaluated for expansion potential prior to import. The Project Geotechnical Engineer should approve imported soils prior to utilization.



8.6 Preparation

Excavation of footing should be evaluated by a qualified Geotechnical engineer or their representative to confirm suitable bearing conditions. Observations should confirm that all loose or soft materials, organics, old man-made fill, disturbed soils, have been removed.

Localized deepening and footing excavation be required where structural fill is used beneath footings to reach suitable bearing strata. In wet weather, the STRATUM clay at some locations within the influence zone of the foundation load will be prone to little disturbance. If those soils are seriously disturbed and softened, they will be unable to support the foundation without excessive settlement, in cases where such occur, the material should be removed and replaced with structural fill. In order to reduce the potential for such disturbance, we strongly recommend that a 175mm thick layer of ¾ inch –minus compacted gravel be placed on the exposed footing excavations, prior to constructing the footings.

8.7 Utility Trench

Any new utility trenches should be backfilled with compacted granular material containing less than 7% fines (passing number 200 sieves)

We recommend that an impermeable trench plug be installed to stop water before it reaches the structure envelop. We also refer all utility contractors to the Earthwork section of this report for discussion about potential problems with excavations at the site.



9.0 SUMMARY OF DESIGN PARAMETERS

Table 5: Computation of Safe Bearing Strength of Rocks Based on Rock core parameters

BORE HOLE ID	DEPTH TO BED ROCK (m)	ROCK DIAMETER (mm)	LENGTH OF ROCK CORE SAMPLES (m)	ROCK TYPE	DRY DENSITY (kg/m ³)	TOTAL CORE RECOVERY (TCR) (%)	SOLID CORE RECOVERY (SCR) (%)	RQD (%)	ALLOWABLE BEARING (MPa)
BH-1M	0.0	55	2.2	Laterite rock (Gabbroic rock)	2200	44	7.9	0	1.0
BH-2M	0.0	55	3.625	Laterite rock (Gabbroic rock)	2200	72.5	22.4	9.1	1.61



10.0 CONCLUSIONS AND RECOMMENDATIONS.

Subsurface investigation surveys were conducted at the site of the proposed EDSA Substation at Madina, Western Area Rural, Freetown, Sierra Leone. A detail field investigation was conducted at the site that has given a reasonably good level assessment of the subsurface stratigraphy to a maximum depth of 15.0m meters. However, all the soils in all the strata across the various sections were observed to be almost homogeneous and of almost the same engineering properties.

Based on the results of the geotechnical investigation and geological study, the following conclusions and recommendations have been made:

i. Site is underlain by competent geologic materials at shallow and deep depths.

Most of the sections of the site are underlain by moderately weathered Lateritic rock (Gabbroic rock) at shallow depth. These geologic materials have adequate bearing pressure to support building loads under various static and dynamic loading conditions.

ii. Overburden would need to strip.

Approximately 0.05m of organic topsoil, alluvia and colluvium overburden would have to be stripped to prepare the structure's foundations.

Note: The following rock parameters in tabular format below were used in computing the Unconfined Compressive Strengths of the cored rock samples submitted to the soils and materials laboratory at Fourah Bay College. Again, the parameters were extracted from the lab data sheets.

The test procedures were carried out in accordance with ASTM D 7012; method C (Previously ASTM D 2938).

Table 6: Computational Parameters used to obtain the Compressive Strengths of Rock Cored Samples.

Bore Hole/Rock IDs	Rock Diameter (mm)_D	Rock Length (mm)_L	Rock type	Failure load (KN)	Failure type	Unconfined Compressive Strength of Cored rock samples tested (MPa)	
						Per Location	Average Compressive strength of Cored rock samples tested across the site (MPa)
BH-1M	55	100.00	Laterite rock (Gabbroic rock)	116.458	Shear	48,4171	50.54161
BH-2M	55	115.00	Laterite (Gabbroic rock)	124.523	Shear	52,6661	



iii. **Site is considered geotechnical suitable for the proposed**

development.

The current level of investigation has indicated no adverse geological and geotechnical effects that would preclude the proposed structures to the desire design and level of service. Consequently, from a geotechnical perspective, the site is considered relatively suitable for siting the structures' foundations at shallow depths. In other words, shallow foundation is recommended for all the proposed building structures.

iv. **Shallow foundation recommended for the proposed structures.**

Based on the nature of the soil and rock encountered, shallow foundations are recommended for the proposed developments. Isolated or mat foundations are recommended. The recommended minimum founding depth for the proposed structure is 1.5m, designed for a minimum allowable bearing pressure of 1.0MPa.

v. **Presence of Ground water.**

Absolutely groundwater was encountered in all the boreholes and at an average depth of 3.4m. As a result, the impact of groundwater in the proposed area has limited adverse impact to the foundation structure. Considering both the expected seasonal and ocean rise of groundwater level, hence allowance should be given in the foundation design for the likely potential of submerged foundation soils.



vi. **Site are underlain by competent geologic materials at shallow depth**

Most of the sections of the site are underlain by moderately weathered Lateritic rock (Gabbroic rock). These geologic materials have adequate bearing pressure with the recommended founding depth to support structural loads under various static and dynamic loading conditions.

vii. **Seismic belt and grade in the project site**

By reviewing the historical seismic activities of the area, and from the site investigation conducted, there are no evidences of seismic fault belt and seismic grade in the project site.

viii. **Effect of flood and seasonal rain, and direction of drainage and its effect.**

From visual assessment and results obtained from the site investigation, the proposed facility would not be affected by any flooding situation and the drainage pattern of this site is directed towards the natural drainage system, which is approximately 100m from the site. The effect posed by changing in seasonal rain is infinitesimally delegable.

ix. **Presence of Expansive or collapsible soils**

From the subsurface investigation, expansive or collapsible soils were encountered but at a depth outside the influence zone of foundation load. Countermeasures to the presence of expansive soils include the design of special foundation measures such as raft foundations and piled foundations, and drainage and protection measures to prevent cyclic drying or wetting of the material. The near-surface materials (upper 5 meter) consist of moderately weathered Lateritic rock (Gabbroic rock). The

predominantly granular soils and rock are not expansive. Design for expansive soils is not required

x. Presence of Weak inorganic soils

The soils encountered are mostly Clayey sand, poorly graded sand with clay and moderately weathered Lateritic rock (Gabbroic rock) in all the boreholes and. However, these materials have moderate to high bearing pressures. Boreholes drilled and trial pits excavated reveal moderately weathered Lateritic rock (Gabbroic rock).

xi. High bearing strength of material below the founding depth

For the boreholes drilled besides the thin layer of organic top soil, the bearing strength of the subsurface material show high bearing capacity values from top to bottom of each investigated borehole. Hence, a shallow foundation type is recommended for the proposed section. Alternatively, the foundation type to be used for the construction in this area should be mat/raft.

Subsequently, from evaluating the bearing capacity and geological setting of the section, gives well appreciable bearing capacity and good geological setting. Hence, this section will be suitable for the construction of the EDSSA Substation facility.

11.0 LIMITATIONS.

This report has been prepared strictly for the exclusive use of the client, their architects and engineers or contractors for aiding in the design and construction of the proposed development. It is the addressee's responsibility to provide this report to the appropriate design professionals, building officials, and contractor to ensure correct implementation of the recommendations provided herein.

The facts, comments and conclusions presented in this report are based upon information obtained from our field investigations and laboratory tests. Conditions between, or beyond our test pits may vary from those encountered. Unanticipated soil conditions and seasonal soil moisture variations are commonly encountered and cannot be fully determined by merely taking soil samples, or excavating test pits. Such variations may result in changes on our recommendations and we require that additional expeditions be made to attain a properly constructed project. Therefore, some contingency fund is recommended to accommodate such potential extra costs.

Our work has been conducted in general conformance with standard of care in the field of Geotechnical engineering currently produced in Sierra Leone for projects of this nature and magnitude. No warranty expressed or implied expression on the information presented in this report. By utilizing the design recommendations in this report, the client acknowledges and accepts the risk and limitations of development at the site, as outlined within the report.

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12.0 APPENDICES

Appendix i: Map showing boreholes and trial pit locations on the proposed site at MADINA.



GEOTECHNICAL REPORT FOR THE PROPOSED CONSTRUCTION OF EDISA SUBSTATION AT MADINA 45

GEOTECHNICAL INVESTIGATION MAP SHOWING TRIAL PIT DRILLED LOCATIONS

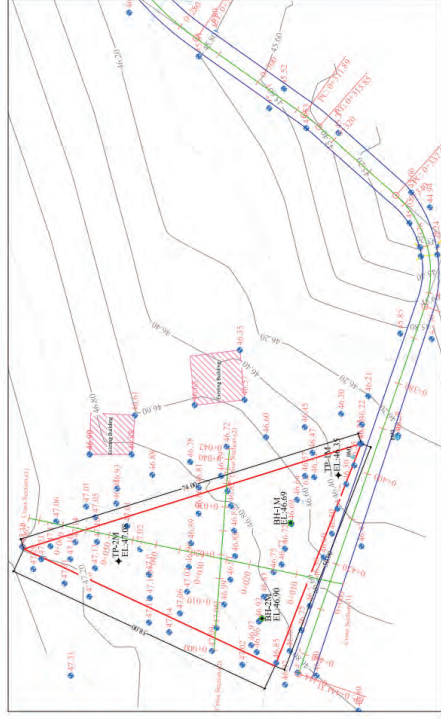


GEOTECHNICAL REPORT FOR THE PROPOSED CONSTRUCTION OF EDISA SUBSTATION AT MADINA 46



GEOTECHNICAL REPORT FOR THE PROPOSED CONSTRUCTION OF EDSA SUBSTATION AT MADINA 47

Appendix II: Topographic Survey Map showing boreholes and trial pit locations on the proposed site at MADINA.



GEOTECHNICAL REPORT FOR THE PROPOSED CONSTRUCTION OF EDSA SUBSTATION AT MADINA 48

Appendix III: Computation of safe Bearing Capacity Based on the Corrected SPT N-Values Perborehole

Sample depth (m)	Soil Description	USCS	N ₆₀	In situ density (kg/m ³)	Unit weight of soil (kN/m ³)	Total stress (kPa)	Ground water encountered at 3.0m	Unit weight of water (kN/m ³)	Pore water pressure (kPa)	Effective stress (kPa)	P _a (kPa)	Overburden correction factor (C ₁)	Combined SPT correction factor	N ₆₀	N ₁₆₀	Q _a (Mpa)
6	Sandy lean clay with gravel	CL	35	1879	18.79	112.74	2.5	9.81	24.525	88.215	100	1.064704	0.779167	27	29	0.31
7	Clayey sand with gravel	SC	R	>2100	-	-	3.5	9.81	34.335	-	100	-	0.779167	-	-	>1.0
8	Clayey sand with gravel	SC	31	1865	18.65	149.2	4.5	9.81	44.145	105.055	100	0.975645	0.779167	24	24	0.25
9	Clayey sand with gravel	SC	R	>2100	-	-	5.5	9.81	53.955	-	100	-	0.779167	-	-	>1.0
10	Clayey sand with gravel	SC	R	>2100	-	-	6.5	9.81	63.765	-	100	-	0.870833	-	-	>1.0
11	Clayey sand with gravel	SC	53	2120	21.2	233.2	7.5	9.81	73.575	159.625	100	0.791497	0.870833	46	37	0.39
12	Clayey sand with gravel	SC	54	2121	21.21	254.52	8.5	9.81	83.385	171.135	100	0.764417	0.870833	47	36	0.38

A11-90-BH-1M

13	Poorly graded sand with clay and gravel	SP-SC	R	>2100	-	-	-	9.81	9.5	-	-	-	93.195	100	-	0.870833	>1.0
14	Poorly graded sand with clay and gravel	SP-SC	R	>2100	-	-	-	9.81	10.5	-	-	-	103.005	100	-	0.870833	>1.0
15	Poorly graded sand with clay and gravel	SP-SC	R	>2100	-	-	-	9.81	11.5	-	-	-	112.815	100	-	0.870833	>1.0

BH ID	Sample depth (m)	Soil Description	USCS	Moisture content (%)	Soil density (kg/m ³)	Unit weight of soil (kN/m ³)	Total stress (kPa)	Ground water encountered at 3.3m	Unit weight of water (kN/m ³)	Pore water pressure (kPa)	Effective stress (kPa)	P _a (kPa)	Overburden correction factor (C _u)	Combined SPT correction factor	R60	R160	Q _a (MPa)
A11-91 BH-2M	5	Clayey gravel with sand	GC	25	1765	17.65	88.25	1.7	9.81	16.677	71.573	100	1.182022	0.6875	17	20	0.22
	6	Clayey gravel with sand	GC	R	>2100	-	-	2.7	9.81	26.487	-	100	-	0.779167	-	-	>1.0
	7	Clayey sand with gravel	SC	R	>2101	-	-	3.7	9.81	36.297	-	100	-	0.779167	-	-	>1.0
	8	Clayey sand	SC	17	1754	17.54	140.32	4.7	9.81	46.107	94.213	100	1.030255	0.779167	13	14	0.14
	9	Sandy lean clay	CL	31	1867	18.67	168.03	5.7	9.81	55.917	112.113	100	0.944435	0.779167	24	23	0.24
	10	Sandy lean clay	CL	33	1869	18.69	186.9	6.7	9.81	65.727	121.173	100	0.908442	0.870833	29	26	0.28
	11	Poorly graded sand with clay	SP-SC	43	1978	19.78	217.58	7.7	9.81	75.537	142.043	100	0.839054	0.870833	37	31	0.33
	12	Poorly graded sand with clay	SP-SC	50	1999	19.99	239.88	8.7	9.81	85.347	154.533	100	0.804432	0.870833	44	35	0.37

13	Poorly graded sand	SP	44	1989	19.89	258.57	9.7	9.81	95.157	163.413	100	0.78227	0.870833	38	30	0.32
14	Poorly graded sand	SP	47	1996	19.96	279.44	10.7	9.81	104.967	174.473	100	0.75707	0.870833	41	31	0.33
15	Poorly graded sand	SP	46	1994	19.94	299.1	11.7	9.81	114.777	184.323	100	0.736564	0.870833	40	30	0.31

Appendix IV: Computation of Safe Bearing Capacity Based on Average Corrected SPT N-Values across the site

BH-ID	Sample depth (m)	Soil Description	USCS	N_{60}	Initial density (kg/m^3)	Unit weight of soil (kN/m^3)	Total stress (kPa)	Ground water encounter d. at 3.3m	Unit weight of water (kN/m^3)	Pore water pressure (kPa)	Effective stress (kPa)	P_a (kPa)	Overburden correction factor (CF)	Combined SPT correction factor	N_{60}	N_{160}	Q_a (kPa)
BH-2M	5	Clayey gravel with sand	GC	25	1765	17.65	88.25	1.6	9.81	15.696	72.554	100	1.174003	0.6875	17	20	0.21
	6	Clayey gravel with sand	GC	35	1879	18.79	112.74	2.6	9.81	25.506	87.234	100	1.070674	0.779167	27	29	0.31
	7	Clayey sand with gravel	SC	R	>2100	-	-	3.6	9.81	35.316	-	100	-	0.779167	0	-	>1.0
BH-2M	8	Clayey sand with gravel	SC	24	1754	17.54	140.32	4.6	9.81	45.126	95.194	100	1.024932	0.779167	19	19	0.20
	9	Clayey sand with gravel	SC	31	1867	18.67	168.03	5.6	9.81	54.936	113.094	100	0.94033	0.779167	24	23	0.24
	10	Clayey sand with gravel	SC	33	1869	18.69	186.9	6.6	9.81	64.746	122.154	100	0.904787	0.870833	29	26	0.28
	11	Clayey sand with gravel	SC	48	1978	19.78	217.58	7.6	9.81	74.556	143.024	100	0.836172	0.870833	42	35	0.37

12	Poorly graded sand with clay	SP-SC	52	1999	19.99	239.88	8.6	9.81	84.366	155.514	100	0.801891	0.870833	45	36	0.38
13	Poorly graded sand	SP	44	1989	19.89	258.57	9.6	9.81	94.176	164.394	100	0.779933	0.870833	38	30	0.32
14	Poorly graded sand	SP	47	1996	19.96	279.44	10.6	9.81	103.966	175.454	100	0.75495	0.870833	41	31	0.33
15	Poorly graded sand	SP	46	1994	19.94	299.1	11.6	9.81	113.796	185.304	100	0.734611	0.870833	40	29	0.31



Appendix V: Borehole and Trial Pit Logs

A. BOREHOLE LOGS PROFILE FOR BH-1M

BOREHOLE LOCATION: MADINA						
BOREHOLE NUMBER: BH-1M						
MAXIMUM DETH DRILLED: 15.0m						
DATE	STARTED: 14-12-2021					
	COMPLETED: 14-12-2021					
DEPTH TO GROUND WATER: 3.5m						
BH ID	Depth (m)	Legend	Soil Description	USCS	Moisture Content (%)	Field N-Value
BH-1M	0.0-0.05		Dark soft organic material	-	-	-
	0.05-4.5		Reddish brown moderately weathered Lateritic rock (Gabbroic rock)	GR	-	R
	4.5-5.0		Reddish moderately weathered gabbroic rock	GR	-	R
	5.0-6.0		Reddish moist hard Sandy lean clay with gravel	CL	18.9	35
	6.0-7.0		Reddish moist very dense Clayey sand with gravel	SC	21.8	R
	7.0-8.0		Reddish moist dense Clayey sand with gravel	SC	25.7	31
	8.0-9.0		Reddish moist very dense Clayey sand with gravel	SC	23.9	R
	9.0-10.0		Reddish moist very dense Clayey sand with gravel	SC	26.4	R
	10.0-11.0		Reddish moist very dense Clayey sand with gravel	SC	31.8	53
	11.0-12.0		Red moist very dense Clayey sand with gravel	SC	30.7	54
	12.0-13.0		Brown moist very dense Poorly graded sand with clay and gravel	SP-SC	33.8	R
13.0-14.0		Brown moist very dense Poorly graded sand with clay and gravel	SP-SC	31.1	R	
14.0-15.0		Brown moist very dense Poorly graded sand with clay and gravel	SP-SC	35.4	R	



B. BOREHOLE LOGS PROFILE FOR BH-2M

BOREHOLE LOCATION: MADINA						
BOREHOLE NUMBER: BH-2M						
MAXIMUM DETH DRILLED: 15.0m						
DATE	STARTED: 15-12-2021					
	COMPLETED: 15-12-2021					
DEPTH TO GROUND WATER: 3.3m						
BH ID	Depth (m)	Legend	Soil Description	USCS	Moisture Content (%)	Field N-Value
BH-2M	0.0-0.05		Dark soft organic material	-	-	-
	0.05-4.0		Reddish moderately weathered Lateritic rock (Gabbroic rock)	GR	-	R
	4.0-5.0		Brown moist dense Clayey gravel with sand	GC	19.7	25
	5.0-6.0		Pink moist very dense Clayey gravel with sand	GC	25.9	R
	6.0-7.0		Brown moist very dense Clayey sand with gravel	SC	24.9	R
	7.0-8.0		Reddish brown moist medium dense Clayey sand	SC	26.9	17
	8.0-9.0		Brown moist hard Sandy lean clay	CL	31.7	31
	9.0-10.0		Brown moist hard Sandy lean clay	CL	28.9	33
	10.0-11.0		Brown moist very dense Poorly graded sand with clay	SP-SC	26.7	43
	11.0-12.0		Brown moist dense Poorly graded sand with clay	SP-SC	30.6	50
	12.0-13.0		Brown moist dense Poorly graded sand	SP	32.1	44
13.0-14.0		Brown moist dense Poorly graded sand	SP	31.7	47	
14.0-15.0		Brown moist very dense Poorly graded sand	SP	36.9	46	



C. BOREHOLE LOGS PROFILE FOR TP-1M

		TRIAL PIT LOCATION: MADINA			
		TRIAL PIT NUMBER: TP-1M			
		MAXIMUM DETH DRILLED: 0.65m			
		DATE:	STARTED: 14-12-2021		
		COMPLETED: 14-12-2021			
		DEPTH TO GROUND WATER: N/A			
TP ID	Depth (m)	Legend	Soil Description	USCS	Moisture Content (%)
TP-1M	0.0-0.05		Dark soft organic material	-	-
	@ 0.65m and below		Reddish brown moderately weathered Lateritic rock (Gabbroic rock)	GR	-

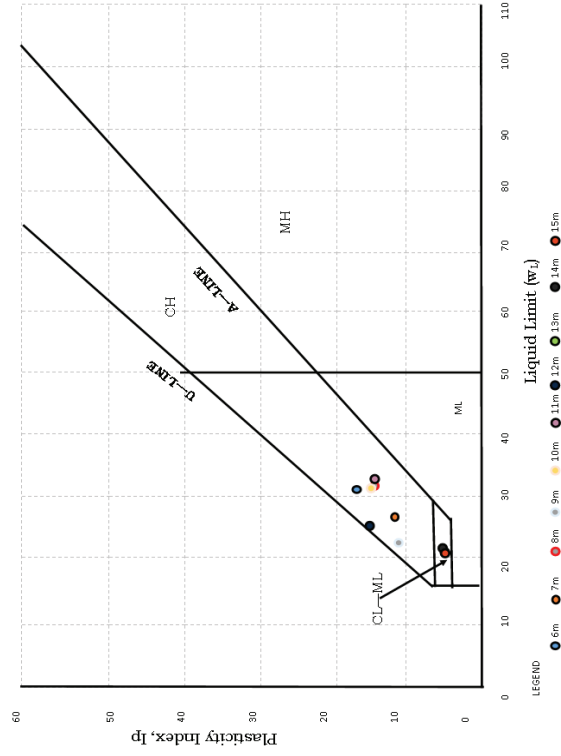
A11-94



Appendix VI: Boreholes and Trial pits Representation of Atterberg Limits Using A-Line Chart.

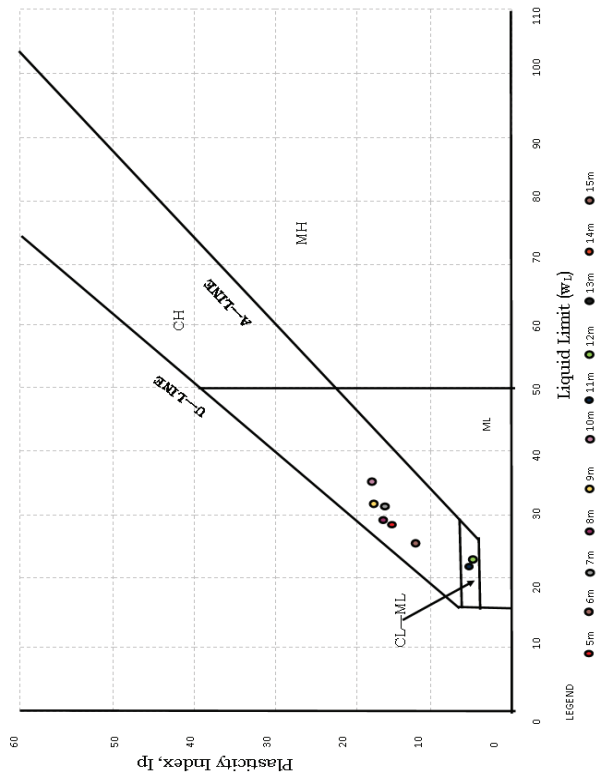
A-Line charts given below is a representation of the Atterberg limit of the soils encountered at different layers during laboratory testing. The test was conducted at the various depths for every borehole and trial pit locations.

A-LINE CHART FOR BH-1M





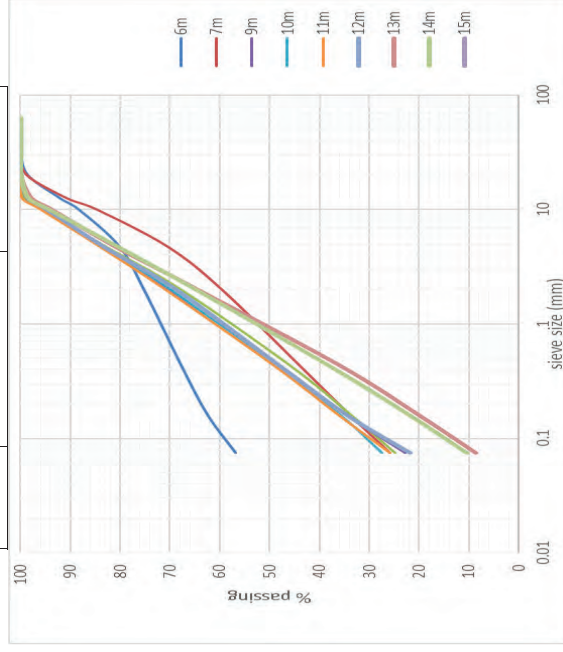
A-LINE CHART FOR BH-2M



Appendix VII- Sieve Analysis Charts of Boreholes and Trial Pits

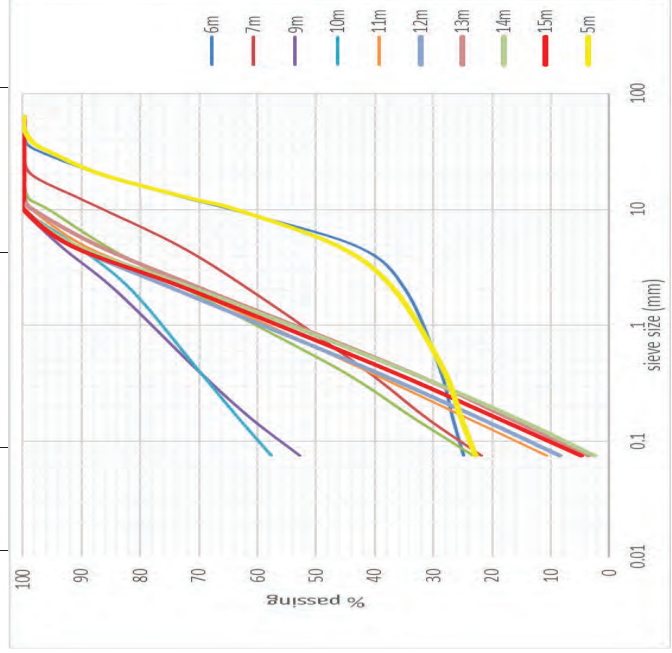
SIEVE ANALYSIS CHART FOR BOREHOLES AT SELECTED DEPTHS

PROJECT TITLE: Geotechnical Investigation for the proposed construction of EDSA Substation at Madina	GRAIN SIZE DISTRIBUTION CHART	CLIENT: JICA
FINES	SAND	BOREHOLE NO: BH-1M
	GRAVEL	



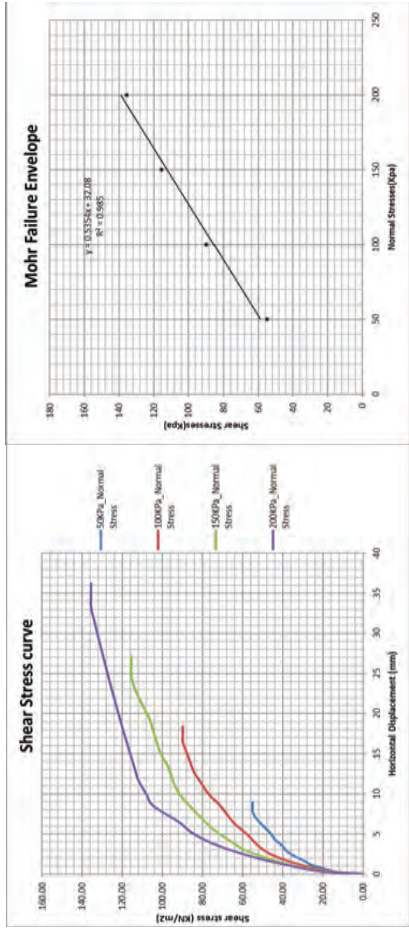


PROJECT TITLE: Geotechnical Investigation for the proposed construction of EDSA Substation at Madina	GRAIN SIZE DISTRIBUTION CHART	CLIENT: JICA BOREHOLE NO: BH-2M
	FINES	SAND
		GRAVEL



Appendix VIII- Shear Parameters
SHEAR BOX TEST RESULTS FOR COLLECTED SAMPLES

SHEAR BOX RESULT FOR BH-1M @ 6.0m

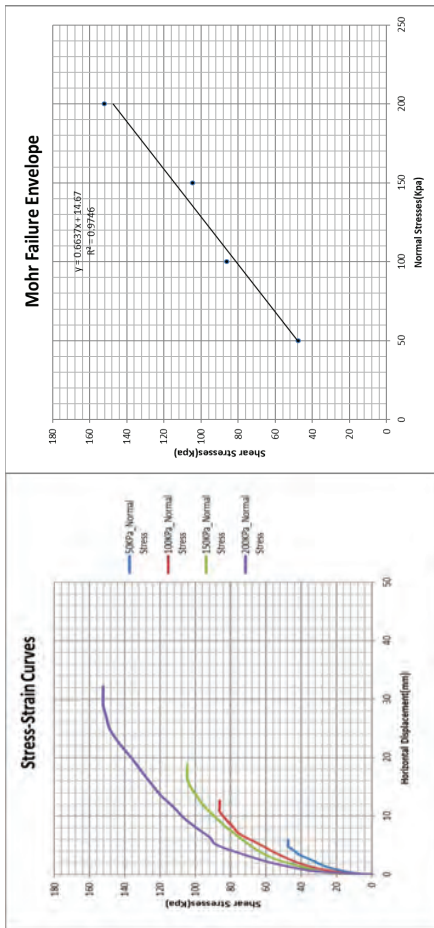


Load (kN)	Normal Stress (kN/m ²)	Shear Stress (kN/m ²)
0.153	50	55.00
0.306	100	89.83
0.459	150	115.50
0.612	200	135.67

Angle of internal friction, $\phi=28^\circ$; Cohesion, $C = 32.082\text{KPa}$



SHEAR BOX RESULT FOR BH-1M @ 8.0m

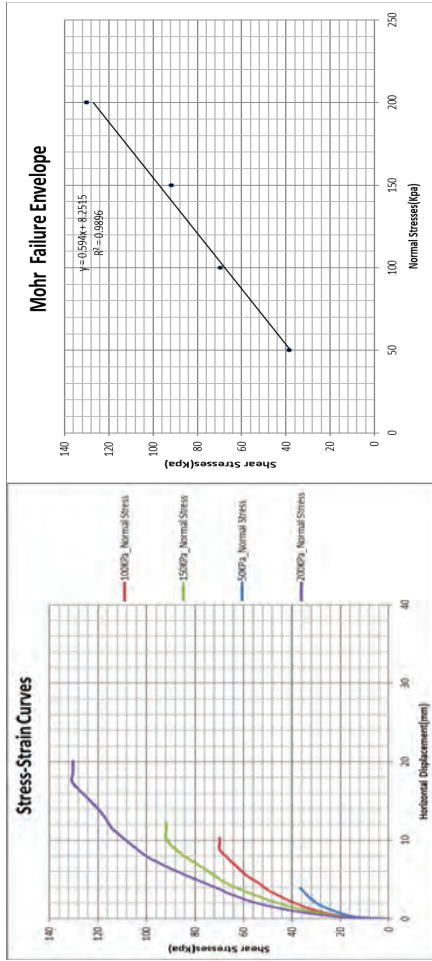


Load (kN)	Normal stress (kN/m ²)	Shear stress (kN/m ²)
0.153	50	47.67
0.306	100	86.17
0.459	150	104.5
0.612	200	152.17

Angle of internal friction, $\Phi=34^\circ$; Cohesion, $C = 14.67\text{KPa}$



SHEAR BOX RESULT FOR BH-1M @ 13.0m

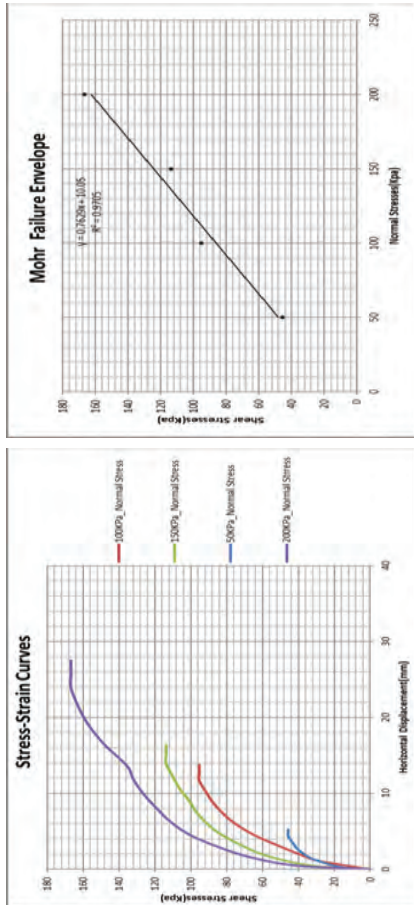


Load (kN)	Normal stress (kN/m ²)	Shear stress (kN/m ²)
0.153	50	38.5
0.306	100	69.67
0.459	150	91.67
0.612	200	130.167

Angle of internal friction, $\Phi=31^\circ$; Cohesion, $C = 8.25\text{KPa}$



SHEAR BOX RESULT FOR BH-2M @ 5.0m

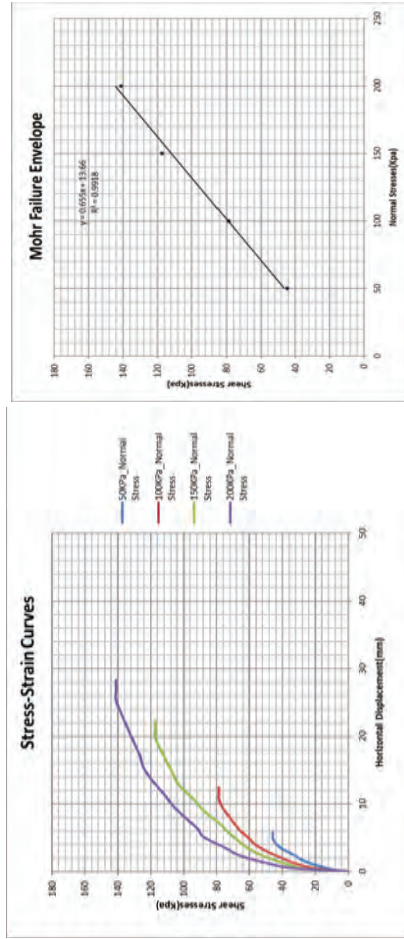


Load (kN)	Normal stress (kN/m ²)	Shear stress (kN/m ²)
0.153	50	45.8
0.306	100	95.33
0.459	150	113.667
0.612	200	166.83

Angle of internal friction, $\Phi=37^\circ$; Cohesion, $C = 10.05\text{KPa}$



SHEAR BOX RESULT FOR BH-2M @ 7.0m



Load (kN)	Normal stress (kN/m ²)	Shear stress (kN/m ²)
0.153	50	44.83
0.306	100	78.83
0.459	150	117.33
0.612	200	141.17

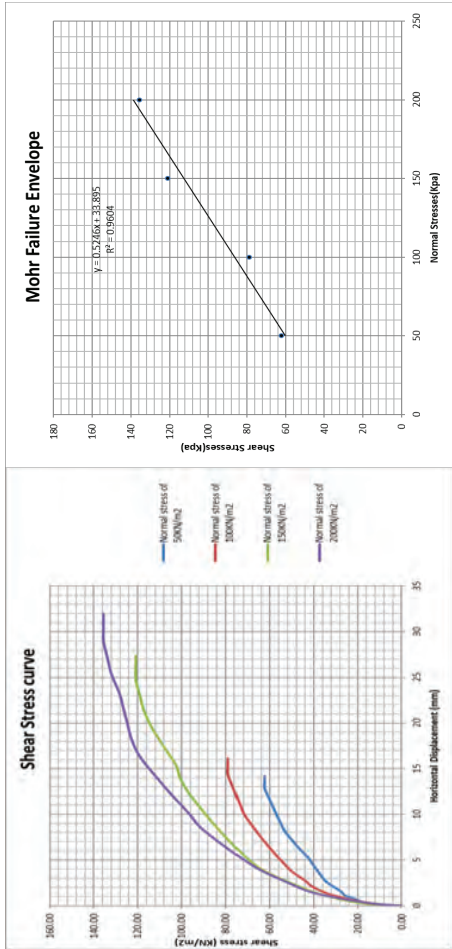
Angle of internal friction, $\Phi=33^\circ$; Cohesion, $C = 13.66\text{KPa}$



Appendix IX - SPT N-Value Charts Variation of SPT N-Values Versus Depth

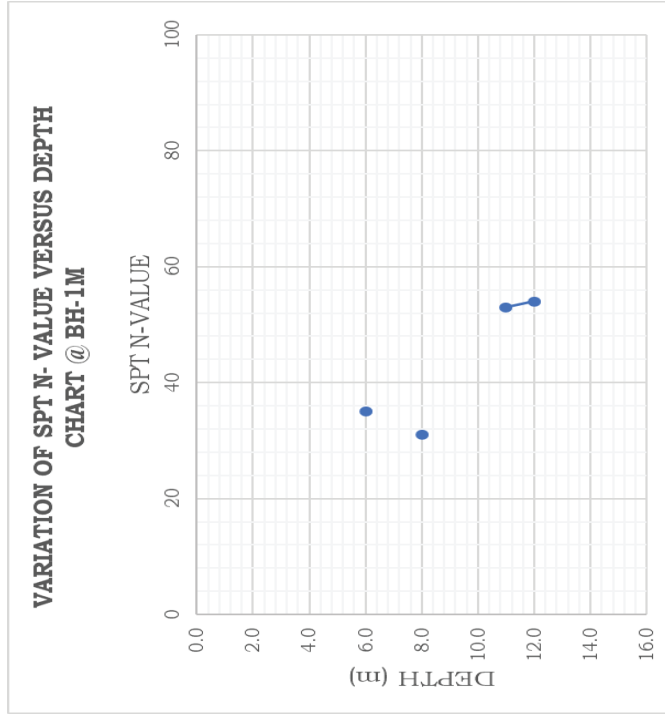
VARIATION OF SPT N-VALUES VERSUS DEPTH FOR BH-1M

UTM Coordinate: 709660E, 909520N Elevation: 46.7m



Load (kN)	Normal Stress (kN/m²)	Shear Stress (kN/m²)
0.153	50	62.33
0.306	100	78.83
0.459	150	121.00
0.612	200	135.7

Angle of internal friction, $\phi=28^\circ$; Cohesion, $C = 33.91\text{KPa}$



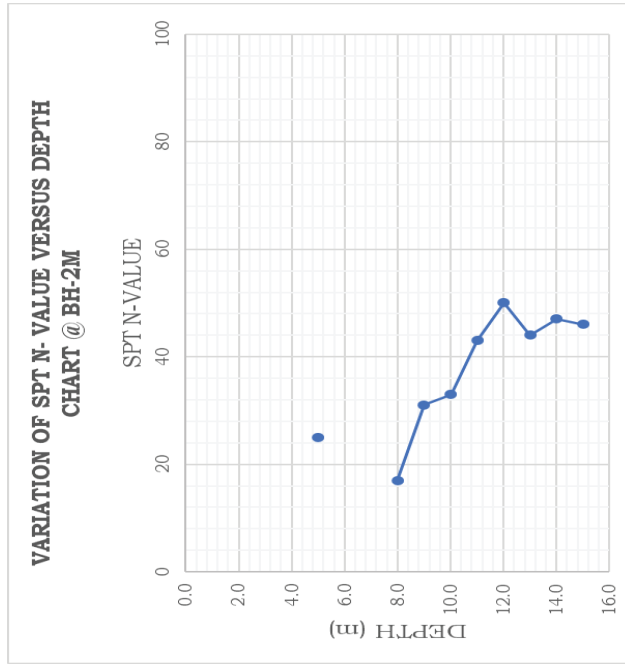
INNOVATIVE SOLUTIONS CONSULTANCY (SL) LTD.
ENGINEERING, SCIENTIFIC AND BUSINESS CONSULTING.
 75 Smart Farm off Wilkinson Road Freetown.



VARIATION OF SPT N-VALUES VERSUS DEPTH FOR BH-2M

UTM Coordinate: 709640E, 909526N

Elevation: 46.9m



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 75 Smart Farm off Wilkinson Road Freetown.



Appendix X - Summary of Laboratory Test Results for Boreholes and Trial Pits

SUMMARY OF LABORATORY TEST RESULTS FOR BOREHOLES

PROJECT No.:001		CONTRACT No.:001										
PROJECT LOCATION:MADINA		BH OR TP ID: BH-1M										
CLIENT(s): JICA		CONTRACTOR (s):										
CONSULTANT(s): INNOVATIVE SOLUTIONS CONSULTANCY (ISC) SL LIMITED		Test ref: AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)										
TEST: Summary of Lab tests results												
Depths (m)	Natural Moisture Content (%)	Atterberg Limits Test			USCS	SOIL DESCRIPTION	Shear Box Test			Consolidation Test		Specific gravity of soil solids (Gs)
		LL (%)	PL (%)	PT			Friction angle (φ) deg.	Cohesion (c) (kN/m ²)	Coefficient of consolidation Cv (cm ² /sec)	Compression Index Cc		
Date: 14-12-2021												
Particle size distribution												
		SAND (%)	GRAVEL (%)	FINE (%)								
0.05-1.0	-	-	-	-	GR	Moderately weathered Laterite rock (Gabbroic rock)	-	-	-	-	-	-
1.0-5.0	-	-	-	-	GR	Moderately weathered Laterite rock (Gabbroic rock)	-	-	-	-	-	-

GEOTECHNICAL REPORT FOR THE PROPOSED CONSTRUCTION OF EDSA SUBSTATION AT MADINA

GEOTECHNICAL REPORT FOR THE PROPOSED CONSTRUCTION OF EDSA SUBSTATION AT MADINA

5.0-6.0	18.9	30.8	13.0	17.8	CL	Sandy lean clay with gravel	23.3	19.8	56.9	28	32.082	0.00086	0.1872	2.21
6.0-7.0	21.8	27.9	16.2	11.7	SC	Clayey sand with gravel	52.6	21.5	25.9	-	-	-	-	2.36
7.0-8.0	25.7	31.7	16.9	14.8	SC	Clayey sand with gravel	58.1	17.1	24.8	34	14.67	-	-	2.28
8.0-9.0	23.9	22.9	11.6	11.3	SC	Clayey sand with gravel	60.6	16.6	22.8	-	-	-	-	2.28
9.0-10.0	26.4	30.8	15.5	15.3	SC	Clayey sand with gravel	56.2	16.4	27.4	-	-	-	-	2.42
10.0-11.0	31.8	32.8	17.9	14.9	SC	Clayey sand with gravel	58.3	15.9	25.8	-	-	-	-	2.44
11.0-12.0	30.7	25.8	10.6	15.2	SC	Clayey sand with gravel	61.6	16.5	21.9	-	-	-	-	2.56
12.0-13.0	33.8	20.8	15.9	4.9	SP-SC	Poorly graded sand with clay and gravel	72.4	18.9	8.7	31	8.25	-	-	2.64
13.0-14	31.1	21.6	16.4	5.2	SP-SC	Poorly graded sand with clay and gravel	70.2	19.4	10.4	-	-	-	-	2.60

GEOTECHNICAL REPORT FOR THE PROPOSED CONSTRUCTION OF EDISA SUBSTATION AT MADINA

14.0-15.0	35.4	20.7	15.8	4.9	SP-SC	Poorly graded sand with clay and gravel	73.9	18.5	7.6	-	-	-	-	2.66
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PROJECT No.:001		CONTRACT No.:001												
PROJECT LOCATION:MADINA		BH OR TP ID: BH-2M												
CLIENT(S): JICA		CONTRACTOR (S):												
CONSULTANT(S): INNOVATIVE SOLUTIONS CONSULTANCY (ISC) SL														
Test ref.AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)														
LIMITED														
TEST: Summary of Lab tests results														
Depths (m)	Atterberg Limits Test			USCS	SOIL DESCRIPTION	Shear Box Test	Particle size distribution	Consolidation Test	Specific gravity of soil solids (Gs)					
	Natural Moisture Content (%)	LL (%)	PL (%)							PI	Fricition angle (φ) deg.	Cohesion (c) (kN/m ²)	SAND (%)	GRAVEL (%)
0.05-4.0	-	-	-	-	Moderately weathered Lateritic rock (Gabbroic rock)									
4.0-5.0	19.7	28.8	13.9	14.9	GC	Clayey gravel with sand	23.3	53.9	22.8	37	10.05	-	-	2.29

GEOTECHNICAL REPORT FOR THE PROPOSED CONSTRUCTION OF EDISA SUBSTATION AT MADINA

5.0-6.0	25.9	26.9	14.4	12.5	GC	Clayey gravel with sand	18.1	57.1	24.8	-	-	-	-	2.58
6.0-7.0	24.9	31.8	15.5	16.3	SC	Clayey sand with gravel	51.3	26.8	21.9	33	13.66	-	-	2.33
7.0-8.0	26.9	29.6	13.2	16.4	SC	Clayey sand	62.4	14.3	23.3	-	-	-	-	2.18
8.0-9.0	31.7	32.7	14.2	18.5	CL	Sandy lean clay	40.5	6.6	52.9	28	33.9	0.00091	0.2043	2.69
9.0-10.0	28.9	36.4	17.6	18.8	CL	Sandy lean clay	33.0	9.4	57.6	-	-	0.00096	0.2376	2.71
10.0-11.0	26.7	22.1	16.4	5.7	SP-SC	Poorly graded sand with clay	78.6	10.7	10.7	-	-	-	-	2.56
11.0-12.0	30.6	23.1	18.7	4.4	SP-SC	Poorly graded sand with clay	82.9	8.7	8.4	-	-	-	-	2.42
12.0-13.0	32.1	NP	NP	NP	SP	Poorly graded sand	83.3	13.1	3.6	-	-	-	-	2.49
14.0-14.0	31.7	NP	NP	NP	SP	Poorly graded sand	87.8	9.5	2.7	-	-	-	-	2.38

A11-102

14.0-15.0	36.9	NP	NP	NP	NP	NP	NP	NP	NP	NP	NP	Poorly graded sand	86.7	8.5	4.8	-	-	-	2.44
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The table below contains summarized Tri-axial Unconsolidated Undrained (UU) laboratory test results as an excerpt from the data sheets.

Borehole ID	Depth (m)	Cell pressure, σ_3 (kg/cm ²)	Strain rate (%/min)	Deviatory Stress σ_1 (kg/cm ²)	Undrained Shear strength C_{ult} (kg/cm ²)	Deviatory stress at failure $\Delta\sigma$ (kg/cm ²)	Asial Strain at Failure ϵ (%)
BH-1M	6.0	0.76	1	2.28	0.76	1.52	7.0
BH-2M	9.0	0.89	1	2.43	0.77	1.54	7.5
	10.0	1.06	1	2.54	0.74	1.48	8.9

Failure Criterion: Maximum deviatory stress

Appendix XI: Site Photos



Figure 3: Madina BH-1 Machine Setup



Figure 4: Madina BH-1 Drilling Process



Figure 5: Madina BH-1 Rock Coring Process



Figure 6: Madina BH-1 Cored Rock Sample



Figure 7: Madina BH-1 SPT Blow Counts



Figure 8: Madina BH-1 Rock Samples



Figure 9: Madina BH-1 SPT Sample @ 6.0m.



Figure 10: Madina BH-1 SPT Sample @7.0m



Figure 11: Madina BH-1 SPT Sample @8.0m



Figure 12: Madina BH-1 SPT Sample @ 9.0m



Figure 13: Madina BH-1 SPT Sample @ 10.0m



Figure 14: Madina BH-1 SPT Completed



Figure 15: Madina BH-2 Machine Setup



Figure 17: Madina BH-2 Rock Coring



Figure 16: Madina BH-2 Drilling Process



Figure 18: Madina BH-2 Rock Cored



Figure 19: Madina BH-2 Rock Samples



Figure 21: Madina BH-2 SPT Sample @ 6.0m



Figure 20: Madina BH-2 SPT Sample @ 5.0m



Figure 22: Madina BH-2 SPT Sample @ 7.0m



Figure 23: Madina BH-2 SPT Sample @ 8.0m



Figure 24: Madina BH-2 SPT Sample @ 9.0m



Figure 25: Madina BH-2 SPT Sample @ 10.0m



Figure 26: Madina BH-2 SPT Sample @ 11.0m



Figure 27: Madina BH-2 SPT Sample @ 12.0m



Figure 28: Madina BH-2 SPT Sample @ 15.0m



Figure 29: Madina BH-2 SPT Blow Counts



Figure 30: Madina BH-2 SPT Completed



Figure 31: Madina Trial Pit-1 @ 0.65m



Figure 32: Madina Trial Pit-2 @ 0.5m



Figure 33: Reference Cross-Section Pit 1



Figure 34: Reference Cross-Section Pit 2

Appendix XII: Laboratory Test Photos



Figure 35: Delivered Soil Samples at the Laboratory



Figure 36: Drying of Soil Samples



Figure 37: Weighing Scale



Figure 38: Weighing of Empty Cans



Figure 39: Weighing of Moist Soil



Figure 40: Placement of Samples in the oven for drying



Figure 41: Oven drying of Soil Samples



Figure 42: Sequential Arrangement of Sieves



Figure 43: Performing Sieve Analysis



Figure 44: Weighing of Retained Soil Sample



Figure 45: Atterberg Limit Test Equipments Setup



Figure 46: Performing Liquid Limit Test



Figure 47: Separated Groove



Figure 48: Performing Plastic Limit Test



Figure 49: Weighing of Empty Can



Figure 50: Weighing Liquid Limit Test Sample



Figure 51: Direct Shear Box Equipment



Figure 52: Performing Direct Shear Box Test



Figure 53: Direct Shear Box Tested Sample



Figure 54: Unconfined Compression Test Equipment



Figure 55: Compressive Test on Rock Sample



Figure 56: Tri-axial Test Equipment

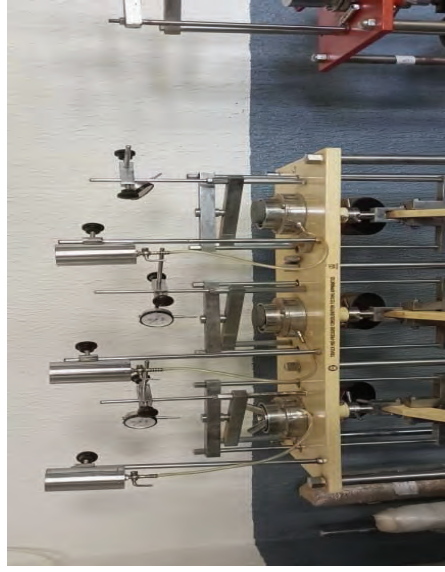


Figure 57: 1D Consolidation Test Equipment



Figure 58: Performing Specific Gravity Test

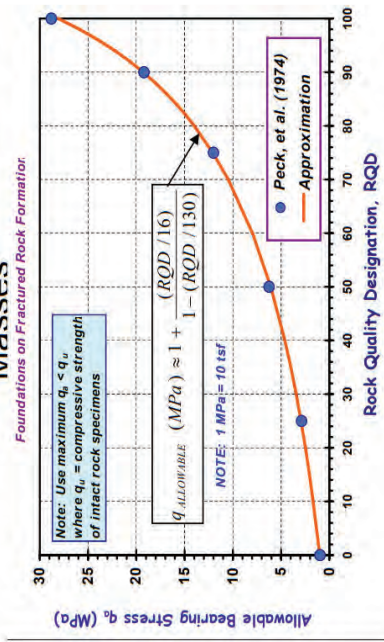
Appendix XIII: References

Laboratory Attachment of the Testing Institution, Test Period, Tester Name, Confirmed Qualified Person Name And Their Signatures.

	
Test Institution	Fourah Bay College (F.B.C) Ing. Momoh Missisquoi Chief Laboratory Officer Contact: +2322769057541 Signature:  Ing. Foday Bangura Contact: +23277333763 Signature:  Dr. Abdul A. Koroma (Head of Civil Engineering Department F.B.C) Contact: +23279331141 Signature: 
Tested by	
Confirmed by	
Test duration	Tombor: 16-12-2021 to 27-12-2021 Work: 18-12-2021 to 30-12-2021



Allowable Bearing Stresses on Rock Masses



Correlation with soil mechanical properties [61]

Despite its many flaws, it is usual practice to correlate SPT results with soil properties relevant for geotechnical engineering design. SPT results are in situ field measurements, and not as subject to sample disturbance, and are often the only test results available, therefore the use of correlations has become common practice in many countries. An approximate relationship cited in the US Army Corp of Engineers engineering manual publication on steel pile design developed after Terzaghi and Peck (1948) and Teng (1962), shows in the table below the relationship (specifically for SPT N values and bulk density of soil) correlated to relative density and referred to in the engineering manual as moist unit weight in per units, converted to metric values in the table [61]

Relative Density	SPT N value	Bulk Density (g/cm ³)
Very loose	0 - 4	< 1.600
Loose	5 - 10	1.500 - 2.000
Medium	11 - 30	1.750 - 2.100
Dense	31 - 50	1.750 - 2.245
Very Dense	> 50	> 2.100

12. EIA Screening Result

12. EIA Screening Result

08 DEC 2021



GOVERNMENT OF SIERRA LEONE
Environment Protection Agency
Ministry of the Environment
92 Dundas Street, Freetown



Ref: EPA-SL/HA/414/421/01/DDPPR

7th December 2021

The Director-General
Electricity Distribution & Supply
5a High Broad Street
Murray Town.
Freetown.

Dear Sir,

RE: SUBMISSION OF APPLICATION AND SCREENING FORMS, PROJECT EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULAR PROJECT (JICA-EDSA PROJECT)

I am directed to refer to the above subject matter and write to inform you that after a careful review of the completed screening form for the Extension of Power Distribution System along the Freetown Peninsular Project, the Agency has categorized your project as a category **B project**; therefore, you are required to carry out an Environmental, Social and Health Impact Assessment (ESHIA) study within the project locations and its environs.

I wish to draw your attention to Section 23 of the EPA Act 2008, as amended in 2010, which states that *"no person shall undertake or cause to be undertaken any of the projects set out in the First Schedule unless he holds a valid license in respect of such project."*

In light of the above, you are required to prepare a scoping report including Terms of Reference for the study to be submitted to the Office of the Executive Chairperson before the commencement of the Environmental Social, Health Impact Assessment (ESHIA) studies.

The Agency further informed you that the Agency only accept and review environmental impact assessment study carried out by a certified consultancy firm. Attached is a list of registered and accredited firms.

We look forward to your continued cooperation.

Yours sincerely,

Mobashir G Idriss
For Executive Chairman

Cc: Executive Chairman
Director, EPA-SL
Deputy Director, Policy Planning and Research, EPA-SL
Deputy Director, Compliance Enforcement & Legal Affairs, EPA-SL



GOVERNMENT OF SIERRA LEONE
Environment Protection Agency
Ministry of the Environment
92 Dundas Street, Freetown



LIST OF FULL PAYMENT AND CATEGORIES

N O	NAME	CATEGORIES	FULL PAYME NT	ADDRESS	EMAIL
1	GLOBAL INITIATIVE	A	✓	7E BENKA LANE, OFF WILKINSON ROAD	
2	CEMMATS GROUPS LTED	A	✓	7A CANTONMENT ROAD, OFF KINGHARMAN ROAD, BROOKFIELDS FREETOWN	
3	TROPICAL ENVIRONMENTAL DESIGN (TEDA)	A	✓	63 Wellington Street, Freetown	
4	GEO-MINING CONSULTANCY SL LTD	A	✓	33 VICTORIA STREET	
5	ECO-WORLD SL LTD	B	✓	29 BIG WATERLOO STREET, FREETOWN	

6	KEYEBUNT GEOSCIENCE & MANAGEMENT SOLUTIONS LTD	B	✓	12F OLD R4AILWY LINE TENGBEH TOWN
7	MAKONA ENVIRONMENT AL TECHNICIANS	B	✓	68 KELSEY ROAD, KISSY DOCK YARD, FREETOWN
8	NJALA ENVIRONMENT AL CONSULTANTS	B	✓	NJALA UNIVERSITY, HENRY STREET, FREETOWN
9	KENCO ENVIRONMENT AL SL LTD	B	✓	69 KING GEORGE AVE, FREETOWN
10	B2K	C	✓	39 MAIN ROAD, LIECESTER VILLAGE, FREETOWN
11	DALAN DEVELOPMENT CONSULTANTS	C	✓	12A KING STREET, THE MAZE, WILBERFORC E, FREETOWN
12	GREEN VITAL ENVIRONMENT AL CONSULTANCY	C	✓	7A HALL STREET BROOKFEILD S, FREETOWN
13	INTERNATIONAL CONSULTING SERVICES	C	✓	28 BATHRUST STREET

14	CIVIL & ENVIRONMENT AL CONSULTANCY SL	C	HALF PAYME NT	34 GODERICH STREET, FREETOWN	
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**13. Commitment Letter regarding Obtaining
the EIA License**

13. Commitment Letter regarding Obtaining the EIA License



HEAD OFFICE
Electricity House
36 Siaka Stevens Street, Freetown
Republic of Sierra Leone, West Africa

Electricity Distribution and Supply Authority

EDSA-JICA-022-05386

29th July 2022

Honorable Hitoshi Sato
JICA Sierra Leone Office,
17a Gwent Height, Hill Cot Road,
Freetown, Sierra Leone

Subject: Commitment letter regarding obtaining the EIA license

Dear Honorable Sato,

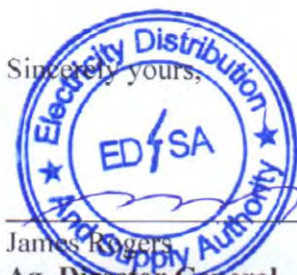
We wish to extend our warmest thanks to JICA and the people of Japan for their continuing support of EDSA.

Unfortunately, we once again find that it is difficult to obtain the EIA license by the end of July.

With respect to this project, the Company has substantially completed the confirmation of the contents of the environmental license with the EPA, and the license is ready to be issued once the license fee is paid by the Ministry of Finance.

EDSA will remind the Ministry of Finance to pay the license fee so that the license will be issued by the end of October 2022. JICA will be informed when it is obtained.

Sincerely yours,



James Rogers
Ag. Director General,
Electricity Distribution and Supply Authority (EDSA)

Kana [Signature]
for Hitoshi Sato



- CC: The Hon. Minister of Energy- MoE
The Hon. Deputy Minister of Energy – MoE
The Permanent secretary of Energy - MoE
The Chairman Board of Directors – EDSA
The Ag Deputy Director General – EDSA
The Chief Finance Officer - EDSA
The Director of Distribution technical Services - EDSA

14. Environmental and Social Consideration
Survey Report

ESHIA

For the Project of Extension of Power Distribution System along the Freetown Peninsula in the Republic of Sierra Leone



14. Environmental and Social Consideration Survey Report (ESHIA)

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Acronyms and Abbreviation

AIDS	Acquired Immune Deficiency Syndrome
APC	All People's Congress
BOD	Biochemical Oxygen Demand
CHC	Community Health Centre
DHMT	District Health Management Team
DO	Dissolved oxygen
DOE	Department of the Environment
DTR	Distribution Transformers
EAP	Energy Access Project
EC	Electrical Conductivity
ECOWAS	Economic Community of West African States
ECREEE	ECOWAS Centre for Renewable Energy and Energy Efficiency
EDSA	Electricity Distribution and Supply Authority
EGTC	Electricity Generation and Transmission Company
EHSGs	Environmental Health and Safety Guidelines
EIA	Environmental Impact Assessment
EPA	Environmental Protection Agency
EPC	Engineering, Procurement and Construction
ESC	Environmental and Social Consideration
ESF	Environmental and Social Framework
ESHIA	Environmental, Social and Health Impact Assessment
ESIA	Environmental Social Impact Assessment
ESMP	Environmental and Social Management Plan
ESS	Environmental and Social Standard
ESURP	Energy Sector Utility Reform Project
EWRC	Electricity and Water Regulatory Commission
FGD	Focus Group Discussions
FQSE	Free Quality School Education
GBV	Gender-Based Violence
GIIP	Good International Industry Practice
GIS	Geographic Information System
GoSL	Government of Sierra Leone
GPS	Global Positioning System
GRM	Grievance Redress Committee

GST	Government Sales Tax
HCB	Hexachlorobenzene
HIV	Human Immune Virus
IAEA	International Atomic Energy Agency
IBA	Important Bird Areas
IDP	Internally Displaced Person
IFC	International Finance Corporation
IPP	Independent Power Producers
ISO	International Organization of Standards
ITF	Inter-Tropical Front
IUCN	International Union for Conservation of Nature
JICA	Japan International Cooperation Agency
JSS	Junior Secondary School
km	Kilometre
L&FS	Life and Fire Safety
LRP	Livelihood Restoration Plan
LVDB	Low Voltage Distribution Board
MDAs	Ministries Departments and Agencies
mg	Milligram
mg/L	Milligram per Litre
MoE	Ministry of Energy
NaCEF	National Commission for Environment and Forestry
NEAP	National Environmental Action Plan
NEP	National Environmental Policy
NGOs	Non-Governmental Organizations
NPAA	National Protected Area Authority
NSRPA	Nuclear Safety and Radiation Protection Authority
NTU	Nephelometric Turbidity Units
NWRMA	National Water Resources Management Agency
OHS	Occupational Health and Safety
PCBs	Polychlorinated Biphenyls
PM	Particulate Matter
POPs	Persistent Organic Pollutants
ppb	Parts Per Billion
PPE	Personal Protective Equipment
RoW	Right-of-Way
RTD	Real Time Data
SDGs	Sustainable Development Goals
SLDHS	Sierra Leone Demographic and Health Survey
SLPP	Sierra Leone People's Party

SLRA
SSS
TAN
TDS
ToR

Sierra Leone Roads Authority
Senior Secondary School
Total Ammonia Nitrogen
Total Dissolved Solids
Terms of Reference

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Mohapewa Co. Ltd is very much thankful to Yachiyo Engineering Co. Ltd (YEC) for the trust and confidence placed on the firm to conduct the Environmental and Social Impact Assessment (ESIA) study for the proposed power extension project along the Peninsula.

We wish to extend our most profound appreciation to the various government ministries, departments, agencies, institutions, organisations, and individuals whose immense contributions, either directly or indirectly, made the ESIA study possible. We gratefully acknowledge the cooperation and support provided to us by the Environment Protection Agency Sierra Leone (EPA-SL), Japan International Cooperation Agency (JICA) and the Electricity Distribution and Supply Authority (EDSA) to carry out this study successfully.

We are delighted to also express our sincere gratitude to the local authorities and the residents of the different communities that we visited along the Peninsula in the Western Area Rural District for their tremendous support during the study.

More importantly, we would also like to thank all staff of Mohapewa and all other persons who contributed to a successful ESIA study in several ways.

EXECUTIVE SUMMARY

Project Overview

Through the Electricity Distribution and Supply Authority (EDSA), the Government of Sierra Leone (GoSL) is applying for a loan from Japan International Cooperation Agency (JICA) to finance the Extension of Power Distribution System along the Freetown Peninsula. The proposed Project runs from the Goderich substation through Sussex, Tokeh, York, Tombo to Kerry Town.

As part of the Project's preparation, EDSA is required to undertake and complete an Environmental Social and Health Impact Assessment (ESHIA) in accordance with the EPA Act (2008) as amended in 2010 of Sierra Leone, JICA Environmental and Social Considerations of 2010 (JICA Guidelines) and the World Bank Group Environmental and Social Standards (ESS). With this background, the development of ESIA has been commissioned to be prepared and disclosed to project stakeholders.

The following are objectives of the ESHIA study:

- To Detail Statutory Provisions and policies relevant to the Project;
- To assess the impact of transmission and Distribution Network along the Project footprint;
- To identify the significant potential positive and negative impacts of project activities;
- To suggest Environmental Management Plan (EMP) that integrates mitigation measures in project management;
- To conduct stakeholder engagement and consultation meetings and integrate their opinions;
- To establish the site-specific biophysical, health status and socio-economic baseline conditions of the Project area i.e. receiving environment;
- To incorporate the recommendations of the Environmental and Social Health Impact Assessment (ESHIA) process into detailed Project design and decisions;
- To submit and present the ESHIA for review by the client and thereafter integrate the concerns as required.

Project Components

The Project activities will involve the following:

No	Components	Quantities
Procurement and Installation Work		
1	Construction of 33kV line (Goderich SS to Tombo SS) (a) 33kV overhead line	Approx. 46km
2	Construction of 11kV line (Sussex to Medical Hospital at Kerry Town) (a) 11kV overhead line	Approx. 52km
3	Construction of 33/11kV Primary substation (a) 1x 15MVA 33/11kV Tombo substation (b) 1x 15MVA 33/11kV York substation	1 lot 1 lot
4	Construction of 11/0.4kV Secondary substation (a) 100kVA Pole-mount type (b) 250kVA Pole-mount type (c) 2x250kVA Pole-mount type (d) 315kVA Ground-mount type (e) 630kVA Ground-mount type	28 locations 6 lot 11 lot 5 lot 4 lot 2 lot
Procurement Work		
5	Low voltage facilities (poles, conductors, cables, insulators, power meters)	1 lot
6	Maintenance Tools	1 lot
7	Spare Parts and Consumables	1 lot
8	Rock-breaker ¹	1 set
Construction Work		
9	Construction of buildings for substation	2 buildings
10	Civil works	1 lot

Feasible and Reasonable Project Alternatives

Selecting a "No – Project" alternative would mean cancelling the proposed project. Many benefits from the Project are expected to outweigh the project's minor environmental impacts, such as providing a consistent electricity supply to consumers and developmental and socio-economic benefits. As a result, the no-project option is not an environmental or social necessity.

Steel tubular poles would be used for the distribution lines as against wooden poles. Steel tubular poles are corrosion resistant, immune to insect infestation and rot and fireproof, while the 2 primary substations shall be a smart grid.

The distribution line shall be constructed on the Right-of-Way (RoW), a piece of land reserved for utilities.

Legal Framework

The policy, legal and institutional frameworks governing development projects usually provide guidelines to protect the environment, livelihood, well-being of workers and residents, and sustainable development. The policy and legal provisions are found in various national policies and legal documents. International policies on environmental management include the JICA Guidelines for Environmental and Social Considerations, the World Bank guidelines on environmental health and safety and the World Bank Environmental and Social Standards (ESSs), which form part of the World Bank's 2016 Environmental and Social Framework (ESF). These include essential guidelines for this Project.

The following policies, legal instruments, Relevant Multilateral Environmental Agreements (MEAS), World Bank Environmental Safeguards policies and other international conventions to which Sierra Leone has signed up to are detailed in this report:

- The Constitution of Sierra Leone 1991;
- Environment Protection Agency Act 2008 as amended in 2010;
- National Electricity Act of 2011;
- Factories Act, 1988;
- The Forestry Regulations, 1989
- Wildlife Conservation Amendment Act, 1990
- Sierra Leone Roads Authority (Amendment) Act of 2010;
- The Factories Act, 1974;
- Public Order Act, 1965;
- The Local Government Act, 2004
- The Sierra Leone Road Safety Authority Act 1996 (amended 2016)
- Sierra Leone National Land Policy 2015;
- The National Environmental Policy (NEP) 1994;
- The National Forestry Policy, 2010
- National Policy for Development-Induced Resettlement, 2021
- The Stockholm Convention on Persistent Organic Pollutants (POPs)
- World Bank (WB) Guidelines: Environmental, Health, and Safety Guidelines, General EHS Guidelines, 2007
- World Bank Environmental, Health, And Safety Guidelines for Electric Power

Transmission and Distribution

- JICA Environmental and Social Consideration 2010
- World Bank Environmental and Social Standards (ESSs)

Institutional Framework

The following institutions are responsible for this Project:

- The Ministry of Energy (MoE)
- The Ministry of the Environment
- Electricity Generation and Transmission Company (EGTC)
- The Electricity Distribution and Supply Authority (EDSA)
- The Electricity and Water Regulatory Commission
- Nuclear Safety and Radiation Protection Authority
- Environment Protection Agency - Sierra Leone (EPA-SL)
- The Sierra Leone Roads Authority (SLRA)

Environmental Baseline

The environmental baseline data collection focuses on the information required to assess the Project area's environmental impact.

The WARD geography is defined by the narrow and nearly parallel Ranges of highlands running through the heart of the Freetown Peninsula and the low-lying Koya plains at the foot of the forest-covered mountain ranges (Cline-Cole,1987). The rising mountain ranges from the shore influence the region's weather and climate patterns

Much of the land in the WARD is either privately owned in freehold tenure or controlled by the government as land banks, forest reserves for potential national development projects. One of the principal uses of land at the foot of the ridges around WARD is for housing development. Goderich to Sussex is highly built-up following the end of the war in 2002. The built-up areas are predominantly influenced by the high demand for housing given the growth in population and the Tokeh Peninsular Road that has been in construction since 2000. Towards the coastal areas of this zone, low-lying areas are used to cultivate vegetables. Beyond Sussex village, are low-density residential areas. The forest covering the high ridges is used for local communities' charcoal burning, woodcutting, and medicinal purposes.

Freetown Peninsula experiences some of the heaviest rainfall in the country with annual rainfall ranging from 3000-7000mm (Birchall et al., 1979). Mean daily

temperatures vary between 25-30°C in the dry season and 22-27°C in the rainy season. Relative humidity at 1500 hours varies between 45% and 80% annually.

The general climate and vegetation of Sierra Leone are primarily dependent on the biogeography location of the country in west tropical Africa.

Ecology

The general view of the Project landscape is that of a mosaic of various states of vegetation and the components that influence the ecology. Much of the mosaic is human settlement surrounded by multiple degrees of vegetation degradation and regrowth, under different regimes of human influence such as agriculture, housing construction, and settlement expansion.

A total of 9 species of mammals was recorded through interviews, signs and, visual evidence across the three axes visited along the peninsular road corridor. Most of the mammal species recorded by visual evidence or interviews are presumed to be in the decline in terms of their occurrence within the 500 m range on either side of the peninsula road corridor.

99 species of birds belonging to 44 avian families were recorded across the three axes of the seventy sites surveyed.

The herpetofauna recorded in the survey corridor comprises common species. No globally threatened species of reptiles or amphibians were recorded. The number of amphibians recorded was five (5), and the low diversity is associated with the dry nature of the environment at the time and season of the survey. The most common species in the count was the African Common Frog *Sclerophrys regularis*, which had a widespread distribution and was found in almost all streams and associated habitats throughout the survey corridor. The other species recorded are as follows: Broad-banded Grass Frog *Ptychoadena bibroni*, Sharp-nosed frog *Ptychoadena oxyrhynchus* African Grove-crowned Frog, *Hoplobatrachus occipitalis* and *Ahl's River Frog* *Phrynobatrachus latifrons*

The number of reptile species recorded was nine (9).

Noise

Noise levels and their impacts vary depending on the time of day, type of community, the age range of recipients, and existing regulations. The noise level is below 80 dB(A) from all locations.

Air Quality

Fourteen (14) sample sites were selected to measure the concentrations of various air quality parameters. The key parameters measured include particulate matter (PM), ozone (O₃), Nitrogen dioxide (NO₂), Sulphur dioxide (SO₂), carbon monoxide (CO), air temperature, and percent relative humidity. Concentrations were measured every minute for 30 minutes in the morning, afternoon, and night. These were computed into daily averages per site.

For both the PM_{2.5} and PM₁₀, the daily averages exceeded the WHO recommended standards for all the sites. This implies that any additional emissions of PM_{2.5} and PM₁₀ may significantly impact people and ecosystems in the area.

For daily averages of Ozone, all the values are well below the recommended threshold for maximum contaminant level.

The WHO recommended standard for Sulphur dioxide is 40 µg/m³ as a daily average. The background concentrations are already far above the daily recommended average. This means that additional emission sources may pose a significant threat to people's health and ecosystems.

Water Quality

Most of the pH values are below the recommended threshold of 6.0 even though Sierra Leone waters are slightly acidic. Three of the sample sites showed Turbidity readings above the WHO recommended value of 5 NTU. The rest of the parameters show benign concentrations according to their respective recommended guideline values.

Socio-Economic Baseline of The Project Area

A total of 35 Settlements Adonkia (including SLBC drive, Battalion, Metschem Angola town, New Jersey, Emergency and Bango Farm), Mile 13, Tombo, Big Water, PWD Compound, Mama Beach, Kossoh Middle Town, Number 2 River, York, Kerry Town, Mambo, Samuel During, John Obey, Macdonald, Black Johnson, Ogoo Farm, Russel, Boyor, Madina, Hamilton, Kissy Town, Baw Baw, George, Tokeh, Lakka, Sussex, and Kent were covered in the study, which includes all the settlements located within the Project area.

Five hundred and eighty-nine (589) household questionnaires were administered randomly to sampled household heads by trained enumerators in Krio Language.

Main Findings of Socio-economic baseline survey

Characteristic	Finding (%)	Comment
Education and Labour Profile		
The percentage of household heads with no formal education	24.8	This includes Household heads that have never been to school and those who acquired Arabic education.
The percentage of household heads with secondary education	33.5	An appreciable percentage of household heads have acquired secondary education.
The percentage of household heads attained at least tertiary education or admitted into a tertiary educational system	15.3	There is a low proportion of higher educational attainment among communities in the project area.
The percentage of primary school enrolment of children aged 6-13 years in households	97.4	High rate of primary enrolment of children aged 6-13 years in communities in the project area.
The percentage of secondary school children who drop out	12.8	Significant drop out rate of secondary school children. The non-affordability of school material, to assist in trading or other income generation for household, and unwanted and early pregnancy are the top three reasons for drop out.
Livelihood and Economic Profile		
The main occupation of household heads		
Trading	41.3	The dominant economic activities in the project area are trading and fishing. There is a low unemployment rate among household heads in the project area.
Fishing	10.9	
Self-employed	19.2	
Unemployed	6.4	
Health and Safety		
Disease prevalence		
Malaria	48.8	The prevalent diseases in the project area are Malaria and Cold/Cough/Flu.
Cold/Cough/Flu	26.3	

Availability of treatment facilities in communities	87	There are adequate treatment facilities within the project area, including hospitals and community health posts/centres.
Water, Sanitation, and Waste Management		
Drinking water sources		
Pipe-borne water	42.7	Pipe borne water and protected well are the primary drinking water sources for households in the project area. Households reported that the quality of water is good. There is easy access to portable water as most households reported water sources are available in their compound or neighbouring compound.
Protected well	25.4	
Solid Waste Disposal		
Burning	39.1	The typical waste disposal means in the project area is Burring.
Throw in bush	26.9	
Waste disposal company	22.4	
Type of toilet facility		
Traditional pit latrine	34.9	Traditional pit latrines and flushes are the typical toilet facility in the project area.
Ventilated pit latrine	19.6	
Flush	30.8	
Energy for cooking and Lighting		
Energy for cooking		
Wood	37	Charcoal is the typical energy source for cooking among households surveyed in the project area.
Charcoal	56	
Energy for lighting		
EDSA	27.6	Only 1/4 of households in the project area in communities such as Battalion, Adonkia, Emergency, Ogoo farm
Private solar	21.4	
Generator	10.9	

Flashlight/Chinese light	39.5	Lakka, Hamilton, Mambo, Mile 13, and Sussex are connected to the government electricity grid, which is efficient and affordable.
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Stakeholder Participation

Consultations for this ESIA are consistent with provisions in the ESS10.

The following are the stakeholder composition:

- Member of Parliament
- Councilor
- Headman
- Deputy Headman
- Chairlady/Women's leader
- Youth leader
- Ward/Community Secretary
- Tribal chief

Proposed Project Impacts and Benefits Enhancement

Impact	Phase of Concern	Duration	Extent	Magnitude	Likelihood
Loss of Land, Assets and Livelihood	Construction	Long term	Local	Minor	Likely
Loss of Vegetation	Construction	Long term	Local	Minor	Likely
Soil Contamination and Erosion	Construction	Short term	Local	Minor	Likely
Water Contamination	Construction, Operation & Closure	Short term	Regional	Major	Likely
Solid Waste	Construction, Operation & Closure	Short term	Local	Major	Very Likely
Hazardous waste	Construction & Operation	Short term	Local	Major	Very Likely
Impact on Air Quality	Construction and Closure	Short term	Regional	Major	Very Likely
Impact on Noise and Vibration	Construction and Closure	Short term	Local	Major	Very Likely
Labour and Occupational Health and Safety (OHS)	Construction and Operation	Short term	Local	Major	Very Likely
Community Health and Safety	Construction	Short term	Local	Major	Very Likely
Impact on Cultural/Archaeological Resources	Construction	Short term	Local	Major	Unlikely
Concerns related to the Influx of Population	Construction	Short term	Local	Minor	Likely
Fire Hazard	Operation	Short term	Local	Major	Likely

SECTION 1: INTRODUCTION

1.1 Background

Through the Electricity Distribution and Supply Authority (EDSA), the Government of Sierra Leone (GoSL) is applying for a loan from the Japan International Cooperation Agency (JICA) to finance the Project of Extension of Power Distribution System along the Freetown Peninsula. The proposed Project supports the government sector strategy and builds on the just concluded and ongoing World Bank's energy projects like Energy Access Project (EAP) and the Energy Sector Utility Reform Project (ESURP), all aimed at achieving a sustainable power sector. The Project's main aim is to expand and stabilise the power supply in the southwest part of the Freetown Peninsula from Goderich to Kerry Town via Sussex, Tokeh, York, Kent, Tombo etc. communities by constructing two new primary substations, secondary substations and transmission/distribution network to contribute to the reduction of poverty, the stability of society and the establishment of peace. These areas are rapidly developing and have great touristic potential and revenue generation. The Project, when completed, will enhance the capacity of the distribution network to take and distribute additional electricity to underserved communities and businesses in the Peninsula area of Freetown. This will also improve the financial and technical performance of EDSA.

As part of the Project preparation, EDSA is required to prepare Environmental, Social and Health Impact Assessment (ESHIA) in accordance with the EPA Act (2008) as amended in 2010 of Sierra Leone, JICA Guidelines for Environmental and Social Considerations of 2010 (JICA Guidelines) and the World Bank Group Environmental and Social Standards (ESS).

In Part IV, Section 23 subsection 1, of the EPA Act (2008), projects in First Schedule (with major impacts) require undertaking ESIA and get a permit to commence works and operations. The Project was screened and categorised as a 'Category B' Project, therefore, requiring an ESHIA.

1.2 Need for the Project

Sierra Leone ranks among countries with the most erratic and lowest electricity supply to the primary populations. The Bumbuna hydroelectric power plant's main power source has

a 161-kV radial single circuit transmission line with 70 MW. The plant supplies electricity to major cities and towns in the northwest, including Bumbuna, Makeni, Lunsar, Waterloo, and Freetown. Electricity supply efficiency in urban Freetown, which has 17,200 customers (90% of all customers), is about 16%. Only five other district capitals receive intermittent electricity supply from a combination of small diesel units and mini-hydropower plants. As little as 2.5% of the population in rural areas receives electricity supply, even though rural areas account for 57.95% of Sierra Leone's population (World Bank, 2020).

Poor access to electricity has been a significant impediment to long-term economic growth in Sierra Leone. Unfortunately, no country can grow and develop without an adequate electricity supply. Therefore, the Government of Sierra Leone (GoSL) and development partners have prioritised investing in universal access to electricity in the nation. The Government's medium-term national development goals (2019-2023) include:

- increasing electricity generation, transmission, and distribution;
- improving the policy and regulatory environment of the energy sector;
- restoring electricity supply to all district headquarters, towns and cities
- increasing investments in low-cost renewable energy (solar, hydro, wind, and biomass) production and distribution;
- making improvements in governance at all levels of the sector, which includes the Ministry of Energy (MoE), the Electricity Distribution and Supply Authority, the Electricity Generation and Transmission Company (EGTC), and the Electricity and Water Regulatory Commission (EWRC) to develop responsible leadership and institutional culture;
- ensuring the expansion of the transmission grid nationwide by increasing the annual regular kilometer coverage;
- ensuring rural electrification is carried out through engagement and involvement of key stakeholders, including the private sector;
- providing tax incentives as part of a broader commitment to the off-grid sector in the Finance Act, which includes provisions for a duty waiver and Government Sales Tax (GST) extension; and undertaking Multi-Tier Framework surveys to provide data on energy consumption (including mini-grids).

The following are existing projects that are geared towards the achievement of these goals include:

- i. a 6MW plant being constructed at Newton,
- ii. the Bumbuna Phase II project,
- iii. the United States Trade and Development Agency (USTDA) – solar off-grid project,
- iv. the United Nations Office for Project Services (UNOPS) for Rural Renewable Energy Project,
- v. the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) – Solar off-grid project,
- vi. the West African Power Pool (WAPP) Cote D'Ivoire, Liberia, Sierra Leone and Guinea (CLSG) interconnection project,
- vii. Indian Exim Bank – constructing transmission lines and substations from Bumbuna to Freetown.
- viii. JICA, on behalf of the Government of Japan, has executed the following projects:
 - The project for Urgent Improvement of Power Distribution System in Freetown;
 - The project for Urgent Improvement of Power Distribution System in Freetown (Phase 2);
 - The project for Capacity Development for Maintaining Power Supply Facilities.

Currently, the two primary sources of public electricity supply in Sierra Leone are hydroelectric power and fossil fuel combustion. The Bumbuna and Dodo hydroelectric projects are the two primary hydropower sources in the nation. Bumbuna supplies Freetown, Makeni, Bumbuna town, and Lunsar, while Dodo supplies Kenema and Bo. In addition to these sources, EDSA uses thermal plants to provide Freetown, Makeni (Bombali District), Bo, Kenema, and, on a small scale, to a few other cities. The rest of Sierra Leoneans source their electricity privately, with dry cells being the primary energy source and used primarily for lighting. *Error! Reference source not found.* shows the percentage of energy supplied by EDSA and other (mainly battery) sources by the district in Sierra Leone.

Table 1: Percentage of energy use by the district in Sierra Leone

District	Primary Source of Energy for Lighting	
	EDSA (%)	Other sources (battery)
Western Area Urban	81.8	132
Western Area Rural	249	66
Port Loko	11.6	83.6
Kambia	0	81.9
Bombali	25.6	70.7

Tonkolili	1.7	92.7
Koinadugu	0	87.4
Karene	0	96.3
Falaba	0	90.4
Moyamba	0.1	92.4
Bonthe	2.7	94.1
Pujehun	0	83.5
Bo	17.5	71.6
Kenema	15	69.1
Kailahun	0	77.9
Kono	7.8	87.7

At the national level, the three primary sources of non-natural lighting in households are EDSA (19.5%), batteries (71.1%), and solar power (6.6%). Electricity is more prevalent in urban areas (49.3%) than in rural (0.9%); following the same pattern, the battery is more frequently used in rural areas (89.0%) than in urban (42.4%). Other sources of lighting are also more prevalent in rural areas. Solar panel, for example, is used by 8.2% of households in rural areas compared to 3.9% in urban areas. The percentage of households receiving electricity from EDSA increased from 13.5% in 2011 to 19.5% in 2018. In 2011, 52.3% of households used battery power, rising to 71.1% in 2018. These trends indicate the increase in demand for electricity over time. An increasing number of rural communities are adopting assets that require an energy source, while urban communities are increasing the number of electrical appliances per capita.

1.3 Evolution of the Energy Sector in Sierra Leone

Under the National Electricity Act of 2011, the National Power Authority (NPA) was decommissioned and divided into EDSA and EGTC. EDSA assumed the new function of the single buyer to procure power from EGTC, Karpowership (a floating power plant at Kingtom), and other Independent Power Producers (IPP). In the future, EGTC will potentially source power from the West African Power Pool.

To regulate the supply of electricity, to ensure high-quality electricity distribution to citizens in Sierra Leone, the Government developed the Sierra Leone Electricity and Water Regulatory Act of 2011. The Act authorised the establishment of an Electricity and Water Regulatory Commission (EWRC) to regulate the electricity and water sector.

The Commission is empowered to regulate the activities of the energy industry under its Act and the Energy Laws; without limitation to the generality of its mandate, the commission shall carry out the following functions:

- to issue and (as the case may be) renew, amend, suspend, revoke and cancel license;
- to monitor compliance with the terms of licenses
- to establish guidelines for the charging of fees for electricity services to safeguard the interests of electricity consumers and providers to keep track of the performance standards for the provision of electricity
- to initiate and conduct investigations into the quality of services given to consumers
- to promote fair competition among public utilities
- to conduct studies relating to the economy and efficiency of public utilities
- make the valuation of the property of public utilities as it considers necessary for the commission
- to collect and compile data on public utilities as it deems necessary for the performance of its function
- to advise any person or authority in respect of any public utility
- to maintain a register of public utilities and
- to carry out such other activities conducive to the attainment of the power commission's objective.

The Ministry of Energy provides leadership in formulating and implementing the policies, projects, and programs mentioned above. The MoE provides oversight functions for all sector agencies, including EGTC, EDSA, EWRC, and Nuclear Safety and Radiation Protection Authority (NSRPA).

1.4 The Proponent

JICA is financing the proposed development, and it is undertaken jointly with EDSA as the proponent of the Project. EDSA (the proponent) has commissioned this ESHIA study to acquire an Environmental Impact Assessment (EIA) license for the Project implementation. The ESHIA study should outline the existing environmental and social conditions within the proposed Project route and the surrounding communities to identify potential impacts of the Project and the subsequent proposed mitigation measures that EDSA should undertake during its Project construction and operation phases.

During the construction phase, the distribution power Project's activities typically include land clearing for pole spots/locations and substation construction and installation of distribution lines and transformers.

Operational phase activities may include maintaining access to the transmission/distribution lines, poles, transformers, substations, and vegetation management along the transmission/distribution line route. The upgrades and maintenance of the Project infrastructure are considered throughout the Project's life cycle.

Power transmission and distribution facilities are normally decommissioned when obsolete, damaged or replaced due to increased demand. The closure activities may include demolition and removal of the installed infrastructure and reclamation of the Project site, including ground stabilisation and re-vegetation.

EDSA is the sole agency in charge of the country's electricity supply, distribution, and retail sales. This Project must adhere to all applicable national and local legislation at all times, including JICA Guidelines, the World Bank guidelines, Occupational Health and Safety (OHS) procedures to ensure that the environment and the safety of all employees working on this Project is guaranteed.

1.5 Who is Conducting the EIA?

Given that an EIA study for projects grouped under First Schedule of the Environment Protection Agency Act 2008 (Amended 2010), an independent environmental consulting firm must undertake such studies. In that light, Mohapewa Co. Ltd is contracted to undertake this study and prepare an ESHIA report.

Mohapewa Co. Ltd is a Sierra Leone-based company accredited by the Environment Protection Agency (EPA) for undertaking environmental management-related studies. Mohapewa has a strong background and expertise in the environmental assessment for conducting investigations of EIA for development projects within Sierra Leone.

1.6 The ESHIA Process

The EPA has prepared a checklist indicating the processes for obtaining an EIA license. In brief, the steps are:

- Registration: EDSA writes a letter of application to the EPA-SL introducing the Project and requesting a screening form. EPA-SL will then acknowledge the letter with instructions for purchasing the screening form, jointly filed by the consultant and EDSA and submitted to EPA-SL for review.

- **Project Screening:** The EPA-SL reviews the screening form's contents, categorise the Project, and gives the approval to proceed with the study. A ground-truthing visit to the Project site is made during this stage, wherein a team of GIS technicians and environmental officers from EPA-SL visit the site to confirm coordinates/locations provided and determine areas of concern at the locations which may need to be addressed explicitly during the ESHIA study.
- **Scoping:** Following EPA-SL's approval to proceed with the study, a cross-section of the ESHIA team will do a reconnaissance visit to the Project sites to determine the scope of environmental issues and factors to be considered during the main study to prepare guidelines for the conduct of the ESHIA. A scoping report is then compiled based on this assessment, including a Terms of Reference (ToR) for EPA-SL's approval.
- The Environmental and Social Impact Studies and Preparation of the Report: This stage involves data collection, analyses, and reporting of the findings of the ESHIA study. The report will document clearly and impartially the Project's impacts, the proposed measures for mitigation, the significance of effects and effects on the environment, and the concerns of the interested public and the communities affected by the Project.
- **Public Hearing and Review of the ESHIA Report:** EDSA will hold two or more Public Consultation and Disclosure workshops. The final ESHIA will incorporate the conduct of the public consultation and disclosure workshop.
- **Decision Making:** The EPA-SL will review and approve it if satisfied with the report's content. The EIA license is issued on approval following the payment of a license fee contingent on the Project footprint.
- **Compliance and Enforcement:** This stage involves environmental and social monitoring and reporting of Project activities to ensure that they adhere to the license's terms and conditions. EPA-SL requires that quarterly and annual reports are submitted as a prerequisite for the yearly renewal. Monitoring fees are also charged, which is 20% of the license fee.

Figure 1 below summarises the EIA workflow process.

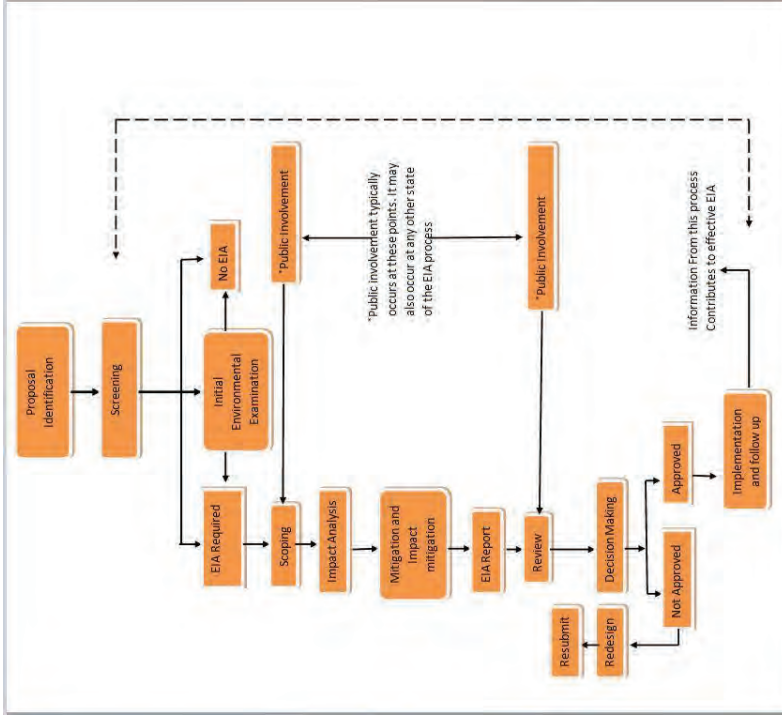


Figure 1: EIA Workflow Process

1.7 ESHIA Methodology

Based on the approved ToR, the methodology used for the study consist of the following:

- Literature review:** Sourced relevant literatures on the policies, guidelines and legislations concerning environmental management. The World Bank and JICA Guidelines related to the proposed Project were also reviewed.
- Field data collection:** Extensive field studies were undertaken by various specialists between January and February 2022 to establish the biophysical and socio-economic baseline of the Project area. Structured questionnaires were administered to source socio-economic data, noise and air quality observations

were made at specific locations, water samples were collected for laboratory analysis and ecological studies were conducted. Locations were mapped using Global Positioning System (GPS) device, and maps were produced using ArcGIS desktop software.

- iii. Stakeholders' consultation: Focus group discussions and key informant interviews were held with traders along the Project route, relevant community authorities and community residents, and the Western Area Rural District Council, etc. to inform them about the Project development proposal and gauge their views about the development.
- iv. Impact Analysis: Evaluate how the various Project activities would impact the biophysical environment and the socio-economic and economic impacts on residents in the Project area and nationally.

1.8 Structure of the Report

The report is structured in nine sections as follows (*Table 2*)

Table 2: Summary of ESHIA Sections

Section	Title	Overview
1	Introduction	Presents the Project background, the proponent, the report's author, Project objectives and methodology
2	Description of Project Activities	A detailed description of the scope of the Project, Project components, and Project boundaries
3	Feasible and Reasonable Alternatives	An analysis of alternatives considered in terms of not undertaking the Project, the technology, design, operations and Project route selection.
4	Review of Policy, Legal and Institutional Framework	A review of laws surrounding environmental protection and best practice in the energy sector
5	Environmental Baseline of the Project Area	The existing physical and biological setting of the Project area.
6	Socio-Economic Baseline of the Project Area	An establishment of the social status of residents in the Project area.
7	Stakeholder Participation	A summary of the stakeholder consultation process and public involvement in the Project

8	Proposed Project Impacts and Benefits Enhancement	Analysis of potential Project impacts and benefit enhancement.
9	Impact Mitigation Measures	Presentation of measures to be followed to mitigate the impacts should they occur or in most cases stop the impact from occurring.
10	Conclusion and Recommendations	Key findings during the survey and recommendations proposed.

SECTION 2: DESCRIPTION OF PROJECT ACTIVITIES

2.1 The Project Location

From the Goderich substation to Kerry Town, the extension of power distribution system travels through Sussex, Tokeh, York, and Tombo. The proposed Project is located in the Western Area Rural District (WARD). WARD is one of Sierra Leone's 16 districts, and it is located in the Western Area, around the Peninsula. It is bordered on the east and west by the capital of Freetown, on the north by Portloko, and on the south and east by the Atlantic Ocean. The government shifted the Rural District capital from Freetown to Waterloo in October 2009. Waterloo is the district's largest and most populous town. Regent, Newton, Benguema, Tombo, and Leicester are all important towns. The Freetown Peninsula is located south of Freetown, with hills and mountains rising to a height of 200 to 1000 metres (656 to 3281 feet) above sea level. It is home to the Western Area Peninsula National Park (WAPNP).

Error! Reference source not found. shows the distribution line route proposed.

Figure 2: Project Location

2.2 Project Components

The project comprises the following components (Table 3):

Table 3: Project Components

No	Components	Quantities
Procurement and Installation Work		
1	Construction of 33kV line (Goderich SS to Tombo SS) (a) 33kV overhead line	Approx. 46km
2	Construction of 11kV line (Sussex to Medical Hospital at Kerry Town) (a) 11kV overhead line	Approx. 52km
3	Construction of 33/11kV Primary substation (a) 1x 15MVA 33/11kV Tombo substation (b) 1x 15MVA 33/11kV York substation	1 lot 1 lot
4	Construction of 11/0.4kV Secondary substation (a) 100kVA Pole-mount type (b) 250kVA Pole-mount type (c) 2x250kVA Pole-mount type (d) 315kVA Ground-mount type (e) 630kVA Ground-mount type	28 locations 6 lot 11 lot 5 lot 4 lot 2 lot
Procurement Work		
5	Low voltage facilities (poles, conductors, cables, insulators, power meters)	1 lot
6	Maintenance Tools	1 lot
7	Spare Parts and Consumables	1 lot
8	Rock-breaker1	1 set
Construction Work		
9	Construction of buildings for substation	2 buildings
10	Civil works	1 lot

NOTE:

Macdonald and Samuel town will be supplied power from Waterloo substation. Note that contents and quantities are subject to change.

This ESIA study will cover the construction of:

- a) Distribution lines, b) Secondary substations, and c) Primary substations

2.2.1 Construction of Distribution Line

The Project shall construct 33kV and 11kV distribution lines along the Project route. Steel tubular poles shall be used. The existing line between Goderich substation and Sussex shall be upgraded, no additional poles shall be placed here. Construction activity of poles shall be done from the Goderich substation to an existing pole at Battalion and from the terminal pole at Sussex to Kerry town.

The Scope of the work for distribution lines involves:

- 33kV Distribution Line between Goderich substation and new Tombo substation. The New York and Tombo substations will be energised by constructing a new 33kV distribution line using a conductor AAC-265mm² overhead line. The support structure of the 33kV overhead distribution line shall be steel pole types.
- 11kV Distribution Line from York substation
- 12 Secondary substations will be energised by constructing a new 11kV distribution line using a conductor AAC-150mm² overhead line. The overhead line length is approximately 35.5km. The support structure of the 11kV overhead distribution line shall be steel pole types.
- 11kV Distribution Line from Tombo substation
- 16 Secondary substations will be energised by constructing a new 11kV distribution line using a conductor AAC-150mm² overhead line. The overhead line length is approximately 12.6km. The support structure of the 11kV overhead distribution line shall be steel pole types.

The design specifications for the 33kV and 11kV distribution lines are shown in **Table 4** and **Table 5** respectively.

Table 4: Specifications for 33 kV Distribution Line

No.	Items	Specifications
1	Power Pole	Type: Steel Pole 15m-850kg Type of pole: Suspension pole Tension pole Safety factor: 1.0 for main body

2	Overhead Line (Conductor)	Type: Aluminium Conductor (AAC) Size: 265mm ²
3	Section Switch	Type: Pole mount, Water single-phase roof
4	Lightning Arrester	Type: Outdoor, single-phase, metal oxide gapless Rated voltage: 36kV Nominal Discharge Current:
5	Insulator	Standards: IEC60383-1 or equivalent Type: Line post insulator Suspension insulator (4 pcs/phase) Material: Porcelain Colour: Brown Creepage distance: Heavy (class d)
6	Ground Wire	Type: Aluminium Clad Steel Wire (AC) Size: 45mm ² Shield Angle: 45 degrees

Table 5: Specifications for 11 kV Distribution Line

No.	Items	Specifications
1	Overhead Line (Conductor)	Type: Steel Pole 15m-850kg, 12m-850kg Type of pole: Suspension pole Tension pole Safety factor: 1.0 for main body 1.2 for arms
2	Overhead Line (Conductor)	Type: Aluminium Conductor (AAC) Size: 150mm ²
3	Section Switch	Type: Pole mount, Waterproof
4	Lightning Arrester	Type: Outdoor, single-phase, metal oxide gapless Rated voltage: 12kV Nominal Discharge Current: 10kA
5	Insulator	Standards: IEC60383-1 or equivalent Type: Line post insulator Suspension insulator (2 pcs/phase) Material: Porcelain Colour: Brown

6	Ground Wire	Type: Size: Shield Angle:	Aluminium Clad Steel Wire (AC) 45mm2 45 degrees
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2.2.2 Construction of Secondary Substations

Twenty-eight (28) secondary substations are proposed to be constructed within the Project area. The equipment in Secondary substations consists of Distribution Transformers (DTR) and Low Voltage Distribution Board (LVDB). The DTR is basically for household loads not industrial and commercial loads. The transformers shall be either pole mounted or ground installed. These transformers shall cover an approximate land space of 2m/2m for pole mount and 4m/4m for ground installations. *Table 6* summarises the secondary substations and how they feed into the primary substation.

Table 6: Summary of Secondary Substations

Substation	No.	Community	Transformer (kVA)	Type or required size (m x m)	Feeder	
York	1	Mammah Beach	315	4 x 4	Kent feeder 1,365 kVA	
	2	Bureh Town	100	Pole mounted		
	3	Kent	250	Pole mounted		
	4	John Obey	2 x 250	Pole mounted		
	5	Black Johnson	100	Pole mounted		
	6	Big Water	100	Pole mounted		
	7	York	2 x 250	Pole mounted		
	8	Tokeh-1	315	4 x 4		
	9	Tokeh-2	315	4 x 4		
	10	Tokeh-3	315	4 x 4		
	11	River No.2	250	Pole mounted		Tokeh feeder 2,195 kVA
12	Baw Baw	2 x 250	Pole mounted			
13	Kerry Town	250	Pole mounted			
14	During Town	100	Pole mounted			
15	Russel Town	100	Pole mounted			
16	Boyor Town	2 x 250	Pole mounted			
17	Madina-1	630	4 x 4			
18	Madina-2	630	4 x 4			
19	Madina-3	2 x 250	Pole mounted			
20	Madina-4	250	Pole mounted	Kerry feeder 950 kVA + Medical Hospital Tombo feeder 2,510 kVA		
21	Tombo-1	250	Pole mounted			
22	Tombo-2	250	Pole mounted			
23	Tombo-3	250	Pole mounted			
24	Tombo-4	250	Pole mounted			
25	Tombo-5	250	Pole mounted			
26	Tombo-6	250	Pole mounted			
27	Kissy Town	250	Pole mounted			
Tombo	1	Mammah Beach	315		4 x 4	Kerry feeder 950 kVA + Medical Hospital Tombo feeder 2,510 kVA
	2	Bureh Town	100		Pole mounted	
	3	Kent	250		Pole mounted	
	4	John Obey	2 x 250	Pole mounted		
	5	Black Johnson	100	Pole mounted		
	6	Big Water	100	Pole mounted		
	7	York	2 x 250	Pole mounted		
	8	Tokeh-1	315	4 x 4		
	9	Tokeh-2	315	4 x 4		
	10	Tokeh-3	315	4 x 4		
	11	River No.2	250	Pole mounted	Tokeh feeder 2,195 kVA	
12	Baw Baw	2 x 250	Pole mounted			
13	Kerry Town	250	Pole mounted			
14	During Town	100	Pole mounted			
15	Russel Town	100	Pole mounted			
16	Boyor Town	2 x 250	Pole mounted			
17	Madina-1	630	4 x 4			
18	Madina-2	630	4 x 4			
19	Madina-3	2 x 250	Pole mounted			
20	Madina-4	250	Pole mounted	Kerry feeder 950 kVA + Medical Hospital Tombo feeder 2,510 kVA		
21	Tombo-1	250	Pole mounted			
22	Tombo-2	250	Pole mounted			
23	Tombo-3	250	Pole mounted			
24	Tombo-4	250	Pole mounted			
25	Tombo-5	250	Pole mounted			
26	Tombo-6	250	Pole mounted			
27	Kissy Town	250	Pole mounted			

28	Brigitte Village	100	Pole mounted
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2.2.3 Construction of Primary Substations

Two primary substations shall be constructed at York and Tombo. The substations shall be equipped with transformers, other ancillary equipment and sanitation facilities. It shall be fenced. Substation layouts are presented in Figure 3 and 4 respectively.

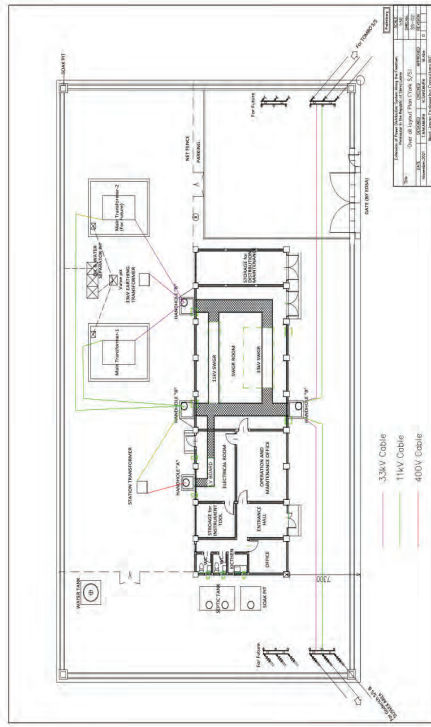


Figure 3: Schematic of the York Primary Substation

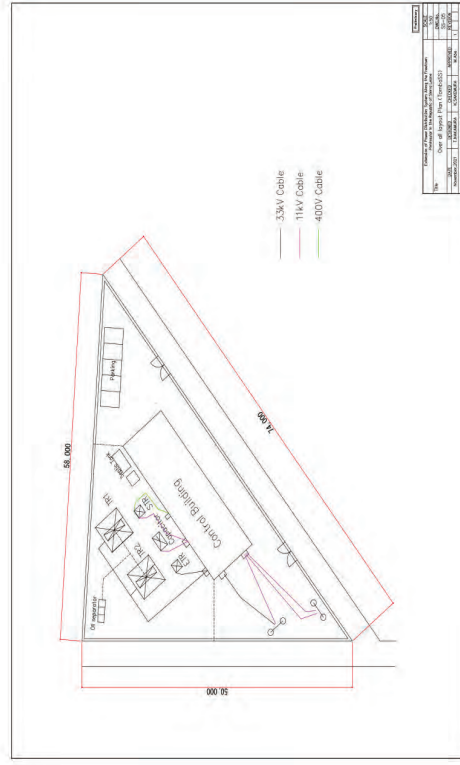


Figure 4: Proposed Tombo Primary Substation Layout

2.3 Project Phases and Activities

It is anticipated that the construction of the distribution line will commence in 2022 and shall last for approximately 18 months. Generally, Project activities are categorised under the following phases:

2.3.1 Phase I: Pre-construction

Several feasibility studies have been commissioned along the proposed route to be used for preliminary engineering designs. These designs will be finalised once detailed studies have been undertaken. All construction activities shall be restricted within the SLRA RoW. EDSA shall make clarifications on the RoW clearance with the SLRA.

Generally, the pre-construction phase involves the following:

- Feasibility studies.
- Line-route studies.
- Environmental, Social and Health Impact Assessment.
- Resettlement and Compensation/Livelihood Restoration Programme (if applicable).
- Front End Engineering Design.
- EPC contract award.
- Mobilisation.
- Check survey of EPC contractor.
- Distribution line and substation detail design.
- Material production (tower members, conductors, insulators, line hardware).
- Material testing.
- Material shipment.

2.3.2 Phase II: Construction Phase

Construction activities will generally follow this sequence as outlined below:

- i. Logistics base
A temporary storage facility will be constructed around the Project site. This facility shall serve as only storage and fabrication, while construction workers will be accommodated elsewhere.

- ii. Clearing of pole spots/ substation
All vegetation within 1m x 1m at pole spots shall be cleared while the entire primary substation sites shall be cleared.

- iii. Foundation Excavation
Foundation shall be dug at specific depths depending on ground conditions. Results of soil conditions will play a key role here. The dug-out soil shall be used for backfilling. Soil will not be imported for backfilling.

- iv. Foundation
Foundation design depends on the terrain and soil type. The formwork and reinforcing rods, embedded parts of the steel pole and any earthing elements will be placed in the pits.

- v. Erection of poles
Poles are erected on the foundation. This can be done manually by assembling prefabricated components of the structure.

- vi. Stringing of cables
This involves 'paying off' conductors and earth wires on the ground and then hoisting them manually at places not accessible and using puller machines or tractors where possible for fixing at both ends of the poles along with insulators and conductors.

Other activities include:

- Substation construction
- Impact mitigation monitoring.
- Commissioning and testing.
- Reinstating and clean-up.
- Demobilisation.
- Handing over.

2.3.3 Phase III: Operations and Maintenance Phase

Once construction works are completed, the infrastructure will be operated by EDSA. JICA shall effectively train engineers who will manage the facility.

At the minimum, the following are undertaken during this phase:

SECTION 3: FEASIBLE AND REASONABLE ALTERNATIVES

This section examines feasible alternatives to the proposed Project site, technology, design, and operation – including the “No - Project” situation- bearing in mind the critical need to protect environmental ecosystems and the core role that the extension of power supply will play in the social and economic development of the WARD and the country at large.

3.1 No - Project Alternative

The selection of a “No - Project” alternative would mean cancelling the proposed Project. This will mean that residents of the Project communities will not realise the Project benefits such as improvement in quality of life, improved community services like health and education, and an improvement in the touristic potential of the Western Area Rural District since there will be stable power supply. Therefore, the ‘No - Project’ option will only worsen the current energy situation in the Project area.

The sites for all the substations are on land either owned by the local communities or the Government of Sierra Leone. The construction of the 33kV, 11kV, Low Voltage distribution lines and substations would address the increased demand for electricity in the Project area in the Freetown Peninsula in the Western Area Rural District.

Also, if the 33kV, 11kV, Low Voltage distribution lines and substations are not constructed, the energy capacity will not increase in the Western Area Rural District. Thus, new communities in the Project area will not be connected to the national grid.

The Project of the Extension of Power Distribution System along the Freetown Peninsula in the Republic of Sierra Leone has identified the need for construction, expansion, and upgrade of the electricity transmission and distribution network based on the length of the lines and the maximum required power transfer. The 33/11kV and 11kV voltage levels were considered based on several technical-economic analysis studies done during Project development for an increase in electricity accessibility and supply in the Freetown Peninsula.

3.2 Alternative Technology

Steel tubular poles would be used for the distribution lines as against wooden poles. Steel tubular poles are corrosion resistant, immune to insect infestation and rot and fireproof. On

- Power distribution.
- Maintenance of distribution line.
- Compliance monitoring.
- Periodic environmental audit.
- Periodic systems audit.

2.3.4 Phase IV: Decommissioning/Closure

This is the terminal stage of the Project. Generally, if a decision is made to decommission the lines, the following steps will be taken:

- Decommissioning Audit.
- Removal of all material from the distribution line.
- Restoration of land to its original situation as much as possible.

the other hand, the 2 primary substations shall be a smart grid. The substations and their facilities shall allow economic efficiency and technical effectiveness over its service life.

3.3 Location/Route Alternatives

The distribution lines shall be constructed on the RoW. The RoW is the parcel of land reserve between the road's edge to the approved offset varying with the road class. This parcel of land is mainly reserved for future development, provides access for other utility companies like EDSA, and provides road users the required safety and level of service. Advantageously, the 2 primary substation sites are owned by the government and the community. The sites for the secondary substations are either government-owned, community or privately owned. Private land owners are willing to donate these portions of land (which requires a small piece of land, 4m X 4m in maximum) for the Project.

Generally, there are a few environmental constraints for the construction and operation of the substations and distribution lines that are described in this report. Supposing the proposed mitigation measures are followed during the implementation (construction and operation phase), there will be no environmental/social objection concerning the site selection of the substations and distribution lines.

SECTION 4: REVIEW OF POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

The policy, legal and institutional frameworks governing development projects usually provide guidelines to ensure the protection of the environment, livelihood, well-being of workers and residents, and sustainable development. The policy and legal provisions are found in various national policies and legal documents. International policies on environmental management include the JICA Guidelines for Environmental and Social Considerations, the World Bank guidelines on environmental health and safety and the World Bank Environmental and Social Standards (ESSs), which form part of the World Bank's 2016 Environmental and Social Framework (ESF). These include essential guidelines for this Project.

4.1 National Legal Framework

4.1.1 The Constitution of Sierra Leone, 1991

Sierra Leone's 1991 Constitution is a set of basic laws and precedents that govern the country. The Executive, Legislature, and Judiciary are the three arms of government, and this constitution comprises fourteen (14) chapters with several parts, sections, and subsections that create the foundation for them.

The 1991 Constitution of Sierra Leone Act No 6 section 21 gives ultimate protection to individual property rights. It categorically states that *"no property of any description shall be compulsorily taken possession of, and no interest in or right over property of any description shall be compulsorily acquired, except where the following conditions are satisfied, that is to say — a. the taking of possession or acquisition is necessary in the interests of defence, public safety, public order, public morality, public health, town and country planning, the development or utilisation of any property in such a manner as to promote the public benefit or the public welfare of citizens of Sierra Leone; and c. provision is made by a law applicable to that taking of possession or acquisition — i. for the prompt payment of adequate compensation; and ii. securing to any person having an interest in or right over the property, a right of access to the court or other impartial and independent authority for the determination of his interest or right, the legality of the taking of possession or acquisition of the property, interest or right, and the amount of any compensation to which he is entitled and for the purpose of obtaining prompt payment of that compensation."*

Therefore, the constitution gives the right to expropriation or compulsory acquisition of private properties for developments/projects that promote the public benefit or the public welfare of citizens of Sierra Leone. However, prompt and adequate compensation should be made in such a situation.

4.1.2 The Sierra Leone Environment Protection Agency Act, 2008/2010

In September 2008, the Act was signed as a formal instrument and later amended in July 2010 to establish the Agency. The EPA is responsible for the effective protection of the environment for long-term development, according to Section 2 subsection 1 of the Act of 2008. The Act requires an EIA report is demanded for certain types of project activities. The assessment contents must be contained in a report that should be submitted to the Executive Director of the Agency. A proponent requesting to carry out an activity that may compromise the benign state of the environment would be mandated to commence its operations by the issuance of an EIA license on approval of a submitted EIA report. The Board may also disapprove of issuing an EIA license if it envisages that the proponent's activities would significantly affect the project area and surrounding communities.

Projects that require an EIA are those that, according to the Act's First Schedule, involve or incorporate the following activities:

- Exploitation of hydraulic resources (e.g. dams, drainage and irrigation projects, water basin development and water supply).
- Infrastructure (e.g. roads, bridges, airports, harbours, transmission lines, pipelines and railways).
- Industrial activities (e.g. metallurgical plants, wood processing plants, chemical plants, power plants, petro-chemical plants and refinery).
- Extractive industries (e.g. mining, quarrying, extraction of sand, gravel, salt, peat, oil and gas).
- Waste management and disposal (e.g. sewage systems and treatment plants, landfills, treatment plants for household and hazardous waste).
- Housing construction and development schemes.

Subject to the Act, regulations are made, as given in section 34, to establish national environmental standards, pertaining to (1) water quality, (2) effluent limitations, (3) air quality, (4) waste, (5) atmospheric protection, (6) Ozone protection, (7) noise control, (8) pesticide residues and (9) odour. It is illegal to bring any globally banned chemicals or compounds into Sierra Leone, as well as to discharge any hazardous or poisonous

substances into the country's air, land, or oceans. If convicted of breaking this regulation, the infringing entity faces a fine, a sentence of imprisonment, or both. The Second Schedule identifies a number of determining factors that necessitate the preparation of a full-blown EIA. These factors include:

- i. The impact on the community
 - ii. The location of the project
 - iii. Whether the project transforms the locality
 - iv. Whether the project has or is likely to have a substantial impact on the ecosystem
 - v. Whether the project results in the diminution of the aesthetic, recreational, scientific, historical, cultural or other environmental quality of the locality
 - vi. Whether the project endangers any species of flora or fauna or the habitat of the flora and fauna of the locality
 - vii. The scale of the project
 - viii. The extent of degradation of the environment
 - ix. Whether the project will result in an increased demand for natural resources in the locality
 - x. The cumulative impact of the project together with other activities or projects on the environment
 - xi. The contents of the EIA
- The contents of an EIA are listed in the Act's Third Schedule. According to this Act, an EIA must include a true statement and description of the following:
- i. The location of the project and its surroundings.
 - ii. The principle, concept and purpose of the project.
 - iii. The indirect or direct effects the project is likely to have on the environment.
 - iv. The social, economic and cultural effects that the project may have on society.
 - v. The communities, interested parties and Government Ministries consulted
 - vi. Any action or measures which may avoid, prevent, change, mitigate or remedy the likely effect on the society.
 - vii. Any alternatives to the project.
 - viii. Natural resources to be used in the project.
 - ix. The plans for decommissioning of the project.
 - x. Any other information, necessary for a proper review of the potential environmental impact of the project.

The Minister (The Minister of Environment), as stated in section 33, has the right to issue regulations requiring the Project owner (the proponent) to hold insurance or other necessary financial security. This is to guarantee payment of compensation for any damage resulting from the Project's operations. Alternatively, the proponent may guarantee payment, preventive measures, or rehabilitation where necessary.

This Act is the primary national environmental management instrument that guide the conduct of environmental management studies. It is so vital that, EDSA and Engineering, Procurement and Construction (EPC) contractors should pay particular attention to the provisions in this Act for this Project

4.1.3 National Electricity Act, 2011

The previous National Power Authority (NPA) was split into two new entities, EGTC and EDSA, by this Act. Part VI defines EDSA's primary purpose as the provision, distribution, and retail sale of electricity across the country, except in places where another eligible body has been granted a license.

Part X of the National Electricity Act of 2011 deals with land acquisition and related environmental practices, making this Act very important for this Project. This Act gives the Minister the powers to acquire land for EGTC or EDSA or both as long as adequate compensation is provided even if the land is private property or there is some private interest in the land.

This Act authorises the excavation of streets or highways for the purpose of laying a supply line, as well as the building of poles and other structures. The company or Authority should consult the relevant ministry before excavating any street and rehabilitate the street or road after the breakage.

Section 58 of the Act empowers the authority or company involved in electric power generation to cut or lop any tree, shrub, or hedge that obstructs or interferes with the company's or authority's supply line, the laying or erection of any supply line, or the proposed route of the supply. However, before the lopping and cutting of any tree, shrub, or hedge, the occupier of the land must be given fourteen days' notice. Under Sections 59 and 60 of the aforementioned Act, the Authority or designated company has the power to enter land previously acquired for a certain purpose. The Authority or designated company should give reasonable notice to the occupier of such land with the intention to enter and construct, respectively.

According to Section 62, all companies and independent power producers must follow all environmental, health, and safety regulations.

4.1.4 The Forestry Act, 1988

Sierra Leone's Forestry Act came into effect on 1st July 1988. With directives from the minister, the Chief Conservator of Forestry was designated as the responsible officer for implementing regulations that the Act informs. The chief conservator has the role of conserving the nation's forests, ensuring sustainable availability of forest products, and protecting the soil and water resources that serve as natural resources for the forest ecosystems.

The initial operation of electricity supply involves installations that may require the clearing of vegetation along the transmission line. Therefore part V, section 18 of this Act requires that the chiefdom council of any chiefdom may agree with the Chief Conservator providing for the constitution as a community forest of any land within the chiefdom, subject to the approval of the District Officer for the District in which the land is situated.

Subsection 2 of section 18 of the Forestry Act, 1988 states that every agreement shall, therefore:

- describe the areas to include in the forest by reference to geographical features, markers, co-ordinates and measurement, and indicates the same on a map of suitable scale, which shall be annexed to the agreement;
- describe the forest resources and potential of the area; indicate the purpose of tapping from the forest, such as the supply of fuel, building poles, production of commercial timber, protection of soil and water supplies;
- contain a detailed inventory of any rights that will be suppressed upon the utility of the forest, and provide for adequate compensation for such rights, either in money or through the allocation of equivalent right in other land within the chiefdom;
- contain a list of existing rights that will be confirmed by the agreement; be valid for a duration of not more than 99 years, as long as this is acceptable in light of the forest's intended use.

In this Act, part VI, section 21, subsection 2 indicates that no protected forest may be cut, burned, uprooted, damaged or destroyed, except with a written permission from the Chief Conservator. Removal of a national or community forest by whatever means, without legal

permission, is a crime punishable by a fine of not more than ten thousand Leones or a two-year prison sentence, or both.

In taking cognizance of the importance of conserving the environment, the Act has ruled in section 17, that anyone permitted to fell timber is liable to pay a reforestation fee. The charge is calculated depending on the amount of wood felled or extracted, and the rate is set by the Minister. The charge will be paid to the Chief Conservator and placed in a reforestation fund established by the Act. However, if the proponent completes reforestation at the conclusion of any activity and meets the Chief Conservator's satisfaction, the reforestation charge will be returned.

The Project involves the construction of electricity distribution lines along the existing roadway RoW close to the Western Area Peninsula National Park. The Forestry Act, 1988 is an important reference document that would guide EDSA and the EPC contractors in their work.

4.1.5 The Forestry Regulations, 1989

On July 1, 1990, these regulations came into force. As the head of the Forestry Division, the Chief Conservator has the same obligations as he did under the Forestry Act of 1988. Community forests are usually administered by the Forestry Division, although they can also be managed by the local government or a Community Forest Association with the Division's permission. As a result of the Division's responsibilities, no protected forest may be tampered with in any way without written authorization from the Chief Conservator of the Forest, as stated in section 21, subsection (2) of the Forestry Act, 1988. The project may be issued a license to clear land in a designated forest for such development projects as the proposed Project. However, having acquired his license, the proponent can only affect deforestation or vegetation removal from the environment under certain conditions. These conditions are highlighted below and can be found in section 15, subsection (3):

- Removal of vegetation can be done for an operation only within an area licensed for this purpose.
- The specified land areas shall be cleared within a stated time, but trees requested not to be felled, removed or damaged, are to be left standing.
- Trees to be felled shall be identified, except where total felling is authorized
- A forest severance fee and a minor forest produce fee shall be paid in respect of all forest product that is merchantable, which may be removed by clearance of vegetation.

- At the completion of the activity, the area shall be replanted with approved crops or trees by the proponent, or provision made for this to be done by payment of the estimated reforestation cost.
- The required method of cultivation and silviculture specified by the Chief Conservator must be employed.

For environmental reasons, section 38 of part XI states that no land between the high and low watermarks, nor those above the high water mark on both sides of the bank of any waterway, covering a distance of one hundred feet (approximately 33m), may be cleared of any vegetation unless a clearance license is obtained. Sacred bushes are protected by Section 40 laws, which state that clearing vegetation from land classified as a sacred bush is banned unless the Chief Conservator gives permission.

The Forestry Regulations, 1989 is an important reference document that would guide EDSA and the EPC contractors in their work

4.1.6 The Wildlife Conservation Act, 1972

This Act strengthens and improves the control of Sierra Leone's fauna and flora, as well as giving effect to the international convention on the conservation of fauna and flora in their natural state. The 1972 Wildlife Conservation Act is divided into seven sections.

- Part I: Preliminary
- Part II: Constitution of Strict Natural Reserves, National Parks. Etc.
- Part III: Hunting of Animals Generally, Licences And Permits
- Part IV: Trophies
- Part V: Evidence, Penalties and Forfeiture
- Part VI: General and
- PART VII: Schedules (First schedule - Non-hunting forest reserves; Second schedule - Prohibited animals; Third schedule - Protected animals; Fourth schedule - Game animals; Fifth schedule - Animals destruction of which must be reported; Sixth schedule - Dangerous animals; Seventh Schedule - Vermin and Eighth schedule - Restriction of weapons for hunting game animals)

As per Section 7, the following are prohibited unless otherwise authorized to do so under the Wildlife Act or regulation in any National Park, Strict Natural Reserve or game reserve:

- hunt or take possession of any wild animal;
- take any forest produce as defined in the Forestry Act;

- uproot, burn, strip the bark or leaves from, or otherwise damage any tree;
- set fire to any grass or herbage or kindle a fire without taking due precautions to prevent its spreading;
- permit any domestic animal to enter or trespass;
- do any act connected with the forestry, agriculture or mining, excavate or prospect, drill or level the ground or construct or perform any work involving the alteration of the configuration of the soil or the character of the vegetation;
- do any act likely to injure or disturb the flora or fauna;
- reside in or erect any building or make any camp;
- fish or attempt to kill fish;
- set any snare, net, trap or other instruments to catch or kill animals or likely to catch, kill or injure any animals;
- introduce any species of fauna and flora, whether indigenous or imported, wild or domesticated;
- construct any dam or weir across any river or stream or otherwise obstruct the channel of any river or stream;
- enter, traverse or camp.

Section 74 of the Act mandates the formulation of regulations and such regulation should not be limited to the following:

- the administration of National Parks, Game Reserves, Strict Natural Reserves, non-hunting Forest Reserve or any other such reserve;
- the prohibition, restriction, control or regulation of entry into, passage through or sojourning in such National Parks, Game Reserves, Strict Natural Reserves or any other such reserve or part thereof.
- the control of persons who, or animals (including domestic animals) which are in such National Parks, Game Reserves, Strict Natural Reserves or any other such reserve or part thereof either permanently or temporarily;
- the prohibition, restriction, control or regulation, or the introduction into, passage or conveyance through or keeping within such National Parks, Game Reserves, Strict Natural Reserves or any other such reserve or part thereof of any domestic animal;
- the prohibition, restriction, control or regulation of the burning of vegetation the felling, cutting and removal of timber in or from such National Parks, Game Reserves, Strict Natural Reserves or any other such reserve or part thereof;
- the prohibition, restriction, control or regulation of the searching for, and removal of, honey from National Parks, Game Reserves, Strict Natural Reserves or any other

- such reserve or part thereof;
- the prohibition, restriction, control or regulation of fishing in National Parks, Game Reserves, Strict Natural Reserves or any other such reserve or any part thereof;
- the prohibition, restriction, control or regulation of the carrying or possession of weapons in National Parks, Game Reserves, Strict Natural Reserves or any such reserve or any part thereof;
- the fees, if any, to be paid by persons entering such National Parks, Game Reserves, or any part thereof, or to be paid in respect of the doing of any specified thing therein or the use of any article or facility provided therein;

4.1.7 Wildlife Conservation Amendment Act, 1990

The Wildlife Conservation Act, 1972, and the Forestry Act, 1988 are the main legislations that deal with biodiversity conservation issues 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;
- Introduction of species from outside of the boundaries of the reserve.

The Wildlife Conservation Act, 1972 draws attention to the protection of wildlife within forest conservation areas. This Act will guide EDSA and the EPC contractors to ensure that areas that are prohibited from hunting are protected and destruction of all forms of wildlife species are discouraged.

4.1.8 The National Protected Area Authority and Conservation Trust Fund Act, 2012

This Act provides for establishing the National Protected Area Authority and Conservation Trust Fund to promote biodiversity conservation, wildlife management, research, and provide for the sale of ecosystems services in the National Protected Areas and other related matters.

The Authority is established to exercise oversight authority over National Parks and Protected Areas designated for conservation purposes in order to protect the fauna and flora in their natural state and promote sustainable land-use practices and environmental management, as stated in Part III, Section 12.

The authority can formulate and implement awareness activities for local communities, schools, and local government to increase public awareness of and engagement in activities and services related to socio-economic and environmental issues, such as fisheries, agricultural and forestry best practices, forest management, land, soil, and water conservation in Protected Areas and buffer zones, according to Section 12 subsection (2) paragraph (i) of the Act.

The authority has the mandate to develop and promote National Protected Area corridors and buffer zones conservation strategies based on the principles of multiple-use and co-management

The Act also provides for the development and approval of management plans, zoning and National Protected Area regulations.

The Authority may enact regulations as it deems necessary or expedient to give effect to the requirements of this Act, as stated in Section 27 subsection (1). Thus, this Act provides for the development of a regulation that prohibits, restricts, controls or regulates the burning of vegetation or the cutting, felling or removal of timber in or from the National Protected Area or any part thereof as in Section 27 subsection (2) paragraph (e). So far, there is no regulation as prescribed by the Act.

4.1.9 Sierra Leone Roads Authority (Amendment) Act, 2010

The Sierra Leone Roads Authority (SLRA) Act of 2010 is an amendment of the 1992 SLRA Act. According to the amendment of Act No.2 of 1992 section 5 subsection 2 paragraph C, "For the attainment of the object stated in subsection 1, the Authority shall set the width of

the right-of-way for roads that form part of the national network," the Authority has the legal authority to set the width of the RoW.

The SLRA is the institution in charge of administering the country's roads. Their mission is to construct and maintain the national road network, provide general road policy advice to the government, and help to the resolution of transportation issues. Sierra Leone's RoW issues are managed by the SLRA. The Project's electricity distribution lines shall be constructed along the RoW. EDSA shall hold consultations with the SLRA on the use of this facility.

4.1.10 The Factories Act, 1974

This Act became effective on the 30th of May 1974. It deals with health and safety measures as they concern any factory worker. It protects the worker through demands for all aspects of cleanliness, reports of all injuries, accidents, diseases, and death.

A Factories Appeal Board is in place, and it is responsible for hearing and deciding any appeals filed by factory owners, ensuring that justice is served. Industrial companies are factory-based companies, according to this Act's understanding of the 'word factory', and are thus covered by any legislation pertaining to this industry. This Act covers workplace health and safety, ensuring that:

- Enough and suitable sanitary facilities to be provided for employees;
- Any restrictions enacted under any portion of the act that are to be enforced in the workplace should be posted in the factory in printed form;
- Owners of factories shall make sure the necessary precautions are taken to ensure the safety of employees;
- Competent persons should oversee machinery and that two or more engineers should not oversee one machinery;
- Any factory machinery developing more than 250 horsepower or where any amount develops more than 75 horsepower, should be under the general supervision of an engineer;
- Any factory having machinery developing more than 250 horsepower shall be inspected regularly by an engineer;
- Accidents should be reported to the respective authorities as prescribed in the act

This Act addresses occupational health and safety issues, hiring of experts, work permits, and hiring of labour, which is very important for this Project. EDSA and particularly the

EPC contractor should constantly reference this document. A Labour Management Plan for this Project is also available (*See Annex i*)

4.1.11 Public Order Act, 1965

Section 13 of the Public Order Act of 1965 outlines street noise without making reference to environmental noise. This criminalizes any noise from noisy instruments, music, or singing before 6 AM in the morning and after 10 PM at night. EPC contractors shall heed to this regulation.

4.1.12 The Local Government Act, 2004

This Act governs the creation and operation of local councils across the country in order to facilitate real decentralization and devolution of government functions. A local council is the locality's highest political authority, with legislative and executive powers to be exercised under this Act or any other statute. Generally, it shall be responsible for promoting the development of the locality and the welfare of the people in that locality. The local council shall source resources allocated by the central government and its agencies, national and international organizations, and the private sector.

Proponents are bound to operate within areas controlled by one local council or shared by two or more local councils. There is also a relationship between the local council and the Chieftdom within which a proponent operates. Hence, proponents shall involve local councils in their development work. The schedules in the Local Government Act outline the functions of various Ministries Departments and Agencies (MDAs) that have been devolved to local councils.

The Project is within the jurisdiction of a local councils (WARD-C). This council is mandated to monitor Project activities as they house the environment, monitoring and evaluation officers.

4.1.13 The Sierra Leone Road Safety Authority Act 1996 (amended 2016)

The Road Transport Authority (Amendment) Act 2003, the act established the Corps of Traffic Wardens to complement the Sierra Leone Police Force with regard to traffic duties and by exercising the following duties:

- Educate the public on road safety;
- Regulate and control traffic;

- Render the roads free from unnecessary obstruction and ensure the free flow of traffic;

SLRSA regulates traffic and road safety in the country and this will have a bearing on the distribution line route.

4.2 National Policy Framework

4.2.1 Nuclear Safety and Radiation Protection Act, 2012

This Act defines issues relating to radiation, which is also a concern for the environment. This Act regulates, controls, and oversees the acquisition, importation, exportation, transit, and disposal of radioactive substances and devices that release ionizing radiation. Non-ionizing radiation substances has been added to the amended version of this Act.

According to Sections 29 and 30 of this Act, a license is required for any nuclear material, equipment, or technology, including its export and import, re-export, transit, and transshipment. A written application for such a license should be submitted to the radiation authority, along with a determination of the radioactive substance or equipment producing ionizing radiation's nature, as well as the magnitude and likelihood of exposure attributed to the substance or device; a description of the installation or practice; a safety impact assessment for worker and public protection; all relevant information to support the application; and the prescribed fee. This Act is important for this Project because of the possible non-ionizing radiation that might be emitted from transformers.

4.2.2 The National Lands Policy, 2015

This strategy emphasizes land distribution (acquisition and allocation), land tenure systems, land use planning and regulations, land management and administration systems, and land adjudication systems for all Sierra Leoneans and investors. It is these guiding land and compensation issues that make this policy important to the Project

- A. The National Lands Policy has the following policy statements: The sovereign title to Government/State lands and public lands shall vest in the National Lands Commission as follows:-
- I. As to Government/State lands in trust for the citizens of Sierra Leone as a whole; and
 - II. As to public lands in trust for the citizens of Sierra Leone as a whole or in trust for the particular community that originally owned the land as prescribed by the statute or other law creating the same; and
- B. The sovereign title to private lands shall henceforth vest as follows:-

- I. As to land held under freehold tenure in the Western Area in the individual, group of individuals or corporate entity absolutely;
- II. As to communal lands in the Provinces in the new Chiefdom Lands Committee (instead of the Chiefdom Council) in trust for the particular community concerned;
- III. As to family lands held under family tenure in the Province in the family as a unit;
- IV. As to land held under Customary tenure in the Provinces in the Chiefdom Lands Committee/Village Area Lands Committee or the family which made the grant of usufructuary rights in perpetuity to the groups or individuals or corporate entity subject to the grantor's residuary rights.

The policy states that the acquisition must be for the purposes of (1) defense, (2) public safety, (3) public order, (4) public morality, (5) public health, (6) town and country planning, and (7) development and usage of the land for the public good.

4.2.3 The National Environmental Policy, 1994

The National Environmental Action Plan (NEAP) was an outcome of the 1992 Rio Declaration on Environment and Development after endorsement by the GoSL. The NEAP recommended a set of actions that were to be taken to redress environmental degradation and facilitate the sustainable utilization of natural resources. One of the NEAP recommendations was to develop a National Environmental Policy.

The National Environmental Policy was developed in 1994 to promote sustainable social and economic development through sound management of the Sierra Leone environment. The policy promotes co-operation with other governments, relevant international/regional organizations, local communities, Non-Governmental Organizations (NGOs), and the private sector.

All Ministries, Departments, and Agencies (MDAs), as well as development initiatives, are required by the National Environment Policy to ensure that all Sierra Leoneans have a good quality of life. The Policy states that Sierra Leoneans must enjoy an adequate and sustainable quality of life by fulfilling basic needs and providing useful amenities through appropriate strategies. A key policy objective is to ensure the provision and maintenance of adequate and affordable healthcare for all. The recently established Ministry of the Environment now houses the National Environmental Policy, 1994. It facilitates, coordinates, and plays advisory roles in ensuring its implementation and set of relevant and acceptable standards.

4.2.4 The National Forestry Policy, 2010

The goal of the National Forestry Policy, 2010, is for the conservation, establishment, protection, and management of trees and forests for the sustainable development of Sierra Leone. To ensure sustainable forest management, the Policy focuses on eight priority areas: (i) forest land management, (ii) wetlands management, (iii) forest-based industry and products, (iv) ecosystem conservation management, (v) education and awareness, (vi) research and monitoring, (vii) capacity building, and (viii) strategic planning.

Under forest land management, the Policy aims at empowering rural communities to conserve and develop Sierra Leone's forest resources for the economic and environmental benefit of the present and future generations. This entails promoting economic opportunities that encourage reforestation and planting trees as a business, e.g. trees for poles.

4.2.5 National Policy for Development-Induced Resettlement, 2021

This Policy guides the planning and implementation of development induces resettlements in the country. It demonstrates the Government's commitment to ensure that development planning in Sierra Leone meets the national strategic vision to achieve sustainable development in all aspects of national life.

4.2.6 Conservation and Wildlife Policy 2010

The conservation and wildlife policy's vision looks at '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 focus on six priority areas:

- i. Species Management for Conservation;
- ii. Wildlife Conservation Areas;
- iii. Wildlife Outside the Wildlife Conservation Area System;
- iv. Wildlife Research and Monitoring;
- v. Wildlife Education and
- vi. Awareness and Human Capacity-building for Wildlife Management.

4.2.7 The Sierra Leone Electricity and Water Regulatory Commission (SLEWRC) Act, 2011

This Act establishes the Sierra Leone Electricity and Water Regulatory Commission. Therefore, the commission is responsible for formulating, implementing, monitoring quality and compliance, providing tariff guidelines, licenses, and implementing regulatory frameworks for the safe, secure, affordable and reliable supply of water and electricity in Sierra Leone.

4.3 International Environmental Instruments/Obligations for Sierra Leone

Sierra Leone endorses and adheres to internationally accepted principles of the 1972 Stockholm Declaration and the 1992 Rio Declaration as adopted by the United Nations Conferences. Sierra Leone is also a signatory to the following environmental conventions: - Convention on Wetland of Significant Importance (RAMSAR); Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES); African Convention on Conservation of Nature and Natural Resources; Montreal Protocol for the Protection of the Ozone Layer; Cartagena Protocol on Substances that deplete the Ozone Layer; Convention on Biological Diversity (UNCBD); Convention on Climate Change (UNFCCC); and the Convention on Desertification (UNCCD) and the Stockholm Convention on Persistent Organic Pollutants(POPs).

These conventions, protocols, and treaties promote the conservation of the environment and natural resources as well as occupational health and safety of workers while acknowledging the importance of social and economic development. This Project triggers compliance with these international environmental instruments.

4.3.1 The Stockholm Convention on Persistent Organic Pollutants (POPs)

Sierra Leone became a signatory to the Convention on the 27th of August 2001, after it was adopted on the 22nd of May 2001 in Stockholm. Chemicals that are persistent bio-accumulators in fatty tissues are known as persistent organic pollutants (POPs). They are bio-magnified and have negative health and environmental consequences as a result of their spread in the food chain.

All POPs produced and used internationally should be banned or restricted, according to this convention (i.e. Industrial chemicals and pesticides). Aldrin, Chlordane, Dieldrin, Endrin, Heptachlor, Hexachlorobenzene (HCB), and Polychlorinated Biphenyl (PCB) are

among the chemicals to be phased out (PCBs). The treaty also aims to continue reducing and, where possible, eliminating POPs like dioxins and furans from the environment. Stockpiles and garbage containing POPs must be managed and disposed of in accordance with international norms, standards, and recommendations in a safe, efficient, and ecologically friendly manner.

4.3.2 JICA Guidelines for Environmental and Social Considerations, 2010

The JICA Guidelines is a technical document that outlines the principle, and appropriate environmental and social considerations. The basic underlying principles for intending project outlined by the JICA Guidelines are as follows

- i. Environmental impacts that may be caused by projects must be assessed and examined in the earliest possible planning stage. Alternatives or mitigation measures to avoid or minimize adverse impacts must be examined and incorporated into the project plan.
- ii. Such examinations must be endeavored to include an analysis of environmental and social costs and benefits in the most quantitative terms possible, as well as a qualitative analysis; these must be conducted in close harmony with the economic, financial, institutional, social, and technical analyses of projects.
- iii. The findings of the examination of environmental and social considerations must include alternatives and mitigation measures and must be recorded as separate documents or as a part of other documents. EIA reports must be produced for projects in which there is a reasonable expectation of particularly large adverse environmental impacts.
- iv. For projects that have a particularly high potential for adverse impacts or that are highly contentious, a committee of experts may be formed so that JICA may seek their opinions, in order to increase accountability.

4.3.3 World Bank (WB) Guidelines: Environmental, Health, and Safety Guidelines, General EHS Guidelines, 2007

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents that provide general and sector-specific examples of acceptable international industry practice. These generic EHS guidelines should be used in conjunction with the respective Industry Sector EHS guidelines, which provide guidance on EHS challenges unique to certain industries. The World Bank has

multiple rules under the EHS guidelines, many of which apply to various components of the proposed Project, including:

- a) EHS Guidelines - Environmental
 - Hazardous Materials Management
 - Waste Management
 - Noise
 - Contaminated Land
- b) EHS Guidelines - Occupational Health and Safety
 - General Facility Design and Operation
 - Communication and Training
 - Physical Hazards
 - Chemical Hazards
 - Biological Hazards
 - Personal Protective Equipment (PPE)
 - Special Hazard Environments Monitoring
- c) EHS Guidelines – Community Health and Safety
 - Structural Safety of Project Infrastructure
 - Life and Fire Safety (L & FS)
 - Traffic Safety
 - Transport of Hazardous Materials
 - Emergency Preparedness and Response

d) EHS Guidelines - Construction and Decommissioning

- Environment
- Occupational Health & Safety
- Community Health & Safety

4.3.4 World Bank Environmental, Health, And Safety Guidelines for Electric Power Transmission and Distribution

Power transmission between a generation plant and a substation within an energy grid, as well as power distribution from a substation to users in residential, commercial, and industrial regions, are covered by the EHS Guidelines for Electric Power Transmission and Distribution. Some of the following are addressed in the EHS Guidelines:

- Construction site waste generation;

- Terrestrial Habitat Alteration
 - Construction of Right-of-Way
- EDSA and the EPC contractors must take note of these guidelines.

4.3.5 World Bank Environmental and Social Standards (ESSs)

The ESSs are technical reference documents that form part of the World Bank's 2016 Environmental and Social Framework (ESF) that guide the proponent on their application with general and industry-specific examples of Good International Industry Practice (GIIP).

These industry sector ESS guidelines are designed to be used together with the General EHS Guidelines document, which guides the developer, in this case, the Ministry of the Environment, on environmental, health, and social issues potentially applicable to this Project.

These guidelines are considered for implementing the Project of Extension of Power Distribution System along the Freetown Peninsula, with specific application to the construction of power distribution lines and substations along the Freetown Peninsula. The ESS guidelines contain the measures generally considered achievable in constructing new facilities using existing technology at reasonable costs.

Where Sierra Leone regulations differ from the measures presented in the ESS Guidelines, the Project will be expected to apply whichever is more stringent, and for this case, the ESS guidelines. In short, the ESS guidelines shall be used in conjunction with applicable Sierra Leonean laws such as the Factories Act, 1974 and the Public Health Ordinance Act, 1960 and Public Health Act, 2004.

Table 7 presents summaries of the relevant standards and how they will be addressed in the Project.

Table 7: Summary of World Bank ESS Relevant to the Project

ESS No.	Summary of ESS	Project Implications for the ESS	Remarks (when it applies)
ESS 1	<p>Assessment and Management of Environmental and Social Risks and Impacts:</p> <p>ESS 1 prescribes that projects require assessing and managing environmental and social risks and impact analysis. The evaluation is done to help improve decision-making to ensure that they are environmentally sound and sustainable. Projects are screened to establish the scope and type of assessment that is required. Depending on the nature of the project, the Bank divides it into four categories, depending on the project's type, location, sensitivity, and scale and the nature and magnitude of its potential environmental impacts.</p>	<p>The construction of distribution lines and substations in the Project area will demand land, which may involve loss of vegetation cover, livelihood, and income. It is expected that these impacts will trigger this safeguard.</p>	<p>The Project has a sustainable risk because the likely impacts are readily identified, mitigation and management measures are proposed in this ESHA.</p>
ESS 2	<p>Labour and Working Conditions: The importance of job development and income generation in the quest of poverty reduction and inclusive economic growth is recognized in this ESS. The project proponent, on the other hand, is required by ESS 2 to foster excellent worker-management interactions and maximize the project's development advantages by treating project workers fairly and providing safe, healthy working conditions. The objective of ESS 2 is to promote safety and health at work, promote fair treatment, prevent the use of all forms of forced labour, and support the principles of freedom of association.</p>	<p>This ESS requires that workers' health and working conditions be considered necessary in the workplace. They are treated fairly and in a non-discriminatory manner and treated with equal opportunity.</p>	<p>The Project shall employ contract staff, community labour, and primary supply workers as appropriate. Thus, labour and working conditions would be well managed, and the labour and working conditions are addressed in this ESHA.</p>
ESS 3	<p>Resource Efficiency and Pollution Prevention and Management: This ESS recognizes that such projects frequently pollute the air, water, and land, as well as deplete scarce resources, posing a harm to people,</p>	<p>Wooden poles are not expected to be used.</p>	<p>Steel tubular poles/towers will be used for this Project.</p>

ESS No.	Summary of ESS	Project Implications for the ESS	Remarks (when it applies)
ESS 4	<p>ecosystem services, and the environment on a local and regional basis. The policy also applies to the management of all chemicals that pose a threat to the environment. World Bank supports a strategy that promotes the use of biological or environmental control methods and reduces reliance on synthetic chemical pesticides.</p> <p>Community Health and Safety: ESS4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. Also, communities that are already subjected to impacts from climate change may experience acceleration or intensification of results due to project activities.</p>	<p>There are health, safety, and security risks and impacts on Project-affected communities.</p>	<p>The corresponding responsibility of EDSA and contractors shall be to avoid or minimize such risks and impacts, with particular attention to people who may be vulnerable because of their specific circumstances. Issues of community health and safety at the community and Project level are provided for in this ESHA.</p>
ESS 5	<p>Land acquisition, Restrictions on Land Use, and Involuntary Resettlement: This ESS acknowledges that project-related land acquisition and land-use limitations can have negative consequences for communities and individuals. Physical displacement (relocation, loss of residential land, or loss of shelter) or economic displacement (loss of land, assets, or access to sources or other means of subsistence) may result from project-related land acquisition or limits on land usage.</p>	<p>Construction of distribution lines and substations will require land. This could include land use limitations and economic relocation (loss of land, assets, or access to assets leading to loss of income sources or other means of livelihood). These</p>	<p>Although the distribution line route shall follow the RoW, the substations require land acquisition. Any potential of a loss of land, assets, or access to assets leading to a loss of income sources or other means of life will be addressed through a "resettlement plan"</p>

ESS No.	Summary of ESS	Project Implications for the ESS	Remarks (when it applies)
		<p>activities will trigger this safeguard.</p> <p>The implication here is that the Project should improve the living conditions of poor or vulnerable persons affected rather than leaving them in abject poverty or a worse state than before Project activity(ies).</p>	
ESS 6	<p>Biodiversity Conservation and Sustainable Management of Living Natural Resources: The Bank supports the protection and conservation of biodiversity and sustainably managing living natural resources as these are fundamental to sustainable development.</p> <p>Requirements related to ecosystem services are set out in ESS1.</p>	<p>The possibility for disruption of ecosystem services and biodiversity is low for Project operation and during construction and rehabilitation activities.</p>	<p>There are no known natural habitats along the Project routes (existing roadway, RoW) and substation sites.</p>
ESS 8	<p>Cultural Heritage: Cultural legacy, in all of its forms, is crucial as a source of rich scientific and historical information, as an economic and social asset for development, and as an integral element of people's cultural identity and practice, according to this ESS. The objective of this ESS is to protect cultural heritage from the adverse impacts of project activities and promote meaningful consultations with stakeholders regarding cultural heritage.</p>	<p>The possibility for disruption of cultural heritage is very low for this Project.</p>	<p>There are no known cultural heritage sites or intangible bodies along the Project route and substation sites. Should contractors encounter any, these will be mitigated through measures outlined in a chance find</p>

ESS No.	Summary of ESS	Project Implications for the ESS	Remarks (when it applies)
			<p>procedure included in this ESHA (See Annex #)</p>
ESS 10	<p>Stakeholder Engagement and Information Disclosure: ESS 10 recognizes that effective stakeholder engagement can improve projects' environmental and social sustainability, enhance project acceptance, and significantly contribute to the design and implementation of a successful project.</p> <p>Stakeholder engagement is a process that takes place at all stages of a project's life cycle. Where adequately designed and implemented, it supports the development of strong, constructive responsive relationships that are important for successfully managing a project's environmental and social risks.</p>	<p>The Project will impact the social and economic life of people and their environment. For any such Project to be sustainable, stakeholder engagement has to be conducted throughout the Project's life cycle.</p>	<p>The preparation of this report has gone through extensive stakeholder engagement and Project information disclosure.</p>

4.3.6 Comparison of Sierra Leonean Regulations and World Bank's ESS2

Table 8 presents a comparison of the Sierra Leonean regulations against ESS2 and provides measures to fill the gaps related to safeguards for labour and working conditions. ESS2 dictates that such projects develop a labour management procedure. Annex i in this report provides the labour management procedures for this Project.

Table 8: Comparison of the Laws of Sierra Leone and World Bank ESS2 concerning Labour and Working Conditions

Category	The Laws of Sierra Leone	ESS2	Gap Filling Measures Under the Project
Working conditions	The Constitution of Sierra Leone, 1991 prohibits discrimination by the state and individuals. Sierra Leone has little domestic legislation giving effect to the right to non-discrimination. Notably, the country lacks non-discrimination provisions in key fields such as employment.	ESS2 requires the client to set out in a non-discrimination labour management procedure to manage the project worker. The terms and conditions of the employment to include his rights related to hours of work, wages, overtime, compensation and benefits.	ESS2 will be followed
Protecting the workforce	The minimal age for a youngster to be engaged in light work is thirteen years old. The Child Rights Act of 2007 (Section 127) According to Section 125 of the Child Rights Act, 2007 and Section 52 of Chapter 212, Employers and Employed Ordinance, 1935 the minimum age of work for a child is 15. According to Section 128 of the Child Rights Act, a person must be eighteen years old to be engaged in hazardous work. Sections 47-56 of Chapter 212, Employers and Employed Ordinance, 1935 An employer is required to keep a register of children and young persons employed with their birth date or apparent	This ESS requires the project labour management procedure to specify the minimum age for employment in accordance with national laws and WB guidelines which is 14 years.	ESS2 will be followed because appropriate risk assessment is required prior to work commencing and regular monitoring of health, working conditions, hours of work and other requirements.

	ages as in Section 130 of the Child Rights Act, 2007. Part II, Section 2, and Part IV, Sections 14-15 and 21 of the Anti-Human Trafficking Act 2017 Section 19 of the Constitution of Sierra Leone prohibits forced labour. Part II, Section 2, and Part IV, Sections 14-15 and 21 of the Anti-Human Trafficking Act of 2005; Section 60 of the Child Rights Act, 2007 prohibits child trafficking. PART VIII Chapter 212 of the Employers and Employed Act, 1935 covers Breach of Contract and Disputes Between Employers and Employed.	This ESS mandates the provision of a grievance system for all direct and contracted workers, as well as their organizations, to express workplace complaints.	ESS2 will be followed
Grievance mechanism	Factories Act, 1974 deals with health and safety measures as they concern any factory worker. It protects the worker through demands for all aspects of cleanliness reports of all injuries, accidents, diseases, and death.	This ESS considers the General Environmental Health and Safety Guidelines (EHSGs), as well as industry-specific EHSGs and other Good International Industry Practice, as appropriate (GIIP) It takes into consideration (a) Identifying potential project worker hazards, particularly those that could be fatal; b) implementing preventative and protective measures, such as changing, substituting, or eliminating dangerous circumstances or substances; c) project worker training and maintenance of training records; d) record-keeping and reporting of workplace injuries, illnesses, and occurrences; e) emergency prevention, preparedness, and response plans in the event of an emergency; and (f) redress for negative consequences such as workplace injuries, deaths, disability, and disease.	ESS2 will be followed
Occupational Health and Safety (OHS)			

Contracted workers	PART II and PART VIII Chapter 212 of the Employers and Employed Act, 1935 covers of contract workers.	This ESS requires proponents to make reasonable measures to ensure that third parties who engage contractual workers are legal and reliable companies, and that they have in place project-specific labor management practices that will allow them to function in line with the ESS's criteria.	ESS2 will be followed
Community workers	There is no known written law with respect to community works but there is a normal practice of food for work.	In situations where the project includes the provision of labour by community workers, the client shall ensure that, according to ESS 2, the employment should reflect and be proportionate to: (a) The project's nature and scope; b) The community workers' specialized project activities; and (b) The nature of the potential dangers to community workers and their consequences.	ESS2 will be followed
Primary supply workers	Primary supply workers should also follow child labour, forced labour and safety issues in the child Right Acts, 2007; Employer and Employed, 1935 and the Factories Act of 1974	This ESS requires that where there is a significant risk of child labour or forced labour related to primary supply workers, the client requires the primary supplier to identify those risks. The labour management procedures will set out roles and responsibilities for monitoring primary suppliers. If incidents of child labour or forced labor are discovered, the client will expect the major supplier to take necessary action to rectify the situation.	ESS2 will be followed

4.4 Institutional Framework

As in all projects, some institutions are responsible for the planning, design, and implementing of project deliverables. In a similar vein, the implementation of environmental and social safeguards is the responsibility of these same institutions. This section discusses the institutions responsible for this Project.

4.4.1 The Ministry of Energy (MoE)

The Ministry of Energy is the arm of the Government of Sierra Leone tasked with formulating and implementing energy policies, projects, and programs, as well as providing oversight functions for all sub-sector agencies (including electricity production, transmission, distribution, and supply) and other forms of energy supply and utilization, coordinating and managing all aspects of energy in its various forms in the country. The Ministry has oversight responsibility over EDSA, and therefore, all technical and financial matters of the Project will have clearance from the Minister and his technical team.

4.4.2 The Ministry of the Environment

The Ministry of the Environment, established in November 2019, is responsible for a range of government policies related to protecting and managing the environment and natural resources. The responsibility for managing and protecting the environment lies with the new Ministry of the Environment, which oversees the Environment Protection Agency, National Protected Areas Authority (NPAA), Nuclear Safety and Radiation in Sierra Leone, and the Standards Bureau. The political head of the Ministry is the Minister and has the superseding mandate to handle all matters as regards the environment

Prior to the formation of the new Ministry of the Environment, the Department of the Environment (DOE) created the National Environmental Action Plan with World Bank assistance (NEAP). It is divided into two parts. The first volume examines Sierra Leone's environmental problems and suggests solutions. The environmental proposals are contained in the second volume. There is a National Environmental Policy (NEP) in the works. The NEP's aims, objectives, and strategies are all geared toward achieving Sierra Leone's long-term growth through solid environmental management.

The Ministry is mandated to perform the following functions:

- Lead on the development and supervision of the legal and policy framework for building national environmental resilience as it relates to climate change, natural resources management, including forestry and wetlands conservation

- Provide policy advice to the President and government, take the lead on all aspects of the environment and in particular make recommendations for the protection and management of the environment
- Formulate and review environmental policies, legislation, and standards to ensure consistency and application of international policies relating to environmental protection to safeguard human health and wellbeing of people in Sierra Leone
- Develop, coordinate and implement climate change legislation, adaptation and mitigation policies and strategies, programmes, and initiatives in the country
- Develop policies to ban and reduce the abusive use of plastic bags and on the protection and management of environmentally sensitive areas
- Ensure environmental compliance and enforcement in Sierra Leone through EPA-SL
- Coordinate relations with national and international organizations dealing with environmental issues
- Collaborate with all relevant Ministries, Departments, and Agencies working on environmental issues
- Mobilize resources in support of the strengthening environmental resilience
- Perform any other function assigned to the Ministry by law or decision of the Cabinet of Sierra Leone

This recently established Ministry has a huge mandate. It supervises the Environment Protection Agency, Nuclear Safety and Radiation Protection Authority, and the Forestry Department. All issues dealing with environmental impact assessment, environmental and social management plans, resettlement planning, and radiation protection have to be cleared by the Minister with the portfolio. Thus, EDSA and the contractors must continue updating the Ministry about the progress the Project is making and the challenges.

4.4.3 Electricity Generation and Transmission Company

According to the approved power purchase agreement, EGTC is responsible for generating, transmitting, and selling electricity to EDSA. The national transmission system, which connects electricity-producing sources to consumer centres for distribution, is likewise be managed by EGTC.

4.4.4 The Electricity Distribution and Supply Authority

Key functions of EDSA include:

- i. responsible for the supply, distribution, and retail sale of electricity for the entire country except in areas which the commission has issued a distribution license to

- ii. another appropriately qualified entity;
- iii. Be responsible for dispatch and system control of electricity within its territory;
- iv. Establish as far as is practicable uniform standard voltages throughout its area of supply;
- v. Secure the supply of electricity at reasonable prices;
- vi. Carry on any business usually associated with electricity distribution and supply;
- vii. Promote and encourage the economical and efficient use of electricity, especially for domestic, commercial, agricultural, industrial, and manufacturing purposes; and
- viii. Perform any other functions incidental or consequential to its functions under this Act.

EDSA has the mandate to handle transmission and distribution issues.

4.4.5 The Electricity and Water Regulatory Commission

Sierra Leone's Electricity and Water Regulatory Commission was established in 1992. Its main functions are to formulate, implement, monitor quality and compliance, offer tariff guidelines, licenses, and implement regulatory frameworks for Sierra Leone's safe, secure, cheap, and dependable water and electricity supply.

4.4.6 Nuclear Safety and Radiation Protection Authority

The Nuclear Safety and Radiation Protection Authority regulates and supervises the beneficial and peaceful uses of radioactive substances and their applications in Sierra Leone, including licensing, inspection, and enforcement, to ensure that the public, workers, and the environment are adequately protected from the harmful effects of radiation. The Nuclear Safety and Radiation Protection Act of 2012 establishes the Nuclear Safety and Radiation Authority's mandate and responsibilities. (Radiation Protection Board) as a Regulatory Authority for Radiation Protection, Nuclear Safety and Security, Waste Safety, and ionizing and non-ionizing radiation.

The Authority's vision is to protect people, property, and the environment in Sierra Leone against radiation exposure that can cause cancer and other disorders. The Authority seeks to establish the maximum level of protection consistent with the International Atomic Energy Agency's (IAEA) and other international organizations' regulations.

The Authority further regulates, controls, and monitors the use, purchase, importation, exportation, transportation, and disposal of radioactive substances and devices that emit

ionizing and non-ionizing and non-ionizing radiation. This makes the Authority very important for this Project.

4.4.7 Environment Protection Agency - Sierra Leone

The EPA was created to take the place of the National Commission for Environment and Forestry (NaCEF), which was in charge of overseeing forestry and environmental matters. The following are some responsibilities of the Agency under the Act:-

- advise the Minister on the formulation of policies on all aspects of the environment and in particular make recommendations for the protection of the environment;
- co-ordinate the activities of bodies concerned with the technical or practical aspects of the environment and serve as a channel of communication between such bodies and the Minister;
- co-ordinate the activities of such bodies as it considers appropriate for the purposes of controlling the generation, treatment, storage, transportation and disposal of industrial waste;
- issue environmental permits and pollution abatement notices for controlling the volume, types, constituents and effects of waste discharges, emissions, deposits or other sources of pollutants and of substances that are hazardous or potentially dangerous to the quality of the environment or any segment of the environment;
- issue notices in the form of directives, procedures or warnings to such bodies as it may determine for the purpose of controlling the volume, intensity and quality of noise in the environment;
- prescribe standards and guidelines relating to ambient air, water and soil quality, the pollution of air, water, land and other forms of environmental pollution, including the discharge of wastes and the control of toxic substances;
- ensure compliance with any laid down environmental impact assessment procedures in the planning and execution of development projects, including compliance in respect of existing projects;
- promote effective planning in the management of the environment; etc.

4.4.8 The Sierra Leone Roads Authority

The SLRA is the body in charge of administering the country's roads. Their mission is to construct and maintain the national road network, provide general road policy advice to

the government, and help to the resolution of transportation issues. Sierra Leone's RoW issues are managed by the SLRA.

SLRA shall play a key role in this Project by handling issues of permission and clear identification of the RoW.

SECTION 5: ENVIRONMENTAL BASELINE OF THE PROJECT AREA

Environmental baseline data is essential to understand the physical and biological characteristics of the Project's environment. Such information sets the ground for analyzing the potential impacts of the Project's activities on the existing environment. Therefore, the environmental baseline data collection focuses on the information required to assess the Project area's environmental impact.

5.1. Topography

The WARD geography is defined by the narrow and nearly parallel Ranges of highlands running through the heart of the Freetown Peninsula and the low-lying Koya plains at the foot of the forest-covered mountain ranges (Cline-Cole, 1987). Along a narrow stretch of seaside beachfront, the hills rise from 200 to 965 metres above sea level. The ranges' highest points, Sugar Loaf Mountain and Picket Hill, are made up of basic and ultra-basic rocks (Larbi, 2011). This undulating landscape is approximately 37 kilometres long and 14 kilometres wide (Okoni-Williams et al., 2001). While describing the region's scenery, Munro (2009) remarked that this is likely the only spot in West Africa where mountains rise from the shore. The rising mountain ranges from the shore influence the region's weather and climate patterns.

5.2 Land Use

Land tenure system has a significant impact on land use. Sierra Leone's dualistic land tenure system results from British colonial administrations that ruled the country until 1961 (Njoh & Akiwumi, 2012). Unlike the communal and customary property ownership in the provinces, where the Paramount Chiefs are the stewards of land, a nineteenth-century statutory English Land Law that guarantees absolute freehold regulates land ownership in the WA (Renner-Thomas, 2010; Turay, 2006). This meant that, unlike in the provinces, where social capital (kinship and ties) determined who owned and controlled land, the cash economy is the principal determinant of who owned and controlled land in the Western Area. Much of the land in the WARD is either privately owned in freehold tenure or managed by the government as land banks, forest reserves for potential national

development projects. One of the principal uses of land at the foot of the ridges around WARD is for housing development. Coderich to Sussex is highly built-up following the end of the war in 2002. The built-up areas are predominantly influenced by the high demand for housing given the growth in population and the Tokeh Peninsula Highway that has been in construction since 2000. Towards the coastal areas of this zone, low-lying areas are used to cultivate vegetables. Beyond Sussex village, there are low-density residential areas. Given the rate of development that the region is witnessing, it is anticipated that the area will become densely populated in the next five years. The forest covering the high ridges is used for local communities' charcoal burning, woodcutting, and medicinal purposes.

5.3 Climate

Sierra Leone's climate is tropical, with hot and humid weather at the shore and a more temperate climate inland. Between 1961 and 2020, the average annual temperature was 26.7°C, with an average annual rainfall of 2,746 mm. The wet season is heavily influenced by the movement of the tropical rain belt, Inter-Tropical Convergence Zone (ITCZ), which oscillates between the northern and southern tropics over the course of a year.

Humidity varies between 50% and 90% and peaks at the height of the rainy season in August. The lowest levels of humidity are in January when the Harmattan winds start to blow in from the Sahara.

The seasonality of the weather conditions described above primarily results from the north-south movement of a discontinuity zone often referred to as the Inter-Tropical Front (ITF). As the belt oscillates slowly across West Africa, the country is alternately affected by southwest winds bringing moist air that often results in rain and dry northeast winds.

Freetown Peninsula experiences some of the heaviest rainfall in the country, with annual rainfall ranging from 3000-7000mm (Birchall et al., 1979). Mean daily temperatures vary between 25-30°C in the dry season and 22-27°C in the rainy season. Relative humidity at 1500 hours varies between 45% and 80% annually.

Rainfall data covering the project area was obtained from the Meteorology Agency in Freetown. The Agency collates monthly rainfall data in some major towns in the country. Monthly rainfall data were available for 2015 – 2020.

Table 9: Monthly Rainfall Data for Western Area (2015 - 2020)

MONTHLY RAINFALL(MM) DATA FOR THE WESTERN AREA												
YEAR	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEPT	OCT	NOV	DEC
2015	1.3	12.3	0	19.7	173.9	263.5	831.1	489.2	556.1	251.9	56.7	0
2016	0	0	0	0.2	79	146.5	106.5	350.9	374.2	386.5	7.3	21.4
2017	2	1.7	17.3	35	176	352	940.3	1219.3	754.3	258.7	104.3	8
2018	3.3	3	13	20.7	34.3	290.3	691	548.3	588.3	285.4	115.2	14.4
2019	0	0	14.4	18.6	97.3	332.8	686.4	927.9	216.2	107	49	0
2020	0	0	0	54	125.2	156	867.8	1029.6	178	307.5	56.6	0

5.4 Geology and Soils

According to Odell et al. (1974), the Peninsula Mountains, located near Freetown, are the result of a large basic intrusive body of gabbro, probably of the Precambrian age. The current topography is young, with a severely dissected mountain range rising above to almost 3,000 feet (900 m), is the result of a relatively recent uplift, possibly in Tertiary time. Several platforms have been carved into the mountain mass. Near the base of the mountains, several raised beaches are present that are part of the coastal plain. The coastal plain is a strip about 25 miles (40 km) wide adjoining the coast and parallel to it. Most of it is less than 50 feet (15 m) above sea level. It is built up of marine, deltaic, and fluvial deposits of the Bullom Series (Pleistocene or Recent). The topography is nearly flat, with many swamps. The coastal plain may be subdivided into sandy beach ridges and lagoons, mangrove swamps, alluvial grassland floodplains, and raised beaches and coastal terraces.

The British Geological Survey asserts that the lowland area in the west of Sierra Leone is dominated by strongly weathered ferral soils with low nutrient levels. According to Leipzig (1996), The mangrove swamp area extends along the coast, where tidal action causes an overflow of seawater at high tide and the draining of the area at low tide. During the dry season, the soil becomes very acidic through the oxidation of sulphides.

The topsoil, though only 10 - 30 cm deep, contains nutrients, minerals, seed, and organic matter (organic carbon) and support the forest vegetation and protect the subsoil from erosion.

Soil pH affects the number of nutrients and compounds that are soluble in soil water, as well as the amount of nutrients available to plants, according to Queensland's Environment, Land, and Water Management Department. Some nutrients are more readily available in acidic environments, whereas others are more readily available in alkaline environments. Hence the soil pH is close to neutral. However, most mineral nutrients are readily available to plants. Plant growth can be hampered by strongly acidic soils (pH less than 5.5) due to one or more of the following causes:

- Toxicity of Aluminium
- Toxicity of Manganese
- Deficiency of Calcium
- Deficiency Magnesium
- Plant nutrients such as phosphorus and molybdenum are in short supply.

In alkaline soils, nutrient shortages such as zinc, copper, boron, and manganese may be an issue. High quantities of sodium are likely to be found in soils with a very alkaline pH (>9). Between 5.5 and 7.5 is the ideal pH range for soil.

Nitrogen helps produce chlorophyll which assists plants to photosynthesize. A lack of nitrogen will produce very weak, fragile plants that don't grow to their potential. Nitrogen-deficient plants have small leaves, tiny stems, and short roots that might not be strong enough to support the plant overall. High nitrogen in the soil may lead to pollution of groundwater and downstream water bodies. The degree of soil nitrogen delivery that best balances the benefits and dangers, according to Carson (2022), varies based on the clay percentage of the soil. A "Moderate" soil nitrogen supply (25-50 mg-N/kg soil) achieves the optimal equilibrium in sandy soils. In contrast, "High" soil nitrogen supply (50 - 75 and 75 - 125 mg-N/kg soil, respectively) is best for loam and clay soils. Plants that lack enough phosphorus have spindly, thin-stems that are weak. Their growth is stunted or shortened, and their older leaves turn a dark bluish-green. The ability of phosphorus-deficient plants to produce seeds, flowers, and fruits is diminished. Soils with high phosphorus will contaminate downstream water bodies with nutrient pollution. The recommended phosphorus range in the soil is 30 - 50 mg/kg

Table 10 shows the baseline values of the physical and chemical properties of soils in the York and Tombo proposed primary substation sites.

Table 10: Soil Test Results

Item	Soil Property	UTM Coordinates			
		SS-Y1	SS-Y2	SS-T1	SS-T2
		E 701799.29 N 916818.85	E 701802.86 N 916935.28	E 709659.90 N 909507.79	E 709646.12 N 909554.83
1	pH (H2O)	4.8	4.4	4.9	4.5
2	pH (KCl)	4.2	3.9	3.9	3.4
3	Organic C (%)	1.4	1.1	0.9	0.7
4	Electrical Conductivity (µS/cm)	34	56	32	41
5	Particle Size analysis	-	-	-	-
	- Sand (%)	74	70	72	70
	- Silt (%)	9	10	8	12
	- Clay (%)	17	20	20	18
	- Texture	Sandy Loam	Sandy clay Loam	Sandy clay Loam	Sandy Loam
6	Total Nitrogen (%)	0.5	0.2	0.8	0.6
7	Total Phosphorus (mg/kg)	5.3	3.3	4.5	3.5
8	Available Potassium (kg/ha)	12.1	10.1	12.3	11.4

5.5 Ecology

The general climate and vegetation of Sierra Leone is primarily dependent on the biogeography location of the country in west tropical Africa. The climate determines the influence of two broad categories of biomes: (i) the Sudan Guinea Savanna, which is found associated with the northern part of the country; and (ii) the Guinea-Congo Forest biome, which occupies much of the south and is characterised by closed forest environments. Between these two broad biomes is a transition zone that has a mixed component of forest/savannah mosaic in places. The savannah zones have a diversity of mixed savanna vegetation from grassland to wooded grasslands and woodlands, while the closed forest zones are now dominated by secondary regrowth and patches of closed forest, mainly in the northeast to southeast of the country. A large proportion of the secondary regrowth is farm bush at various stages of regeneration, necessitated by the widespread slash-and-burn agriculture system in the country. Over the past century, the original continuous forest

cover has been fragmented into a mosaic of forest, bush fallows, cleared land and human settlements. Currently, the larger forest tracks are now isolated into effective islands, mainly concentrated in the north-northwest and central-southwest of the country. One of the most isolated tracts of the closed forest is the WAPNP. There are various settlements where the proposed distribution of electricity will be extended. The WAPNP supports two major reservoirs, the Guma Valley and Congo Dams, which are the major sources of water supply to Freetown and other settlements around the peninsula.

Biodiversity – Flora, and Fauna

Based on a survey by Karim et al (2013), covering only 1.5% of the actual plots surveyed and about 30% relative plots total coverage, the WAPNP is considered to hold a significant level of biodiversity across many taxa. A total of 128 species of trees (dbh ≥ 5cm) belonging to 33 families were recorded, with the Leguminosae family with the most species - (28) followed by *Euphorbiaceae* (14) and *Rubiaceae* (12). The diversity index of tree species calculated for the entire WAPNP area is 3.6, indicating that the park's overall diversity is appreciably high. The lowest diversity was around Kent and the highest was around Kossoh Town. The quantitative characters such as density, dominance and diversity of trees were assessed and these act as indicators of changes and susceptibility to anthropogenic stressors on the WAPNP. The frequency distribution of tree species observed suggests that a good number of them have high frequency, as would be expected in conventional species-abundance distributions.

Based on a number of reported studies and actual surveys (Okoni-Williams 2005, Tacugama, 2008) over 30 mammalian species have been discovered in the WAPNP. Among these species are seven species are primates, three of which are threatened Western chimpanzee (EN), Black and white *colobus* monkey (VU), *Sooty mangabey* *Cercocebus atys* Jentink's duiker *Cephalophus jentinki* (VU), Black duiker *Cephalophus niger* (NT) and Maxwell duiker *Philantomba maxwellii* (NT). There is anecdotal evidence from calls that the Red Colobus Monkey *Procolobus badius* (VU) may still be present in the WAPNP, but this is yet to be confirmed. The Diana Monkey *Cercopithecus diama* (EN) has not been seen for decades now, and so it is certain that it is now extinct in the reserve; none of these species were captured in a 2018 camera trapping exercise. Leopard is still listed among big mammals that occur in the WAPNP, but from anecdotal evidence the last male individual was killed by local hunters over a three decades ago. Small mammals do occur including bats and they include White-bellied *Pangolin* *Phataginus tricuspis* Cane rat *Thryonomys swinderianus* and

Brush-tailed Purcupine *Artherurus africanus*. Weber (2017) found out that the intake tunnel and tower of the Guma Dam provides suitable roosting habitat for a colony of the bat *Hipposideros ruber* (Family: *Hipposideridae*), comprising 30-50 individuals during the study period.

The WAPNP holds a reasonable diversity of avifauna. A total of 374 species of birds of 59 families were recorded prior to its designation as Important Bird Areas (IBA) (Okoni-Williams et al. 2005). A study by Karim et al. (2013) recorded 163 species belonging to 33 avian families recorded within the study period. Five International Union for Conservation of Nature (IUCN) Red-List species have been recorded so far: Hooded Vulture *Necrosyrtes monochas*, White-necked *Picathartes gymnocephalus* (VU), Green-tailed *Bristlebill Bledia eximia* (VU), Yellow-casqued Hornbill *Ceratogymna elata* (VU) and Rufous-winged *Illadopsis rufescens* (NT). John Obey, Whale Bay and No.2 River sites registered higher number of butterfly species. These areas had relatively good forest patches that support butterflies. The Butterfly *Cyrestis Camillus* was found only at John Obey site. *Danaus chryssippus* was found in almost all the sampling sites. Hamilton, Kossoh Town and Regent registered lower number of butterfly species because these sites fell in highly degraded areas. The survey encountered two butterfly species – *Euphaedra hastiri* and *Euphaedra afzelli* which are endemic to the Mano River Region (Liberia, Sierra Leone and Guinea).

The herp diversity in the WAPNP is quite good compared to many other locations where herpetological data have been collected in the country. The most comprehensive survey of herps was done by Reptile and Amphibians Programme, Sierra Leone (RAP-SL) in 2014, which covered 15 sites distributed around the park. During the survey period, 48 species of Reptiles and 41 species of Amphibians were recorded. Of the 41 amphibians, 11 are of conservation concern according to IUCN Red List of Threatened Species (2021), and they include one Endangered (*Hylarana occidentalis*, one Vulnerable (*Hyperolius torrentis*) and one Near Threatened species (*Arthrolepis 6Iurcole*). There are also four Data Deficient species (*Arthrolepis formosus*, *Ptychadena arnei*, *Ptychadena submascareniensis* and *Arthrolepis formosus*) and two unspecified species including the *Arthrolepis* and *Ptychadena* species. Only three forest-dependent species including *Conraua alleni*, *Phrynobatrachidae* species, *Hylarana albolabris*, *Hylarana occidentalis* and the *Amietophrynus togoensis* were recorded at the site. The few records of forest-dependent or leaf litter species, including the *Phrynobatrachidae* and the *Arthroleptidae*, indicate that the WAPNP is facing serious anthropogenic threats.

In terms of reptiles, 48 species have been recorded from the different taxonomic classes and orders in the WAPNP; three species are of conservation concern according to IUCN (2021).

One vulnerable crocodile species (*Dwarf crocodile Osteolemus tetrapis*), and one vulnerable turtle (Senegal flat-shell turtle *Cyclanorbis senegalensis*). The beaches along the coastal strip also support six species of marine turtles all of which are globally threatened: three Critically Endangered *Dermochelys coriacea*, *Eretmochelys imbricata* and *Hemidactylus kundae*), three Endangered species (*Caretta*, *Chelonia mydas* and *Lepidochelys olivacea*).

In more recent times, reduction in the forest cover around the WAPNP has been accelerated by land development, road construction, logging exploitation all around the peninsula. Vast areas of forest buffers and to some extent, core areas within the forest reserve, have been cleared for settlement establishment, perpetrated by land grabbers and poor land administration within government circles. There are many settlements around the peninsula, but the most populated ones include Tombo (a fishing town on the southernmost end of the peninsula) and Goderich (now an extended coastal settlement on the mid-northern section of the peninsula). Between these settlements is an increasing extension of housing construction along the main road and associated branches throughout the entire stretch of the peninsula. These activities have led to clearing significant portions of the forest, including the No. 2 Forest Reserve Buffer, the Tokeh Forest Reserve Buffer, and the Kent Extension Forest. All of these forest reserves are components of the WAPNP. The effect of such levels of deforestation, which seems unabated, is the reduction in viable habitats for species, loss of biodiversity, loss of freshwater resources and decline in carbon sequestration capacity of the forest.

The survey's main objective is to provide baseline ecological and biological information on the areas to be involved in the proposed extension of the distribution capacity of EDSA in the areas covered during the survey. The result of the survey will feed into the assessment of the impacts of the Project on relevant ecological systems and in the design and implementation of mitigation measures during the operation of the Project.

A transect walk was undertaken along the proposed route where stops were made to record sensitive ecological components. This ecological survey was carried out in 70 locations. The extent of the survey covered the following areas within the specified locations:

- i. Areas within the immediate surroundings of the proposed distribution line route and primary substations.
- ii. Areas with 500m radius of the Project sites, including all landscape features: human settlement, forest, farm bush, swamps, and bridges any species or ecology of interest.

Four key thematic areas constituted this ecological assessment, which are considered as appropriate indicators of environmental health.

- Vegetation and botanic assessment
- Mammals
- Birds
- Herps (reptiles and amphibians)

5.5.1 Vegetation and Plant Composition

The survey was conducted to assess the botanical characteristics of the sites to be involved in the implementation and operation of the electrical distribution line Project. *Table 11* shows the names and locations of the sites visited; these are consistent with the sites where the birds, mammals, and herpetological surveys were conducted.

Table 11: Locations of Sites surveyed for vegetation and botanic assessment

Start Point	Eastings	Northings	Dominant Vegetation
Waterloo – Mammah Beach axis (Site 1)			
Benguema	711913	919394	Elephants grass mix with stands of Mango indica, mix with spares wild palm along the stream and Baboon cane forest patches.
Benguema	712018	919235	Stands of Mango indica mix with spares wild palm along the stream and Baboon cane forest patches. Swampy.
Middle Town	711437	916939	Degraded farm bush dominated with <i>Chromolaena odorata</i> species and sparse wild palm.
Middle Town	711529	916939	Swamp looks inland valley dominated with cassava plant and vegetable gardens.
Macdonald	711423	915564	Stream alongside with patches of gallery forest, degraded farm bush
Macdonald	711531	915504	Inland valley swamp stream spares gallery patches, spares wild palm mix with elephant grass and <i>Chromolaena odorata</i> plant.
During Town	711133	912243	Degraded farm bush, grassland hilly forest patches and open stands of wild palm
During Town	711018	912274	Degraded farm bush, hilly forest gallery patches with invasive species plant <i>Chromolaena odorata</i> at the edges.

Start Point	Eastings	Northings	Dominant Vegetation
Madina Town	710071	909788	Open areas grassland highly degraded rocky boulders
Madina Town	710171	909727	Stream along the bridge inland valley canopy forest trees.
Tombo Town End - Point	709259	908494	Spares of acacias and <i>mango indica</i> another forest human settlements and house construction.
Kissy Town	708239	907547	Degraded farm bush stands of wild palm and mix species plant <i>Gmeliana aborea</i> , and mango <i>Mangifera indica</i> , and hilly patches of forest.
Kissy Town	708141	907213	Degraded farm bush, elephant grass <i>Panicum maximum</i> dominated vegetation and patches of Acacia and Parkia trees.
Mammah Beach Quarry	705959	907564	Degraded farm bush, grassland hilly forest patches, and open stands of wild palm.
Kent – York axis (Site 2)			
Kent area	704188	908208	Degraded forest on the hilly side (part of the WAPNP and shrubby and grassy vegetation on the seaside.
John Obey	704660	909419	Degraded farm bush, hilly forest gallery patches with invasive species plant <i>Chromolaena odorata</i> at the edges.
John Obey	704433	909366	Open dry areas grassland burnt towards the Atlantic Ocean
John Obey	703505	911798	Stream rocky boulders and gallery forest with different species of plant.
Black Johnson	703015	915345	Degraded farm bush dominated with <i>Chromolaena odorata</i> species plant and mix with open stands of wild palm.
York	701337	916772	Open environment flat grassland area, degraded farm bush along hilly patches of forest and stands of wild palm.
Tokeh	700247	918823	Stream inland valley swamp, hilly degraded farm bushes dominated grassland.
Tokeh	700534	918756	Degraded farm bush clearing areas grassland and hilly forest patches.
Tokeh - Sussex Farm axis (Site 3)			

Start Point	Eastings	Northings	Dominant Vegetation
Banga Farm (Sussex)	694732	924573	Hilly environment mango <i>Mangifera indica</i> , Cashew nut, pawpaw <i>Carica papaya</i> and Banana plants.
Borbor Community	696586	922586	Hilly environment mango <i>Mangifera indica</i> , Cashew nut, pawpaw <i>Carica Papaya</i> and banana <i>Musa sapientum</i> plants. Degraded farm bush and forest.
No. 2 Biobaray Guma Trail	700068	923628	Degraded farms bush with few patches of gallery forest housing construction.
No 2 Biobaray Guma Trail	700058	922909	Degraded farm bush few patches of gallery forest housing construction
Grass field Tokeh	699998	921146	Degraded farm bush, grassland hilly forest patches, and human settlement.
Tokeh Junction End - Point	699561	919849	Degraded farm bush, hilly forest gallery patches with invasive species plant <i>Chromolaena</i> at the edges.

The survey methods applied here are consistent with a rapid assessment, which mainly involves the determination of vegetation types and distribution from observations in and around specific locations distribution of the Project distribution line route and along defined transects running through main habitat types in the environs of the proposed site, respectively. The broad vegetation categories encountered in the Project area were classified based on the biogeography representation of the country and/or sub-region (see Cole, 1978). The recorded plant species were checked for conservation status by referring to the IUCN Red List (2021) and by considering their regional distribution.

5.5.2 Mammals and Birds

The survey sites for mammals and birds were consistent with the sites visited for vegetation and botanic assessment, as given in *Table 11*. Data on mammals were obtained mainly through interviews with local people and hunters and visual evidence, such as faecal droppings, footprints, and nesting sites. At least two to five people, including hunters and farmers, were interviewed in each of the adjacent settlements associated with the Project area. Some degree of triangulation was done to give credence to the information provided by the respondents. A field guide to mammals of Africa (Kingdom 997) and birds of West Africa (Borrow and Demey 2014) were reference material used mainly to show pictures to respondents of mammals that possibly occur in the area. The recorded mammal and bird

species were checked for conservation status by referring to the IUCN Red List (2021) and by considering their regional distribution and abundance (e.g., asking local informants whether those species are confined to the Project area or they also exist in other places).

5.5.3 Herps (Reptiles and Amphibians)

Herps were surveyed using some of the standard methods in rapid assessment of their diversity and distribution. An extensive search was the primary method employed whereby known and suspected habitats were checked by lifting small rocks and clearing leaf litter where amphibians usually hide. A general examination of relevant habitats and interviews with local people were used to assess the diversity of snakes on both sides of the road corridor and proposed primary substation sites at York and Tombo.

5.5.4 Results and Discussion

1. Vegetation and Botanic assessment

The descriptions and photos shown below give a general landscape view of the sites, including the specific site features for the distribution line. The general view of the landscape is that of a mosaic of various states of vegetation and the components that influence the ecology. Much of the mosaic is human settlement surrounded by various degrees of vegetation degradation and regrowth, under different regimes of human influence such as agriculture, housing construction and settlement expansion.

Out of the 70 sites visited, the vegetation of 15 sites can generally be described as having a similar plant distribution and physiognomy because they seem to be influenced by similar environmental and anthropogenic factors, except for a few differences at Mammah Beach and Tokeh community where there are signs of forest. Each of the sites proposed for the electricity distribution line Project is surrounded by human settlements depending on the area, to a greater or lesser extent. Away from the sites are a variety of vegetation ranging from farm bush fallows, grasslands and closed forests, but no sacred groves were observed. In all rural communities survey, no sacred grooves were encountered, although it's a component of the traditional and cultural practices of the people. They are usually found in close association with the settlement and a vital symbol of traditional authority and control. The tradition, which is generic to all sites surveyed, do not allow entry of any individual who do not belong to the secret society managed these sites to enter and/or take anything from the site. Permission to enter can only be given through the traditional authority after the performance of certain cultural rights

Specific Site Characteristics

Waterloo – Mammah Beach Axis (Site 1)

This site mainly comprises open grassy areas of species *Panicum maxima*, with the few stands of trees along the road dominated by economic trees such as mangos *Mangifera indica*, pawpaw *Carica papaya*, wild oil palm *Elaeis guineensis* and Banana *Musa sapientum*. Most of these fruit trees, especially mangoes occur in private properties along the main road. The vegetation in areas 500 m on the seaside end of the main road similar to that near to the road, but towards the forest, there was a relatively higher tree densities of some of some timber species including *Melicia regia*, *Azelia africana*, *Gmelina arborea*, *Parkia biglobosa* and *Anisophyllea laurina*. There were also patches of elephant grass *Panicum maxima* on either side of the road, with few stands of wild oil palm *Elaeis guineensis*, and Acacias trees. The nature of the vegetation could suggest that it has been derived from a long history of slash-and-burn farming which may have degraded the soil leading to the pre-dominance of degradation tolerant trees and grasses. An inland valley swamp was encountered at Benguema, where the local people are engaged in vegetable gardening. Two quarries (Mammah beach and Kerry Town) were encountered on the forest end of the road with vegetation mainly comprising elephant grass and *Anisophyllea laurina*.



Kent – Tokeh Axis (Site 2)

This stretch of the site has a vegetation characteristic similar to all others, particularly on the seaside end of the main road. The vegetation from the road to about 500 metres is generally open and shrubby in places, mainly comprising elephant grass and *Anisophyllea laurina*. On the side of the forest, the vegetation tends to be more forested than the Waterloo – Mammah Beach axis, with patches of degraded forest in places. However, these patches are being further fragmented by land acquisition for housing. Thus, the area is inundated by cleared land on the fringes of the forest and unfinished buildings, even in locations that are apparently contiguous with the core peninsula forest. The remnant tree stands include *Anisophyllea laurina*, *Daniella thurifera*, *Amphimas pterocarpoides* *Terminalia ivorensis*, *Herritiera utilis* and *Phyllanthus descoides*. Two major streams traverse this axis of the main road; the John Obey Stream and the Big Water Stream, which are major sources of water for domestic and other uses by the local communities. Other smaller streams occur and serve the same purpose, but at the time of visit, which most of the smaller streams were dried up.



No. 2 River – Sussex Axis (Site 3)

The vegetation in this axis has similar features characteristic of the landscape that seems to be common to the entire western area peninsula. The vegetation on the forest end of the road comprises widespread degraded portions of the WAPNP with remnant tree stands of species *Antisophyllea laurina*, *Daniella thurifera*, *Amphimas pterocarpoides* *Neu-tonia* *sp Terminalia* *ivorense* and *Phyllanthus descoides*. The degradation is associated with the acquisition of land for housing development that has been observed all around the buffer zones of the park. This is particularly evident in the No. 2 River to Tokeh area. Much of the landscape comprises open areas, ongoing building construction, grasses *Andropogon gabonensis* and *Panicum maximum* in places and scattered stands of wild oil palm *E. guineensis*. On the seaside end of the road, the landscape is associated with more built-up settlements, business and fruit trees of various species (mango, pawpaw, banana etc) in private properties. The fruit trees on the forest end of the road are of similar diversity along both ends of the road. The terrain in this axis is relatively more hilly closer to the road than the two other axes described previously.



Location of Substations

A. York Substation

The York substation is located on a laterite pan and so the resident vegetation is grassland dominated by the species *Pennisetum subangustum* interspersed by *Chromolaena odoratum*. The surrounding vegetation is forest on the remote end of the grass field and sparse stands of shrubs, mainly *Premna hispida*, *Antisophyllea laurina*, *Phyllocosmos africanus* and *Spondias mombin*. Adjacent to the open grass field are land



spaces that have been acquired for housing development. On the seaside end of the road, shrubby vegetation dominates, with *A. laurina* and *Alchornea cordifolia* being the most common plant species.

B. Tombo Substation

The Tombo substation is located at an open field surrounded by houses at various stages of construction. The area is apparently a relatively new extension of the Tombo town (towards the WAPNP), where the vegetation has been completed decimated and much of the land is exposed loamy soil. Adjacent areas are full of mango *Mangifera indica* trees and some stands of *Gmelina arborea*. There is a small stream running within 50 metres of the site and appears to be drying up due to the dry season and the spate of deforestation that characterise the once forested periphery of the WAPNP.



C. Ecological Assessment of Three Points Located on the Core Areas of the WAPNP

Three GPS points were taken as reference points on the core areas of the WAPNP. All the three points are located over 3 km from the nearest proposed distribution line corridor and have closed-canopy high forest, have very similar plant physiognomy and community character based on observations during the rapid assessment of these locations. 20m x 20m quadrat was taken at each location to assess tree diversity and density. Birds were recorded, but no observation was made of herps. Plant, mammals, and birds are adequate indicators of the biodiversity status of the sites. Observations focused on global conservation species and were listed in the IUCN Red List (2021). **Table 12** shows the GPS data of the sites visited in the WAPNP.

Table 12: GPS Data of Points Visited in the WAPNP

Sample Points	Eastings	Northings	GPS Elevation	Nearest settlements	Distance from the nearest settlement (km)
WAPNP 1	706860.76	912643.72	710	John Obey	3.29

WAPNP 2	703412.08	919706.73	398	Tokeh	3.17
WAPNP 3	696429.05	929076.35	702	Mambo	3.83

Across all three locations, a total of 53 species of trees with diameter at breast height (dbh) ≥ 10 cm were observed. The most common species were *Xylopia quintassi*, *Daniella thurifera*, *Chlorophora excelsa* and *Terminalia ivorensis* in descending order. The tree species composition was found to be very similar for all the 20m x 20m samples taken across all sites. Among the tree species were IUCN Red List species as follows: *Heritiera utilis*, *Azalia africana*, *Terminalia ivorensis* and *Milicia regia*, all of which are considered vulnerable and were recorded at different locations along the edge of the forest adjacent to the proposed transmission corridor. A previous study in 2012 by Karim et al. (2013) recorded a total of 128 species of trees (dbh ≥ 5 cm) belonging to 33 families, with the forest adjacent to Hamilton and No 2 River village, showing the highest local species endemism, with nine and eight species, respectively recorded only in those two sites.

Other species of trees observed, which are targets for fuel wood and timber include *Musanga cercropoides*, *Albizia adianthifolia*, *Anthocleista nobilis*, *Erythrina senegalensis*, *Phyllanthus discoidens*, *Fagora macrophylla*, *Chlorophora regia*, *Amphimas pterocarpoides*, *Lophira alata*, *Diadium guineensis*, *Uapaca guineensis* and *Anisophyllea laurina*. The frequency distribution of tree species observed suggests that a good number of them have high frequencies of occurrence as would be expected in typical species-abundance distributions. The tree density was estimated as 410 trees per ha and the tree canopy estimated to be about 73%, which are good indicators that these core forest locations have experience relatively low levels of disturbance.

During the visit, there were no direct evidence of the presence of mammals, but a couple of footprints and faecal matter of duikers (*Maxwell Duiker Philantomba maxwellii*) were observed, whilst evidence of an old nest site for chimpanzees was also observed at the vicinity of WAPNP 2. Three species of birds of global conservation importance were encountered – Yellow-casqued Hornbill (VU), Green-tailed *Bristlebill Bleda eximia* and Rufous-winged *Illadopsis illadopsis refescens* (NT), whilst one Upper-Guinea endemic was recorded – *Sharpe's Apalis Apalis sharpeii*.

The observations made during the visit to these core forest areas in the WAPNP indicate a very impressive plant community that supports a variety of fauna, including mammals and birds. These areas could be regarded as pristine or near pristine and are virtually remote from anthropogenic disturbance. Thus, with respect to the proposed installation of the

electric distribution line, there is virtually no direct impact on the core peninsula forest of the WAPNP, which is unconnected with the distance and toughness of the topography of the core areas.

Botanic Characteristics

The survey recorded a total of 119 species of plants belonging to 54 families (**Table 13; Annex iii**). The Kent-Tokeh corridor (Site 2) was the most diverse in terms of plant species richness, with 106 species (89.1% of the total), closely followed by (Site 3) with 91 species (76.5% of the total). Site 2 and Site 3 have relatively higher vegetation cover than Site 1, which only had 65 species (54.6% of the total). The most common forest tree species across all sites were *Anisophyllea laurina*, *Daniella thurifera*, *Amphimas pterocarpoides*, *Terminalia ivorensis*, *Heritiera utilis* and *Phyllanthus discoides*. Grasses of the species *Panicum laxium*, *Andropogon gabonensis* and *Pennisetum purpureum* dominated most of the degraded portions of the landscape on the seaside end of the road and in places along the forest end.

Four species of trees recorded are in the IUCN Red List (2021) as vulnerable (VU); *Heritiera utilis*, *Azalia africana*, *Terminalia ivorensis* and *Milicia regia*. However, only a few stands of these threatened species were recorded in locations that had some fragments of closed forest in almost all of the sites surveyed. All of these threatened tree species are valuable timber species, which are exploited for various commercial and building purposes within and along the buffer zone of the park. Of the 119 species recorded, 31 species are used as food (26.1%), 12 species as timber (10.1%), 55 used as medicinal herbs (46.2%), 6 species used as fuel wood (5.0%) and 17 used for various domestic and artisanal utility (14.3%) (**Table 13**). The data shows that a significant proportion of the plants are used as medicine and food, indicating clearly that the local people depend on the plant resources along the road. Most of these species occur in abundance in core forest zones.

Table 13: Botanic categories of plant species recorded during the survey

Botanic categories	Site 1	Site 2	Site 3	Total
No. of Species	65	106	91	119
No. of Families	32	51	43	54
IUCN Red List species (VU)	1	3	2	4
No. used as food	31	31	31	31
No. used as timber	12	12	12	12
No. for domestic uses	17	16	15	17

could be attributed to the spate of deforestation of the forest buffers and the other side of the road, mainly for housing development. Buffer zones and roadside vegetation are very important refugia for small mammals and crossing point for large foraging mammals. However, local respondents indicated that there are occasional encounter of Maxwell's Duikers *Cephalopus maxwelli* and Green Monkeys *Chlorocebus sabaeus* that the White-bellied Pangolin was caught around September 2021 at the edge of the forest at No. 2 River.

B. Birds

99 species of birds belonging to 44 avian families were recorded across the three axes of the seventy sites surveyed (**Table 11; Annex iv**). Most of the species recorded were resident and ubiquitous (97.4%) and there is a high degree of similarity in the diversity birds among the sites, except in a particular species. For example, two globally threatened species were recorded in two different set of sites as follows: **Hooded Vulture** *Necrosyrtes monochas* (CR) (recorded at the Waterloo-Mammah Beach axis) and Yellow-casqued Hornbill *Ceratogymna elata* (VU) recorded at the Kent-Tokeh axis (see Birdlife 2022). *N. monochas* was sighted at GPS (28P) 711423 E & 915564 N, whilst *C. elata* was sighted at GPS (28P) 703015 E & 915345 N). Of the birds recorded 20 species belong to the Guinea-Congo Forest biome assemblage (18% of the 174 species known for Sierra Leone) and two was of the Sudan-Guinea savannah biome assemblage. Only three migratory species were recorded: one species of Afro-tropical migrants and two species of Palaearctic migrants.

Table 15 provides detailed data on the distribution of species recorded into various thematic and biogeography categories. In effect, there are limited chances of encountering savannah-dependent species. However, based on observation and the data generated, the road corridor being examined in this survey does not have a high and significant diversity of avifauna compared to the core protected area of the WAPNP. The No 2 River-Sussex (Site 3) had the most diverse avifauna and accounted for one globally threatened species (Hooded Vulture). The proportion of species in all categories that were recorded along the road corridor was much less than those in the core areas of the park; but two of the six globally threatened species were recorded during this survey. There was a significantly low proportion of forest-dependent species (Guinea-Congo Forest biome species) that were encountered, and this is due to the fact that much of the forest cover along the survey corridor have been degraded and so the forest edge habitats for these birds have been virtually obliterated.

2. Fauna (mammals, birds and herps)

A. Mammals

A total of 9 species of mammals was recorded through interviews, signs and visual evidence across the three axes visited along the peninsula road corridor. All species listed were recorded along the edges of the forest side of the road, whilst only giant pouch rat and the striped ground squirrel were recorded on the other side of the road. These include one primate species and small mammals; of particular interest is the White-bellied Pangolin *Phataginus tricuspis*, which is considered as endangered (EN) by the IUCN (2021). The common species of interest is the March Cane Rat *Thryonomys swinderianus*, which is a delicacy among local people and is usually trapped to reduce its effect on crops as a well-known pest; it is also hunted for subsistence income. **Table 14** gives a full list of the mammals identified by the local people to be present in the respective sites and their IUCN conservation status. All through the Project corridor, no chimpanzee or signs of their presence or use of the forest edges was observed. Residents that are conversant with the forest ecology commented that chimps could only be seen in a location deep into the forest.

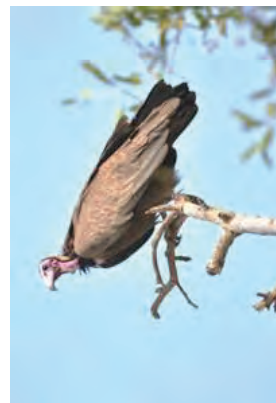
Table 14: Mammal species recorded by visual evidence or through

Species	Scientific name	IUCN Status	Site 1	Site 2	Site 3
Green Monkey	<i>Chlorocebus sabaeus</i>	LC		x	
Maxwell's Duiker	<i>Cephalophus maxwelli</i>	LC		x	x
White-bellied Pangolin	<i>Phataginus tricuspis</i>	EN		x	
Marsh Cane-rat	<i>Thryonomys swinderianus</i>	LC		x	x
Giant Pouch rat	<i>Crecitomyis emimi</i>	LC		x	x
African Civet	<i>Civettictis civetta</i>	LC			x
Striped ground squirrel	<i>Atlantoxerus getulus</i>	LC		x	x
Fire-footed rope squirrel	<i>Funisciurus pyropus</i>	LC		x	x
Slender mongoose	<i>Herpestes anguinea</i>	LC		x	x

Most of the mammal species recorded by visual evidence or interviews are presumed to be in decline in terms of their occurrence within the 500 m range on either side of the Peninsula Road corridor. From observation and anecdotal information, the rarity of mammalian fauna

Table 15: Biogeographic and Diversity Information about Bird Species Recorded

Species Category	Site 1	Site 2	Site 3	All axes	WAPNP	% of WAPNP
Number of species	91	94	93	99	374	26.5
Number of families	22	26	26	31	58	63.7
Resident species	82	83	84	84	327	25.6
Afrotropical migrants	5	6	6	7	19	36.8
Palaearctic migrants	1	1	1	2	28	7.1
GC biome spp	14	20	17	20	91	21.9
UGF endemic spp	0	0	0	0	0	0
SG Savanna biome spp	0	0	0	1	5	20.0
IUCN Threat status Total	1	0	1	2	6	33.3
Critically Endangered (CR)	0	0	1	1	1	100.0
Endangered (EN)	0	0	0	0	0	0
Vulnerable (VU)	1	0	0	1	2	50.0
Near Threatened (NT)	0	0	0	0	2	0



Hooded Vulture *Necrosyrtes monochas* (CR)

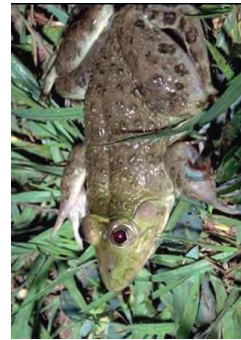


Yellow-casqued Hornbill *Ceratogymna elata*(VU)

3. Herpeto-fauna (Reptiles and Amphibians)

The herpetofauna recorded in the survey corridor comprises common species. 14 species of reptiles and amphibians were seen through the rapid search of suspected sites. No globally

threatened species of reptiles or amphibians were recorded. The WAPNP is known to hold a good diversity of herps, including 48 species of reptiles and 41 species of amphibians. The number of species recorded in this survey only represents 15.7% of the species known to the park. The number of amphibians recorded was five (5), and the low diversity is associated with the dry nature of the environment at the time and season of the survey. The most common species in the count was the African Common Frog *Sceloporphrys regularis*, which had a widespread distribution and was found in almost all streams and associated habitats throughout the survey corridor. The other species recorded are as follows: Broad-banded Grass Frog *Ptychoadena bibroni*, Sharp-nosed frog *Ptychoadena oxyrhynchus*, African Grove-crowned Frog, *Hoplobatrachus occipitalis* and *Ahl's River Frog Phrynobatrachus latifrons*. The number of reptile species recorded was nine (9) and the most common reptiles recorded were the African Lizard Agama africana and the Rainbow Lizard *Agama agama* which were observed in all habitats and sites visited. Other lizards included *Mabouya mabouya* and *Varanus niloticus*. Two species of snakes were observed in two different locations within the Kent-Tokeh axis – Green *Mamba Dendroaspis viridis* and Black *Mamba Dendroaspis polylepis*. Also, local respondents indicate a wide distribution of the African forest cobra *Naja melanoleuca* and Stripped House snake *Lamprophis lineatus*, and occasional encounter of Gaboon viper *Bitis gabonica*. Ecologically, all five species of snakes recorded are associated with human settlements, farm bush and forest edges, and so their foraging activities take them into closed quarters with human dwellings.



Hoplobatrachus occipitalis



Sceloporphrys regularis



Lamprophis lineatus



Dendroaspis viridiss

5.6 Noise

Noise levels and their impacts vary depending on the time of day, type of community, the age range of recipients, and existing regulations. The International Organization of Standards (ISO) claims that noise that gives rise to hearing impairment may come from open-air concerts, discotheques, motorsports, shooting ranges, in dwellings from loudspeakers, or leisure activities. Other significant sources of loud noise are headphones and toys and fireworks, which can emit impulse noise. The ISO standard 1999 asserts that long-term exposure to a 24-hour equivalent continuous sound levels (LAeq,24h) of up to 70 dB(A) will not impair hearing. Peak sound pressures should never exceed 140 dB and 120dB for adults and children, respectively in order to avoid hearing loss from impulse noise exposure, according to ISO 1999. Chronic exposure to noise during early childhood has been shown to impair reading acquisition and reduce motivational capabilities, and the longer the exposure, the greater the damage. Noise can induce annoyance depending on its physical characteristics and their variations with time. Few people become irritated by LAeq levels below 55 dB(A) during the day, and even fewer are mildly upset by LAeq levels below 50 dB(A) during the night (A). However, during the evening and night, sound levels are recommended to be 5–10 dB lower than during the day.

Noise in the community may interfere with rest, recreation, and quality family time. The research suggests that noise levels above 80 decibels (A) diminish helping behaviour and that loud noise enhances aggressive conduct in people who are inclined to it. High levels of chronic noise are also thought to contribute to schoolchildren's sense of powerlessness.

Sources of continuous noise in the Project area include intermittent traffic from vehicles, heavy equipment, bike riders, and aircraft. Noise is also received from schools and places

of worship at varying times during the day; lorry parks and market places also contribute to continuous noise in the communities within or near the Project area. Figure 5 shows results of 24-hour averages of noise measured at the designated sample locations in the Project site shown in Figure 6.

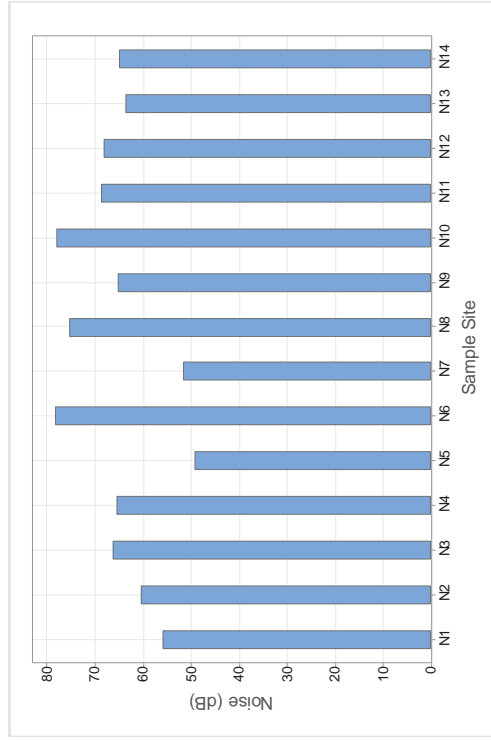


Figure 5: 24-hour Averages of Noise Levels at Sample Locations in the Project area.



Figure 7: Air Quality Monitoring (L-R Daytime and Nighttime)

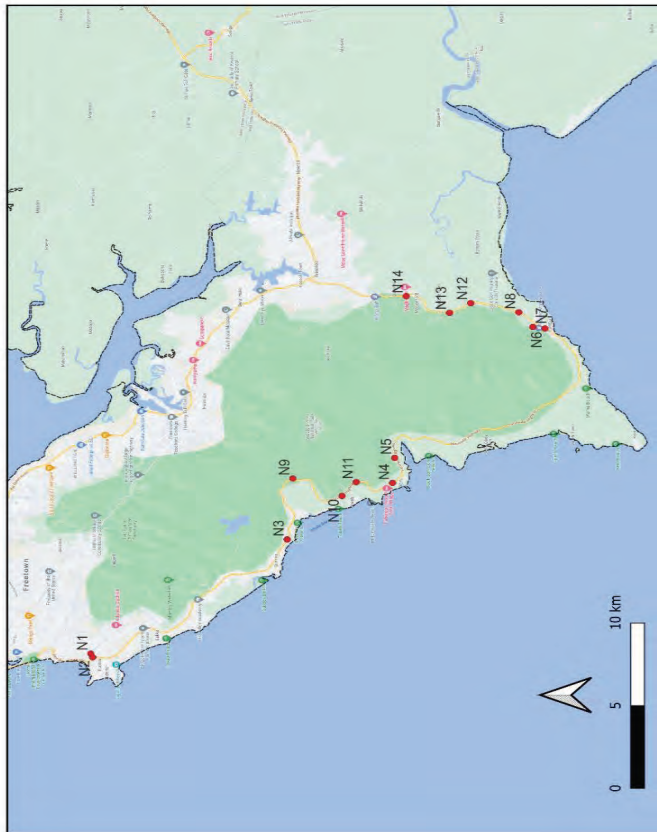


Figure 6: Noise Sampling Location (N1: Goderich Substation as background)

5.7 Air Quality

The background air quality values in this impact assessment are defined as the concentrations measured before the commencement of the Project activities. Fourteen (14) sample sites were selected to measure the concentrations of various air quality parameters. The key parameters measured include particulate matter (PM), ozone (O₃), Nitrogen dioxide (NO₂), Sulphur dioxide (SO₂), carbon monoxide (CO), air temperature, and percent relative humidity. Concentrations were measured every minute for 30 minutes in the morning, afternoon, and night respectively. These were computed into daily averages per site. **Table 16** shows the baseline values. Both noise and air quality baselines were collected at the same sites (ref **Figure 6**).

1. Particulate Matter (PM)

PM is commonly used as a proxy indicator of air pollution by the World Health Organization since it impacts more people than any other pollutant. It may represent most of the concerning air contaminants, including sulphate, nitrates, ammonia, sodium chloride, black carbon, and mineral dust. The WHO defines PM as a complex mixture of solid and liquid particles of organic and inorganic substances suspended in the air.

A PM with a diameter 10 microns or less, ($\leq PM_{10}$) can penetrate and lodge deep inside the lungs; a smaller diameter PM ($\leq PM_{2.5}$) can penetrate the lung barrier and enter the blood system. Chronic exposure to PM may lead to the risk of developing cardiovascular and respiratory diseases and lung cancer. The WHO recommended standards for PM_{10} are 15 $\mu\text{g}/\text{m}^3$ (ppb) for an annual average and 45 $\mu\text{g}/\text{m}^3$ (ppb) for a daily average. The recommended standards for $PM_{2.5}$ are 5 $\mu\text{g}/\text{m}^3$ for an annual average and 15 $\mu\text{g}/\text{m}^3$ (ppb) for a daily average. **Figure 8** shows the background concentrations of PM values at designated locations in the concession site. These values are based on daily averages.

Table 16: Air Quality Baseline

Sample	Sample Site	SO ₂ (ppb)	NO ₂ (ppb)	O ₃ (ppb)	CO (ppb)	PM _{2.5} (ppb)	PM ₁₀ (ppb)	TSP (ppb)	Temp _t (°C)	Humidity (%RH)	Wind Speed (m/s(D))	Wind Direction (°)
AQ1	Godertich Substation	232.55	38.71	31.67	0.87	30.73	94.74	151.01	35.50	40.20	1.20	155.74
AQ2	Delcon Primary School	291.51	41.37	40.78	0.86	36.68	124.27	198.10	34.34	49.92	1.87	163.96
AQ3	Bawbaw Park	284.83	85.14	11.02	1.05	32.82	72.49	108.96	27.59	75.23	0.87	222.63
AQ4	School	264.38	62.48	21.50	0.69	28.41	91.67	131.89	30.99	63.06	1.55	178.83
AQ5	York PSS	210.81	27.44	39.34	0.29	21.97	56.58	88.96	34.29	52.04	2.20	228.76
AQ6	Tombo Park	282.12	33.81	41.47	0.64	30.77	64.63	94.58	33.81	54.24	1.70	131.70
AQ7	Tombo PSS	261.68	40.43	31.09	0.63	31.48	118.74	194.22	31.31	56.81	1.27	117.27
AQ8	Buyor School	263.22	67.81	12.73	0.53	22.68	50.52	74.18	26.91	71.87	0.79	181.34
AQ9	Ng. 2 along main Road	264.15	57.61	17.05	0.67	18.91	59.70	96.58	31.83	59.93	1.15	132.59
AQ10	Tokeh junction	253.44	33.86	38.62	0.79	35.88	153.73	212.07	35.99	45.44	1.94	103.21
AQ11	Newly Built hospital at Tokeh	291.02	72.03	13.30	0.86	36.60	89.90	137.06	28.62	73.22	0.42	200.91
AQ12	During Town along main Road	201.76	9.72	34.28	0.70	30.88	86.18	131.63	34.59	40.27	1.10	236.51
AQ13	hospital at Kerry town	255.15	14.62	46.85	0.43	15.72	51.19	85.69	36.05	39.19	1.75	256.94
AQ14	Macondald along main Road	316.96	53.16	13.95	0.52	23.28	62.82	98.90	29.21	65.43	0.44	107.02

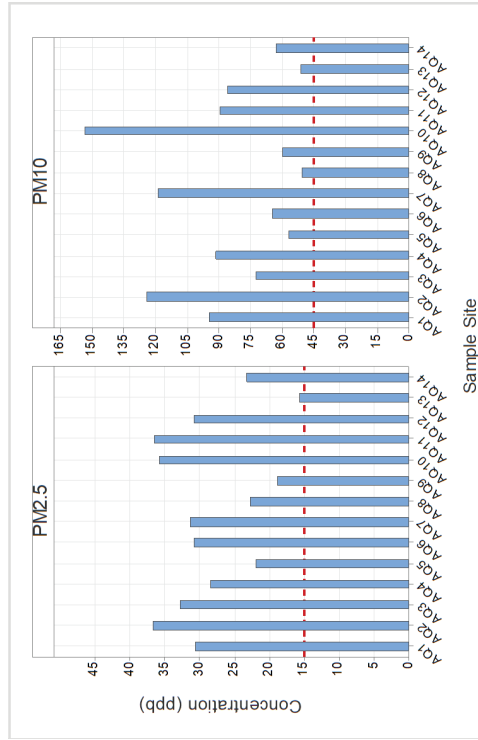


Figure 8: Particulate matter with diameters 2.5 μm and 10 μm ($PM_{2.5}$ and PM_{10}) at sample locations in the Project area. The concentrations are based on daily averages. The red line indicates the minimum contaminant threshold

For both the PM_{2.5} and PM₁₀, the daily averages exceeded the WHO recommended standards for all the sites. This implies that any additional emissions of PM_{2.5} and PM₁₀ may significantly impact people and ecosystems in the area.

2. Ozone (O₃)

Ozone at ground level is considered an air pollutant because it is one of the major constituents of photochemical smog. In abundant sunlight, pollutants such as nitrogen oxides (NO_x) from vehicles and industry and volatile organic compounds (VOCs) emitted by vehicles undergo photochemical reactions to produce O₃. According to the WHO, exposure to O₃ may cause breathing problems, trigger asthma, reduce lung function and cause lung diseases. The WHO recommends a daily maximum O₃ emission of 100 µg/m³ for 99% of 8-hour days in a year. *Figure 9* shows the daily averages of O₃ at the sample locations in the Project site. All of the readings are considerably below the specified maximum contamination level

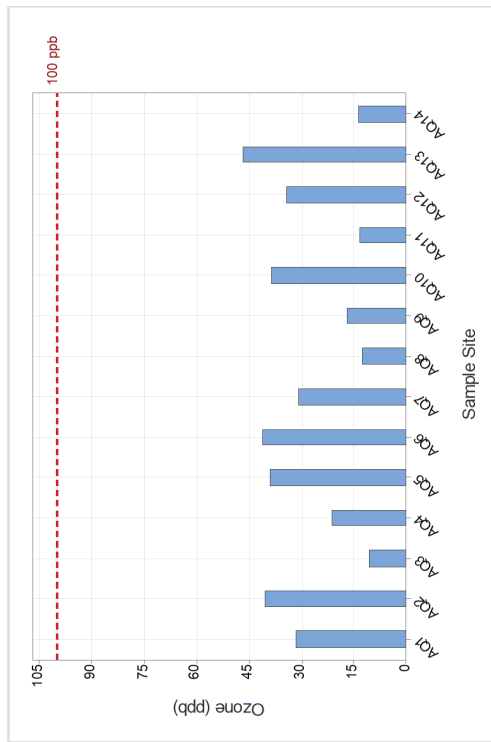


Figure 9: Ozone Concentrations at Sample Locations in the Project Area. The Concentrations are based on Daily Averages. The red line indicates the minimum contaminant threshold

3. Nitrogen dioxide (NO₂)

The major sources of NO₂ emissions by human activity are combustion processes (heating, power generation, and engines in vehicles and ships). According to the WHO, there is a direct relationship between symptoms of bronchitis in asthmatic children and exposure to NO₂ over a long period of time. NO₂ exposure has also been associated to a reduction in lung function growth. The WHO recommended standards are 10 µg/m³ as annual average and 25 µg/m³ as daily average. *Figure 10* shows the background concentrations of NO₂ at the sample sites in the concession area.

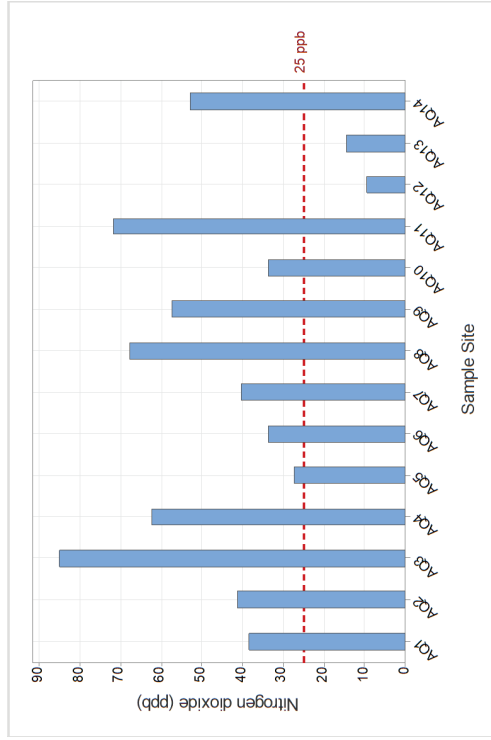


Figure 10: Nitrogen Dioxide Concentrations at Sample Locations in the Project Area. The concentrations are based on daily averages. The red line indicates the minimum contaminant threshold

Only two sample sites (see *Table 16*) had concentrations lower than the minimum threshold recommended by the WHO. This implies that an activity that causes additional emissions of NO₂ may have an impact on the health of local residents and ecosystems.

4. Sulfur dioxide (SO₂)

SO₂ is a colourless pungent-smelling gas that is created by the combustion of fossil fuels and the smelting of sulphur-bearing mineral ores. SO₂ is also produced domestically from heating fossil fuels in power generators and motor vehicles. According to the WHO, SO₂ affects the respiratory system functions of the lungs and causes irritation of the eyes. Exposure to the gas causes inflammation of the respiratory tract, leading to coughing,

mucus secretion, aggravation of asthma and chronic bronchitis. It makes people more prone to respiratory tract infections. Exposure to high concentrations of SO₂ may require the hospitalization of the victim. In some cases, a cardiac disease resulting from exposure to SO₂ may lead to death.

Another impact of SO₂ is acid rain, which results from an atmospheric reaction between the gas and rainwater. Acid rain destroys trees on some rooftops and (depending on the concentration) may pose a threat to untreated drinking water. The WHO recommended standard for SO₂ is 40 µg/m³ as a daily average. Figure 11 shows the daily average concentrations of SO₂ at the various sample locations. The background concentrations are already far above the daily recommended average; additional emission sources may pose a significant threat to people's health and ecosystems.

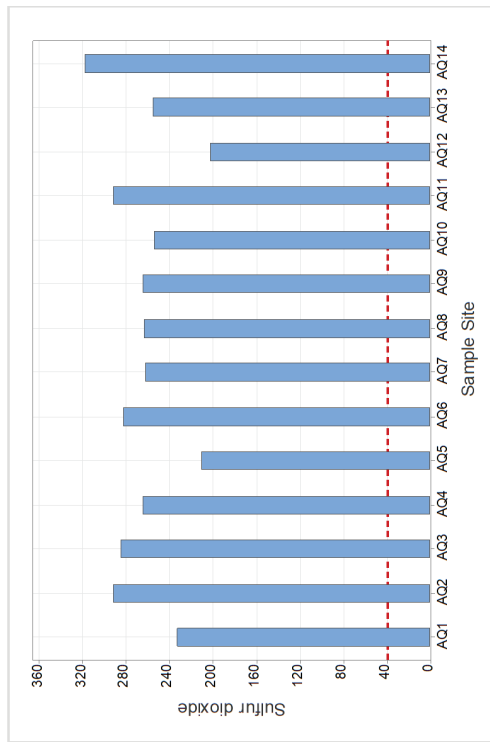


Figure 11: Sulfur Dioxide Concentrations at Sample Locations in the Project Area. The concentrations are based on daily averages. The red line indicates the minimum contaminant threshold

5.8 Wind Direction and Windspeed

The Wind Speed and Direction chart shows average wind speeds (in kilometres per hour) at the height of 10 metres. The average direction of the wind throughout an area is indicated by arrows. The wind's direction and speed are both important factors to consider in

observing and forecasting weather patterns. Wind speed and direction have a variety of effects on surface water. Evaporation rates, surface water mixing, and the development of earthquakes and storm surges are all influenced by these variables. Each of these processes has a significant impact on water quality and water level. The major concern is the impact of high winds on the high voltage distribution lines. Heavy storms characterize the Project area during the peak rainy season, which have enough energy to destroy buildings and trees. The proponent will install poles that resist heavy winds and power lines that are not in the way of the typical wind direction, where possible. The baseline data for wind speed and wind direction are shown in Figure 12.

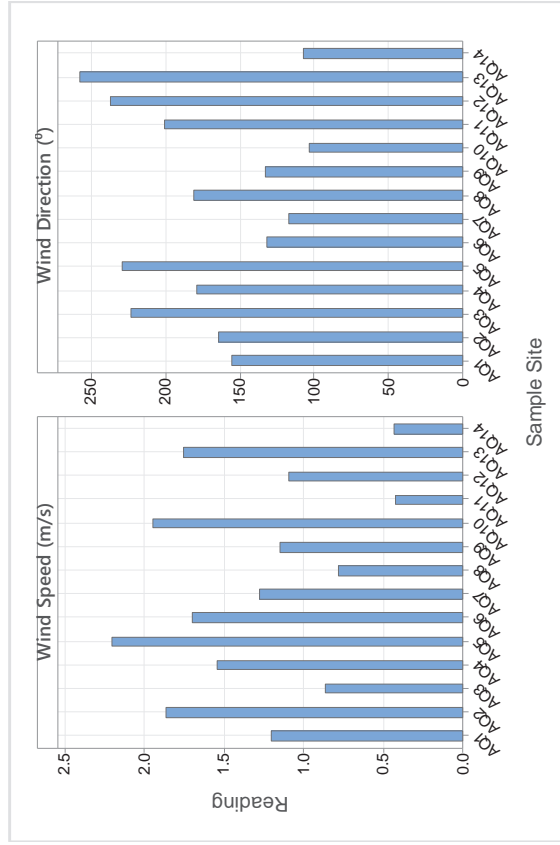


Figure 12: Wind Speed and Wind Direction Readings

5.9 Water Quality

The overall goal of a water quality assessment of community water supply sources is to evaluate their existing water quality state and ensure that the proposed Project development will not have an adverse effect on their water quality. Therefore, water samples were collected from water sources (surface water) that have the potential to receive run-off from the Project construction activities. These water bodies are only used

for laundering and other domestic uses.



Figure 13: In-situ Water Testing

Sampling Locations

Community surface water sources were assessed for water quality testing around the proposed site. Water samples were collected at 8 locations within the Project area. *Table 17* shows the Universal Transverse Mercator (UTM) coordinates of water sampling points

Table 17: Water Sample Points

No	Eastings	Northing	Location
WS1	710535.337	914619.977	Kerry Town
WS2	709800.102	909173.304	Tombo
WS3	702679.649	905644.747	Kent
WS4	703508.659	911802.367	John Obey
WS5	702362.807	916911.515	York
WS6	700126.34	918732.73	Tokeh
WS7	700473.403	922239.352	No 2
WS8	696113.275	922718.496	Bawbaw

Results and Discussions

Table 18 shows the water quality testing results.

Table 18: Water Quality Testing Results

Parameters	W1	W2	W3	W4	W5	W6	W7	W8	WHO recommended Permissible Limits
1. Water Temperature (°C)	30.4	30.5	33.9	27.9	29.0	29.4	28.4	30.6	No. Value
2. pH	6.63	6.50	5.81	5.20	4.95	6.10	6.38	6.99	6.5 – 8.5
3. Turbidity (NTU)	19	2	0	0	7	0	0	12	<5.0
4. Conductivity (µS/cm)	24	27	17	13	13	14	14	39	<500
5. Dissolved oxygen (mg/L)	2.69	5.15	8.87	6.73	5.44	6.58	6.82	6.68	<6
6. TDS (mg/l)	12	12.5	8.5	6.5	6.5	7	7	19.5	<248
7. Ammonia (mg/l)	0.52	0.21	0.07	0.03	0.12	0.20	0.24	0.04	No. Value
8. Copper (mg/l)	0.14	0.02	0.32	0.05	0.11	0.12	0.08	0.16	<1.0
9. Fluoride (mg/l)	0.92	0.025	0.13	0.03	0.09	0.025	0.04	0.34	<1.5
10. Iron (mg/l)	0.32	0.19	0.21	0.12	0.15	0.05	0.06	0.03	<0.3
11. Nitrite (mg/l)	0.01	0.03	0.01	0.01	0.01	0.005	0.05	0.02	3.0

12.	Nitrate (mg/l) HR	0.94	0.34	0.05	0.15	0.33	0.23	0.16	0.12	<10
13.	Potassium (mg/l)	16	4.3	0.9	2.2	0.13	2.3	1.2	1.2	<6.0
14.	orthophosphate (mg/l) LR	0.12	0.50	0.19	0.52	0.41	0.12	0.72	0.31	<0.035
15.	Sulphate (mg/l)	23.1	2.3	2.5	6.4	9.1	12.6	13.2	7.4	<400
16.	Chloride (mg/l)	11.1	4.2	3.0	3.2	1.9	4.8	10.8	10.4	<250
17.	Chromium	0.51	0.10	0.32	0.21	0.12	0.10	0.15	0.25	<0.05
18.	Zinc (mg/l)	0.01	0.15	0.91	0.13	0.17	0.05	0.41	0.51	<5.0
19.	BOD (mg/L O ₂)	4.2	3.2	1.2	1.3	1.8	1.4	1.3	3.5	Maximum Contaminant Level (MCL) or Guidelines for Drinking water. 5 (U.S. EPA)

1. pH

The potential of hydrogen ion concentration (pH) is a measurement of the concentration of hydrogen ions in a solution. This measurement determines whether the water is acidic or alkaline. On the pH scale of 0-14, a reading of 7 is "neutral". Acidic circumstances are indicated by readings below 7, whereas alkaline or basic conditions are indicated by readings over 7. The pH of naturally occurring freshwaters ranges from 6 to 8. The pH of water is significant because it influences the solubility and availability of nutrients, as well as how aquatic species use them. The WHO standard for pH is in the range 6.5-8.5.

2. Dissolved Oxygen

Dissolved oxygen (DO) is the oxygen available to support life in the water body; it is measured in milligrams per liter (mg/L). It is critical to the survival of various aquatic life such as fish and macroinvertebrates. The pH of water is significant because it influences nutrient solubility and availability, as well as how aquatic species utilize them. The more dissolved oxygen a body of water can hold, the colder it is. The concentration of DO in the water also influences the availability of heavy metals and nutrients. According to the WHO, a minimum dissolved oxygen concentration of 5-6 mg/L for warm waters and 6.5-9.5 mg/L for cold waters are ideal for aquatic life.

3. Biological Oxygen Demand

Biochemical Oxygen Demand (BOD) is a measure of the amount of oxygen needed by microorganisms to metabolize organic matter in the water body. The BOD is usually proportional to the amount of organic material detected in the water. High BOD depletes the amount of dissolved oxygen available to other aquatic life. A typical measurement method is DO measurements over a period of five days (BOD₅). According to the USEPA, BOD in freshwater should not exceed 5 mg/L.

4. Electrical Conductivity and Total Dissolved Solids

Electrical conductivity (EC) is an indirect measure of ion concentration that refers to the ability of water to conduct an electrical current. The presence of ions indicates the oxidation-reduction status, which influences biochemical activities in the water. This measurement is expressed in micro siemens per centimeter (µS/cm) at 25 degrees Celsius. According to the EPA, EC should not exceed 500 µS/cm in freshwater bodies. The parameter, Total dissolved solids (TDS), is a measure of the number of solids that are in solution. The WHO recommends that the TDS in freshwater should not exceed 248 mg/L.

5. Turbidity Parameter

Turbidity is a measurement of water clarity. It's the quantity of light scattered in water by suspended particles. Minerals or biological stuff can be used to make it. Nephelometric Turbidity Units are used to measure turbidity (NTU). The WHO recommends that turbidity should not exceed 5 NTU for drinking water.

6. Nitrogen species

Nitrogen in the water body exists in different species depending on the prevailing redox condition. It can exist as nitrates, nitrites, or ammonia. They are usually sourced from human and animal waste as well as from the atmosphere by nitrogen-fixing bacteria (e.g.,

cyanobacteria). According to the WHO, the maximum contaminant limit for nitrate is 50 mg/L and that for nitrite is 1.0 mg/L.

Unlike other forms of nitrogen, which can produce nutritional over-enrichment and indirect impacts on aquatic life at high quantities, ammonia has direct harmful effects on aquatic life. Ammonia can enter the aquatic environment in two ways: directly through effluent discharges and animal waste excretion, and indirectly through nitrogen fixation, air deposition, and runoff from agricultural fields. When ammonia levels in water are high enough, aquatic species have a hard time excreting the toxicant, which can lead to toxic accumulation in internal tissues and blood, as well as death. Ammonia toxicity in aquatic animals can be affected by environmental conditions such as pH and temperature. The US EPA recommends an acute criterion magnitude of 17 mg Total Ammonia Nitrogen (TAN) per litre for a one-hour average length at pH 7 and 20°C, not to be surpassed more than once per three years on average. The criteria for chronic exposure is 1.9 mg TAN/L at pH 7 and 20°C for a 30-day average duration, which should not be exceeded more than once every three years. *Figure 14* shows the baseline concentrations of water quality parameters in water bodies in the concession area. Most of the pH values are below the recommended threshold of 6.0 albeit the fact that waters in Sierra Leone are slightly acidic. Three of the sample sites showed Turbidity readings above the WHO recommended value of 5 NTU. The rest of the parameters show benign concentrations according to their respective recommended guideline values.

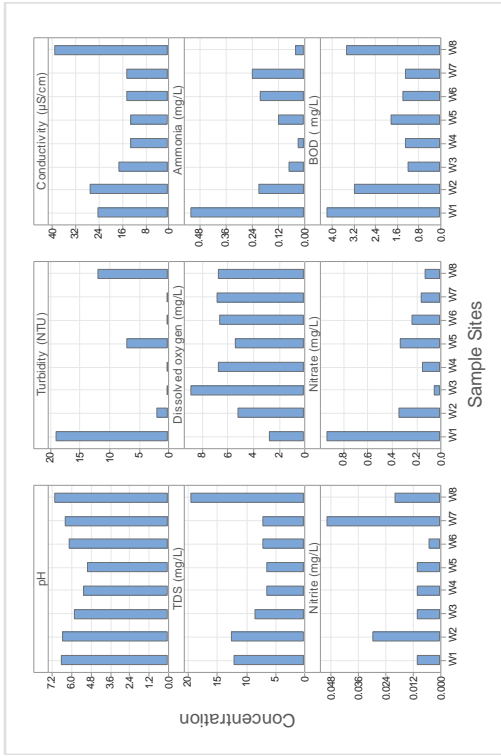


Figure 14: Water Quality Parameters in Selected Water Bodies within the Project Area

SECTION 6: SOCIO-ECONOMIC BASELINE OF THE PROJECT AREA

The socio-economic baseline is significant in determining the individual and household characteristics and living conditions of residents in the Project area.

6.1 General Socio-Economic Profile

6.1.1 Political Context

Since Sierra Leone's independence from the British colony in 1961, two main political parties have largely shaped the country's political history: the Sierra Leone People's Party (SLPP) and the All People's Congress (APC) (McIntyre, et al 2002). While the SLPP has a solid political base in the country's southern and eastern areas, where it gets the majority of its votes during elections, the APC has a solid political base in the country's northern and western regions. Like the other 15 political districts, the Western Area Rural District (WARD) has its own district council, headed by a chairperson the people directly elect. Although the WARD has traditionally been a swing district with roughly equal support for the two prominent political parties, majority of population has voted for the APC in presidential, legislative and local council elections since 2007. The re-introduction of local governance in 2004 was intended for individuals at the community level to participate in designing programmes that can develop their communities directly.

6.1.2 Population Growth

Sierra Leone has a total area of 72,300 km² and a population of 7,076,119 people, which includes 7,076,119 people in households and 15,994 people in institutions. (Statistics Sierra Leone, 2015). The rural areas account for 59% of the population, while the urban areas account for 41%. The report also reveals that the Northern Region is the most populous, with 2,508,201 people, followed by the Eastern Region (1,642,367 people), the Western Area (1,500,238 people) and the Southern Region (1,441,308 people).

With an intercensal population growth rate of 3.8 percent between 1985 and 2004, the WARD had a census population of 174,249 in 2004. By 2015, the district's population had risen to 444,270 people (221,351 men and 222,919 women), with an intercensal growth rate of 8.5 percent between 2004 and 2015 (Weeks and Bah, 2017). The increase in population has partly been attributed to post-conflict urbanisation, which is underpinned by perceived opportunities available in Freetown, Sierra Leone's capital and largest city. During Sierra

Leone civil conflict (1991-2002), WARD was a safe haven for Internally Displaced Persons (IDPs) from the provincial parts of the country, as it remained insulated from rebel invasion until 1997. The growth in population and the corresponding demand for housing infrastructure has tremendously contributed to the conurbation of the two districts constituting the Western Area (Western Area Urban District and WARD).

6.1.3 The Socio-Economic Characteristics

Waterloo is the district capital and largest city of the Western Area Rural District (WARD). The city, founded in 1891 as a settlement for liberated African, has provided administrative services and serves as an economic hub for the district. Before the decade-long civil war that engulfed the country between 1990 and 2002, agriculture was the main stay of people in the WARD. In addition to peri-urban agriculture, which included the cultivation of vegetables (lettuce, tomatoes, cucumber, spinach, spring onions and runner beans), poultry farming and fishing for supplying Freetown, the country's capital and largest city, the production of charcoal was a major economic activity for residents in the district (Thornton et al, 2012). These activities gained momentum when the war intensified in 1997, which saw the mass displacement of people in the rural areas that later sought refuge in the Western Area. The WARD was home to almost all of the Internally Displaced Persons (IDP) camps in the Western Area.

The IDPs leverage their agricultural skills by embarking on food production within the WARD. This was possible because, until 1997, the Western Area was the only insulated region from rebel activities. Many of the IDPs stayed in the city after the conflict finished in 2002, including ex-combatants who had difficulties returning to their home villages, which were often outside of WARD. Not only did this result in rapid population expansion, but it also led in a significant increase in population, which has changed the landscape of the WARD. Although urban agriculture continues to be an important economic activity, a significant number of residents have resulted in petty trading. Waterloo for instance currently serves as the centre for a greater majority of haulage trucks that transport vegetables from the provinces. In addition to these, tourism is another major economic activity. Apart from the established hotels and resorts in the WARD, another important and growing source of income is sand and stone mining, which is fuelled by the high demand for building materials.

6.1.4 Health Care

The Ministry of Health and Sanitation (MoHS), regulates and supervises healthcare delivery across the country, but it is provided by a variety of entities, including the MoHS, private individuals, and non-governmental organizations (NGOs). The MoHS provide health care services at four levels: the first level at the Maternal Child Health Post (MCHP), the second at the Community Health Post (CHP), the third at Community Health Centre (CHC) and the fourth at the hospital. In addition to the numerous private health care establishments including clinics and pharmacies, the District Health Management Team (DHMT) supervises 21 MCHP, 20 CHP, 12 CHC and 1 hospital (OCHA, 2015). That notwithstanding, traditional medicines continue to form part of the primary health care system in the WARD.

6.1.5 General Community Infrastructure

A list of community infrastructures identified during the study are presented below (*Table 19*)

Table 19: Some Community Infrastructure

Community Name	Approx. no. of Houses	Main Source of Drinking Water	Other Sources of Water	No. of Pre. & Pri. Sch	No. of Sec. Sch (JSS&SSS) & Tertiary Institutions	Type of Health Facility	No. of Churches & Mosques	Type(s) of Cultural site on Row	Other Community Infrastructure
Adonkia (including SLBC drive, Battalion, Metschem, Angola town, New Jersey, Emergency and Bango Farm)	500	Pipe Borne		7+	2+	CHC Hospital	15+		Market
Mile 13 Community	682	Pipe Borne	Stream	3	2	Hospital	7		Bar/Restaurant Hotel
Tombo Community	1705	Pipe borne/ Hand Pump	Well	2+	2+	CHC	4+		Market Radio station Community center Bar/Restaurant Hotel
Big Water	68	Stream		2	0		0		None
PWD Compound	341			2	0	CHC	4		None

Community Name	Approx. no. of Houses	Main Source of Drinking Water	Other Sources of Water	No. of Pre & Pri. Sch	No. of Sec. Sch (JSS&SSS) & Tertiary Institutions	Type of Health Facility	No. of Churches & Mosques	Type(s) of Cultural site on Row	Other Community Infrastructure
Mama Beach	682			4	1	CHC	6		Community centre Bar/Restaurant Hotel
Kosso Middle Town	91	Stream							None
Number 2 River Community	227	Pipe Borne		1	1		6		Bar/Restaurant Hotel
York Village	227	Pipe Borne		1	2	Hospital	4+		Community centre Bar/Restaurant Hotel
Kerry Town	100	Hand Pump							None
Mambo Community	795	Pipe Borne		5+	3+	CHC			Market Bar/Restaurant
Samuel Town	68	Hand Pump		6	4	Hospital	13		Community centre
During	91	Pipe Borne		2	0		5		Bar/Restaurant

Community Name	Approx. no. of Houses	Main Source of Drinking Water	Other Sources of Water	No. of Pre & Pri. Sch	No. of Sec. Sch (JSS&SSS) & Tertiary Institutions	Type of Health Facility	No. of Churches & Mosques	Type(s) of Cultural site on Row	Other Community Infrastructure
John Obey	307	Hand Pump	Stream	1	1	CHC	6		Community centre
Macdonald	227	Stream	Well	2	2	CHC Hospital	6+		Market Community centre Bar/Restaurant
Black Johnson	68	Stream	Well	0	0	0	3		Community centre Hotels Bar/Restaurant
Ogoo Farm Community	1022	Hand Pump	Wells	4	1	CHC	11+		Market Bar/Restaurant
Russel	68	Stream	Well	2	1	0	3		Hotels Bar/Restaurant
Boyor Village	68	Stream	Well	1	1	0	3		Bar/Restaurant
Madina	114	Stream	Well			None			None
Hamilton	1023	Pipe borne	stream	7	3	Hospital	9+		Market Community centre

Community Name	Approx. no. of Houses	Main Source of Drinking Water	Other Sources of Water	No. of Pre & Pri. Sch	No. of Sec. Sch (JSS&SSS) & Tertiary Institutions	Type of Health Facility	No. of Churches & Mosques	Type(s) of Cultural site on Row	Other Community Infrastructure
									Bar/Restaurant
Kissy Town	80	Stream	Well	2	2	CHC	3		Bar/Restaurant Hotel
BawBaw Community	170	Stream	Well	1	1	None	5		Community centre Bar/Restaurant Hotel
George Town	80	Stream	Well			None			None
Tokeh Community	386	Stream	Well	2	1	CHC Hospital	9		Community centre Bar/Restaurant Hotel
Lakka Community	795	Pipe Borne		7	3	CHC Hospital	15+		Community centre Bar/Restaurant Hotel

Annex 61 (ESHA)

Community Name	Approx. no. of Houses	Main Source of Drinking Water	Other Sources of Water	No. of Pre & Pri. Sch	No. of Sec. Sch (JSS&SSS) & Tertiary Institutions	Type of Health Facility	No. of Churches & Mosques	Type(s) of Cultural site on Row	Other Community Infrastructure
Sussex	341	Stream	Well	2	2	CHC	4+		Community centre Hotel Bar/Restaurant
Kent	150	Stream				None			None

6.1.6 Waste Management and Disposal

Like other parts of third-world countries, Sierra Leone is challenged with waste generation and disposal. Poor waste management practices in Sierra Leone owing to the everyday habits of dumping waste in water bodies and unrestrained dump sites worsen the problems of generally low sanitation levels across the country. As the adverse health consequence has become a rising concern mainly due to the increase in urbanization, changes in consumer patterns and industrialization, which all directly translates to an increase in waste generation, the sustainable management of waste is crucial to the well-being of residents, the environment, and revenue and power generation. Successive governments in the country have been applying different approaches in a bid to get rid of the problem. This challenge is real in the Project area. Similarly, there is no known landfill/communal dumpsite in the Project area. The closest landfill/communal dumpsite from the Project area of influence is located in Waterloo (i.e. along the Waterloo – Masiaka highway at 712657.57E; 921238.97N).

6.2 Socio-Economic Baseline Assessment

6.2.1 Methodology

The survey was adopted through multiple data collection approaches, including primary and secondary data. Secondary data was collected from the Freetown City Council, Western Area Rural District Council (WARD C), Statistics Sierra Leone, World Bank, WHO and other sources. Most importantly, primary data was collected from PAPs using a structured questionnaire. A questionnaire was designed, and with the input and approval of the client, it was later coded into Kobo Collect Toolbox. Kobo Collect Toolbox is an open-source tool for mobile data collection. It allows researchers to collect data in the field using android enabled mobile phones and tablets.

6.2.2 Ethical Considerations

Before participating in the survey, all participants gave their informed consent. The informed consent highlighted the purpose of the study and detailed observance of confidentiality of data collected.

6.2.3 Data Collection

The structured questionnaires used throughout the data collection process were programmed into an electronic platform to fast-track and enhance the data collection

process. The electronic platform was enhanced to geo-reference the location of every respondent interviewed to facilitate Real-Time Data (RTD) monitoring of data collected remotely from all enumerators, thus, enhancing the quality of data collected. The questionnaire was programmed into the Kobo Collect Toolbox which was used to collect data from respondents.



Figure 15: Enumerators Conducting Interviews

Study Design

A total of 35 settlements, Adonkia (including SLBC drive, Battalion, Metschem Angola town, New Jersey, Emergency and Bango Farm), Mile 13, Tombo, Big Water, PWD Compound, Mama Beach, Kossoh Middle Town, Number 2 River, York, Kerry Town, Mambo, Samuel During, John Obey, Macdonald, Black Johnson, Ogoo Farm, Russel, Boyoi, Madina, Hamilton, Kissy Town, Baw Baw, George, Tokeh, Lakka, Sussex, and Kent were covered in the study, which includes all the settlements located within the Project area. To achieve the study's goals, the researchers used a hybrid methodology that incorporated quantitative and qualitative data collection approaches. The study also used desk review, which included secondary data collecting and analysis, qualitative and quantitative (primary) data collection, and data triangulation from many sources.

6.2.5 Sample Size

Five hundred and eighty-nine (589) household questionnaires were administered randomly to sampled household heads by trained enumerators in Krio Language. *Table 20* shows the minimum sample size calculated and the actual number of questionnaires administered. The minimum sample size was derived by dividing the approximate population along the proposed Project route of each target community by the national average of the number of residents per house (8.8). The household population was achieved by multiplying the number of houses by 1.9 (1.9 Households per house in the Western Area) and multiplying by 0.05 (5%). (Statistics Sierra Leone, 2015)

6.2.6 Quality Control and Reliability

The tools were created by the Mohapewa socioeconomic team, approved by the Manager, and then piloted in the Project area for final approval. Two (2) supervisors oversaw the full data collection process with ten (10) clever and experienced enumerators in the field, while one senior consultant was engaged in Real-Time Data (RTD) monitoring remotely from a dashboard during data collection (home survey - questionnaire). To maintain uncompromised data quality and to corroborate the enumerator's household visit, all households interviewed were geo-referenced.

2 days of training sessions on the tools were also conducted for all enumerators to clearly understand the tool, which immensely improved data validity. Understanding the data collection tools and ethical considerations related to data collection are included in the training program.

6.2.7 Data Analysis

All the quantitative data at the central server was merged in a single excel file. The data was then transferred to Stata14. Stata enables further data cleaning and logical checks to check for inconsistencies on the data set before analysis. Stata was used to analyse quantitative data and result represented in tables, charts, and graphs, and a summary explanation is provided

Table 20: Household Survey Sample Size Determination

Community Name	Approx. No. of Houses (A)	App. Population (B)=A*8.8	Approx. No. of houses along Transmission Line (C)	App. Population (D)=C*8.8	App. Households(HH) D=(C*1.9)	Min. Sample Size (5% HH)	Actual Sample size
Adomkia (including SLBC drive, Battalion, Metschem Angola town, New Jersey, Emergency and Bango Farm)	500	4400	150	1320	285	14.25	61
Mile 13 Community	682	6000	65	572	123.5	6.175	32
Tombo Community	1705	15000	130	1144	247	12.35	48
Big Water	68	600	50	440	95	4.75	33
PWD Compound	341	3000	45	396	85.5	4.275	31
Mammah Beach	682	6000	40	352	76	3.8	26
Kosso Middle Town	91	800	10	88	19	0.95	26
Number 2 River Community	227	2000	80	704	152	7.6	24
York Village	227	2000	20	176	38	1.9	22
Kerry Town	100	880	30	264	57	2.85	22
Mambo Community	795	7000	75	660	142.5	7.125	30
Samuel Town	68	600	30	264	57	2.85	18

6.2.8 Household Surveys

Questionnaires were administered to 589 participants representing households within the communities surveyed. As shown in *Figure 16*, 562 respondents took the interview, and 27 respondents did not (making up 5%).

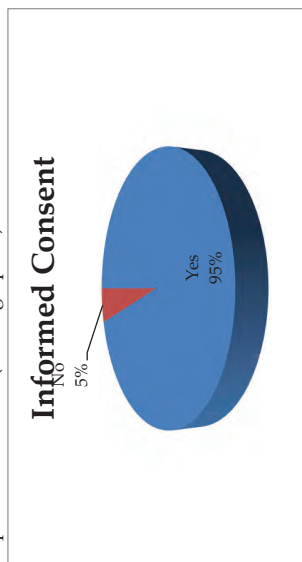


Figure 16: Informed Consent
Source: Socio-Economic Household Survey February 2022.

1. Nature of Respondents

Questionnaires were administered to household heads or any close representative such as a spouse. About half (49%) of the questionnaires were administered to household heads, 24% to spouses of household heads, and the remainder were to their parents, siblings or children.

Community Name	Approx. No. of Houses (A)	App. Population (B)=A *8.8	Approx. No. of houses along Transmission Line (C)	App. Population (D)=C*8.8	App. Households(HH) D=(C*1.9)	Min. Sample Size (5% HH)	Actual Sample size
During	91	800	10	88	19	0.95	17
John Obey	307	2700	30	264	57	2.85	19
Maddonald	227	2000	25	220	47.5	2.375	16
Black Johnson	68	600	20	176	38	1.9	15
Ogogo Farm Community	1022	9000	70	616	133	6.65	18
Russel	68	600	6	52.8	11.4	0.57	10
Boyor Village	68	600	6	52.8	11.4	0.57	10
Madina	114	1000	6	52.8	11.4	0.57	10
Hamilton	1023	9000	7	61.6	13.3	0.665	14
Kissy Town	80	700	2	17.6	3.8	0.19	4
Baw Baw Community	170	1500	5	44	9.5	0.475	10
George Town	80	700	2	17.6	3.8	0.19	1
Token Community	386	3400	40	352	76	3.8	18
Lakka Community	795	7000	10	88	19	0.95	14
Sussex	341	3000	12	105.6	22.8	1.14	20
Kent	150	1320	10	88	19	0.95	20
Total	10476	92200	986	8676.8	1873.4	93.67	589

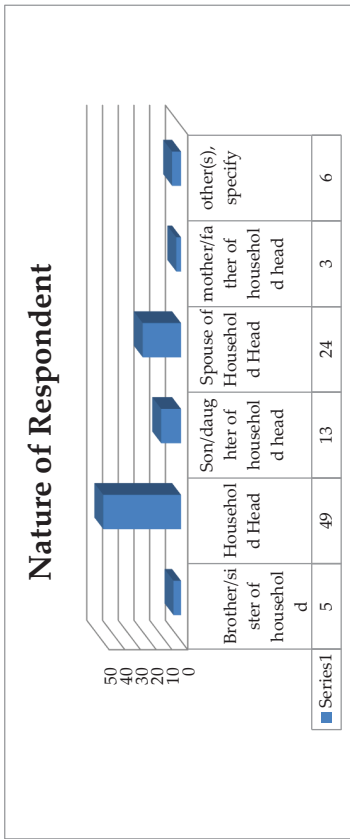


Figure 17: Nature of respondents
Source: Socio-Economic Household Survey February 2022.

2. Gender of Household head

As indicated in **Figure 18**, 78% of households are male-headed, with a significant proportion (22%) of households headed by females. The 22% of female-headed households could mean a little high vulnerability to economic shocks for this population within the city's rural population.

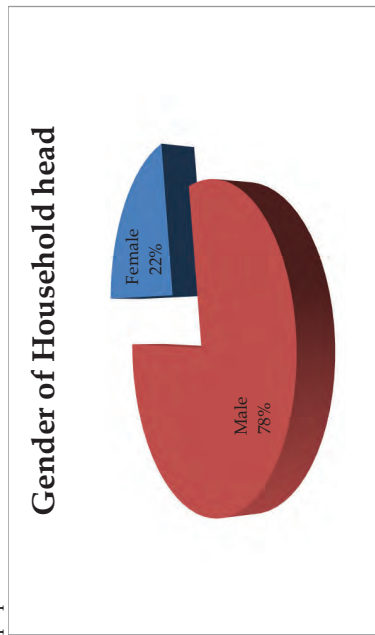


Figure 18: Gender/Sex of Household Head
Source: Socio-Economic Household Survey February 2022.

3. Age of Household head

The result in **Table 21** shows that quite a significant proportion (90.3%) of household heads interviewed fall within the active working-age cohort (19 - 59yrs). The increased proportion of households with members above the age of 19 suggests that respondents' responses will be of higher quality. This may also suggest that the surveyed communities have got potentially available labour. However, the more significant proportion of household heads within the active working-age bracket does not represent the required available skills or technical inclination of the proportion surveyed regarding the proposed distribution line Project.

Table 21: Age of Household Head

Age of Household head	Frequency	%
19 to 29 years	58	10.32
30 to 39 years	163	29.00
40 to 49 years	178	31.67
50 to 59 years	109	19.40
60 to 69 years	46	8.19
70 & above	8	1.42
Total	562	100.0

Source: Socio-Economic Household Survey February 2022.

4. Marital Status of Household head

Data below collected from the field survey shows that 65.3% of household heads are married. This may imply that the communities surveyed could be less violent. Studies have shown that communities with fewer married persons are likely to have high crime rates and other violent issues.

Table 22: Household Head Marital Status

Marital Status	Frequency	%
Married	367	65.30
Single	94	16.73
Co-habiting	46	8.19
Widowed	32	5.69
Divorced/Separated	23	4.09

Total	562	100.0
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Source: Socio-Economic Household Survey February 2022.

5. Households in a House

The survey result indicates that about 66.7% of houses in the study population are occupied by one household, two households occupy 13.0%. Three or more households occupy 12.1%. According to the 2015 Census, Western Area has an average of 1.9 households per house as opposed to 1.6 national averages. The large number as houses with one household is a result of the fact that most of the communities in the study area are emerging communities.

Table 23: Number of Households in a House

Number of Households	Frequency	%
One household	375	66.7
Two households	73	13.0
More than three households	68	12.1
Three households	40	7.1
No Response	6	1.1
	562	100

Source: Socio-Economic Household Survey February 2022.

6. Education and Labour Profile

The educational requirement has been one of the major determinants of persons or household engagement in profitable livelihood activities. Several authors, for example, Tran et al. registered education has a positive effect on choosing better livelihoods, household income and poverty reduction. Figure 19 show that 31.7% of households surveyed have no former English education, and only 14.8% have at least attained tertiary education or have been admitted to the tertiary education system.

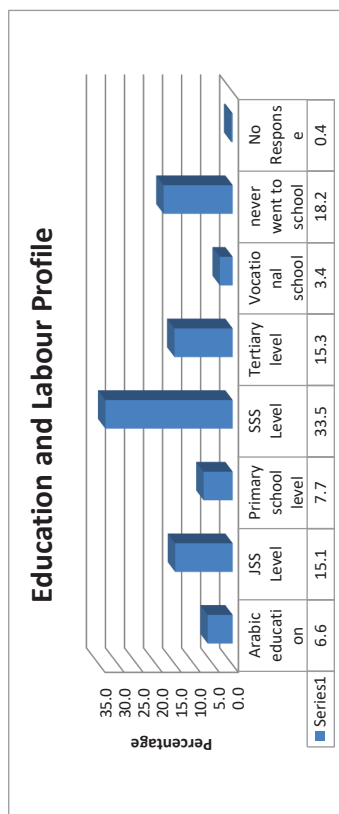


Figure 19: Educational Status of Household Head

Source: Socio-Economic Household Survey February 2022.

The low proportion of people with higher education in the communities surveyed could imply a scarcity of skilled technical labour and a high likelihood of a variety of active informal revenue and livelihood activities in the communities.

Households with children of primary school-going age (6 to 13 years) were asked whether their children were enrolled in primary school. 97.4% reported that all their children were enrolled in primary school, while 2.6% or 8 respondents claimed that not all their children are in primary school. The national dropout rate at the primary school level is 0.6%. The GoSL has in August 2018 launched the Free Quality School Education (FQSE) initiative that provides free admission and tuition to all children in government-approved schools. Parents in the Project area should be encouraged to send all their children to school.

Table 24: Primary School Enrolment

Primary School Enrolment	Frequency	%
Yes	298	97.4
No	8	2.6
N-Value = 306		

Source: Socio-Economic Household Survey February 2022.

Those who reported that their children were not in school were asked to give reason(s). The reasons were that either the cost of school materials (such as uniforms, shoes, bags, and books) is not affordable or there is no primary school in the community.

7. Secondary School Dropout Rate in Project Area
Households (494 HH) with children of secondary school-going age (13 to 19 years) were asked whether all their children were enrolled in Secondary school. Data show that a significant proportion (12.8%) of households has at least one child who has dropped out of school. The start of the Free High-Quality School Education program (FQSE) in August 2018 was supposed to usher in unique opportunities for pupils in government and government-assisted schools and reduce the out-of-school children and dropouts in the system. However, the result of the survey showed that most students still drop out of secondary school in the Project area

Table 25: Whether HH has children of Secondary School-going age but not in school

HH with Children Drop-out of Secondary School	Frequency	%
Yes	63	12.8
No	431	87.3
N Value =494		

Source: Socio-Economic Household Survey February 2022.

8. Reason for Secondary School Dropout Rate
Those who reported that their children were not in Secondary school (63 households or 12.8%) were asked to give reason(s). The responses revealed that about 47.6% are not in school because parents could not afford other costs associated with secondary school education (books, uniform, bag, shoe and daily lunch), 15.9% assist households in trading and other income-generating activity and 9.5% are engaged in commercial bike riding. 6.3% blamed it on the absence of Secondary schools in the community.

Table 26: Reason for child/children drop-out of Secondary school

Reason for child/children not in secondary school	Frequency	%
Cost of secondary schooling is not affordable	30	47.6
To assist the household in trading or other income-generating activities	10	15.9
Commercial bike riding	6	9.5

No secondary school in the community	4	6.3
Not interested in education	5	7.9
Unwanted and/or early pregnancy	8	12.7
Total	63	100
N= 63		

Source: Socio-Economic Household Survey February 2022.

9. The Religion of Household Head

The Muslim religion predominates the study area, accounting for 64%, with Christianity accounting for 35% of households surveyed. Each religion has its unique cultural practices, and effort should be made to protect these religions and their various practices.

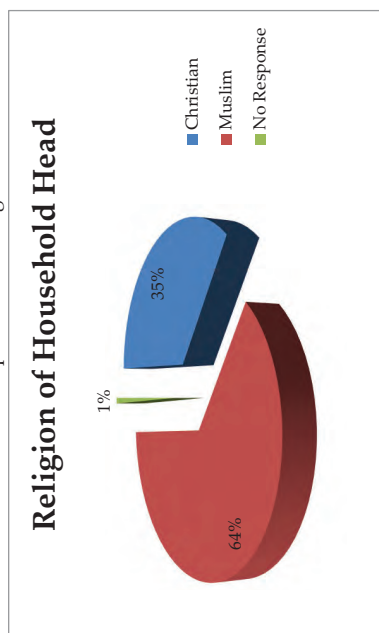


Figure 20: Household Head Religion

Source: Socio-Economic Household Survey February 2022.

10. Culture, Ethnicity and Language

Eminent ethnic groups in the Project area include Temne, Mende, Limba, and Krio. The Temnes are the dominant ethnic group in the Project area, and this ethnic group makes up over one-third of the population – 38.6%. The official language of Sierra Leone is English, although Krio is spoken by 90% of the country's population and by 10.5% as a mother tongue. However, within the Project area, the most frequently spoken language is Krio. This is so because of some form of acculturation and to larger assimilation taking about migrant residents who have resided in the communities for a long period, even though they still recognized their inherited tribe. Over 98% of residents in the surveyed are indigenes of Sierra Leone, with less than 2% foreign nationals

Table 27: Household and Ethnicity

Ethnicity of Household Head	Frequency	%
Temne	217	38.6
Mende	92	16.4
Limba	65	11.6
Krio	47	8.4
Fula	36	6.4
Sherbro	25	4.5
Madingo	20	3.6
Loko	16	2.9
Kono	14	2.5
Susu	9	1.6
Koranko	8	1.4
Kroo	1	0.2
Foreign Nationals (Nigerian, Guinea & Lebanese)	9	1.6
No response	3	0.5
	562	100

Source: Socio-Economic Household Survey February 2022.

11. Vulnerable Groups

Children, women, elderly people, those who are sick, disabled and those who are part of any ostracized or disempowered minority are considered most vulnerable among other vulnerable groups. The operationalisation of the proposed distribution line Project could affect vulnerable people differently from others. At the same time, employment opportunities will be made equal between racial and religious groups, but sick and heavily disabled persons may be unable to work. Road crossing and access to other services/facilities for children and disabled could be affected by the Project when there is an influx of people due to the availability of electricity. In particular, very few potentially vulnerable groups were identified in the Project vicinity.

12. Household Head Community Tenancy and Migration Status

According to the field survey, a large proportion (73%) of households surveyed indicates that they were not born in the communities but had moved in from mostly the north and other parts of the western area.

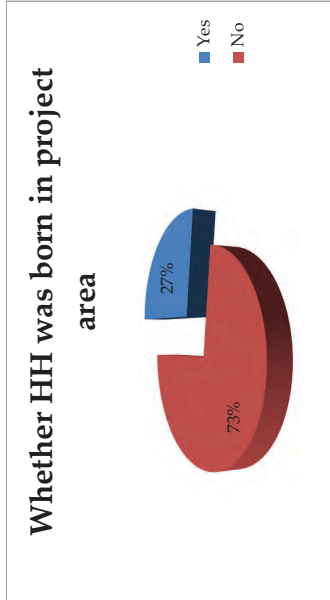


Figure 21: Household was born in Project Area.

Source: Socio-Economic Household Survey February 2022.

The most eminent and evident reasons for households moving to the communities is for accommodation purposes (56.1%) followed by employment (20.1%) and trading (11.1%). Of these, 61.3% have stayed between 1 to 10 years, 22.6% have stayed between 11 to 20 years, and 11.3% have stayed between 21 to 30 years as shown in Table 28 below.

A large percentage (61.3%) of residents to have stayed for 1 to 10 years which is in line with the reality that most of the Project area settlements are emerging.

Table 28: Non-indigenous Household Residence Period in Community

Years Stayed	Frequency	%
1 to 10 years	250	61.3
11 to 20 years	92	22.6
21 to 30 years	46	11.3
31 to 40 years	15	3.7
41 to 50 years	5	1.2
	408	100
N =	408	

Source: Socio-Economic Household Survey February 2022.

13. Housing/Dwelling Type

14. Livelihood and Economic Profile

The dominant primary income-generating activity within the Project area is trading (41.3%) followed by those who claimed to be self-employed (19.2%). Fishing activities account for 10.9%, and those that are not engaged in any form of income-generating activity (for the purpose of this survey, refers to as the unemployed) account for 6.4%. The high proportion of households' dependency on trading and other forms of informal income-generating activities could be attributed to the low proportion of households that have attained tertiary or post-secondary education (*see Source: Socio-Economic Household Survey February 2022.*).

A more significant proportion (42.4%) of the households surveyed live in standard concrete houses (one flat and storey buildings) 6.1% live in houses built of mud and not plastered with cement. 23.7% live in mud houses plastered with cement. However, about 95% of these dwelling units have either concrete floors or tiles.

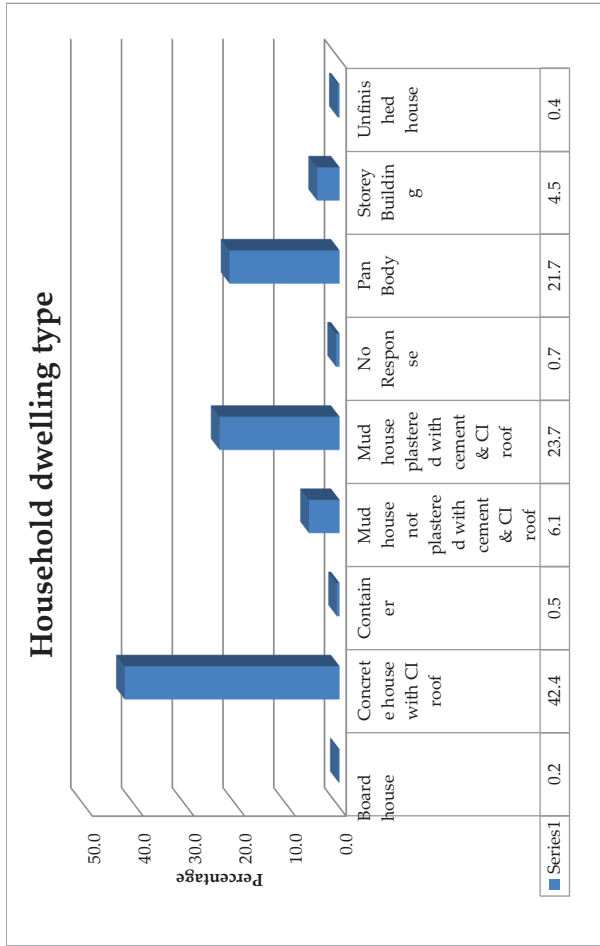


Figure 22: Household Dwelling Type
Source: Socio-Economic Household Survey February 2022.

Table 29: Occupation of Household Head

Main Occupation	Frequency	%
Administrator	8	1.4
Civil servant	17	3.0
Commercial Bike Rider	14	2.5
Dairy Labour	23	4.1
Farming	18	3.2
Fishing	61	10.9
Health worker	2	0.4
Imam	1	0.2
Local Government	3	0.5
NGO Worker	4	0.7
Quarry	11	2.0
Retired	2	0.4
Sand Mining	2	0.4
Self-employed	108	19.2
Teaching	17	3.0
Trading	232	41.3
Unemployed	36	6.4
No Response	3	0.5
	562	100

Source: Socio-Economic Household Survey February 2022.

A greater proportion (22.2%) of the household heads surveyed on average earn between Le 401,000 to Le 800,000 monthly. 16.4% earn on average between Le801,000 - Le1 million and Le1,100,000 - Le2 million on monthly basis. Only one respondent claimed to earn above 8 million Leones monthly. The low-income level of a household could be likely associated with the type of income-generating activities undertaken by households. The operationalisation of the proposed Project could have significant

positive impacts of the income level of the household. Electricity greatly improves the quality of life as trading activities will boom, which will improve household income. Income levels are determined by the country's Gross Domestic Product per capita (a measure of the country's economic output per person) in Sierra Leone; the GDP per capita was last recorded at 624.71 US dollars in 2020, which was one of the lowest in the world.

Traditionally, poverty in Sierra Leone has been measured using the income/expenditure approach, which is the main tool to analyse the levels and distribution of poverty in the country. However, given the importance of other dimensions in understanding poverty, non-monetary measures have become an important tool for poverty analysis. On average, the poor people of Sierra Leone can only meet 69.8 percent of their basic needs and 89.2 percent of their food needs. Those in Western Area, especially Freetown, can meet 77.5 percent of their basic needs, while those in the rural areas can meet 67.3 percent of their basic needs (South 72 percent; North 68.2 percent; East 65.7 percent). (Sierra Leone's Medium Term Development Plan 2019 - 2023)

The Multidimensional Poverty Index of Sierra Leone has five dimensions (health, education, living standards, housing, and energy). According to Sierra Leone's Medium Term Development Plan 2019 - 2023, multidimensional poverty (the percentage of people classified as multidimensionally impoverished) was 64.8 percent. This means that almost two-thirds of the population in Sierra Leone is identified as multidimensionally poor.

Table 30: Average Income Distribution among Household Heads

Average Monthly Income from the main occupation	Frequency	%
Le2,100,000 – Le3,000,000	71	12.6
Le3,100,000 – Le4,000,000	33	5.9
Le4,100,000 – Le8,000,000	11	2.0
Le1,100,000 - Le2m	92	16.4
Le201,000 - Le400,000	56	10.0
Le401,000 – Le800,000	125	22.2
Le801,000 - Le1m	92	16.4
Up to Le200,000	49	8.7
Above Le8m	1	0.2

No Response	32	5.7
	562	100

Source: Socio-Economic Household Survey February 2022.

The general low-income level of households suggests that the vast majority of them are poor and thus extremely exposed to economic shocks.

15. Health and Safety

Researchers have discovered a link between environmental conditions and the health of people who live in the same neighbourhood. As a result, bad health conditions in individuals or communities are strongly linked to poor environmental management. Typical examples include: trapped or stagnated water serves as a breeding ground for mosquitoes, and there is a well-established axiom that mosquito is malaria/plasmodium, transfer agent.

Electricity is a major enabler for enhancing health systems and meeting the Sustainable Development Goals in the health sector. (SDGs).

As indicated in Figure 23 below, Malaria is reported as the most prevalent (about 48.8%) disease in the surveyed area, followed by Cold/cough/flu (26.3%), Eye irritation (8.2%), and typhoid (4.8%) reported diseases in the study communities.

attention, as the proposed Project is likely to mount pressure on land and other current facilities as a result of a large influx of people from all around the city.

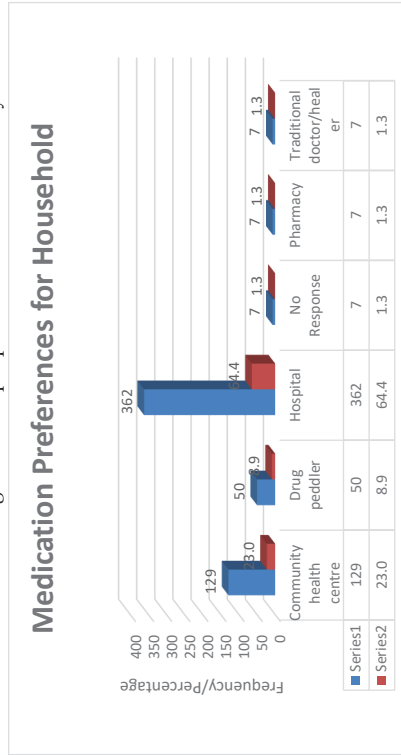


Figure 24: Treatment Preference for Household
Source: Socio-Economic Household Survey February 2022.

17. Potable Water

Water is crucial to economic growth and development. Providing safe water for human consumption is of great importance for health and wellbeing. The water supply should be free of chemical and biological contaminants. They should be regularly and conveniently available. Many people in the City of Freetown are suffering from water shortages.

As indicated in Figure 25, about 42.7% of the households in the study area rely primarily on pipe-borne water for domestic and drinking purposes, and 25.4% mainly rely on open wells. About 31% rely on other water sources that include water from hand pump wells and streams/rivers.

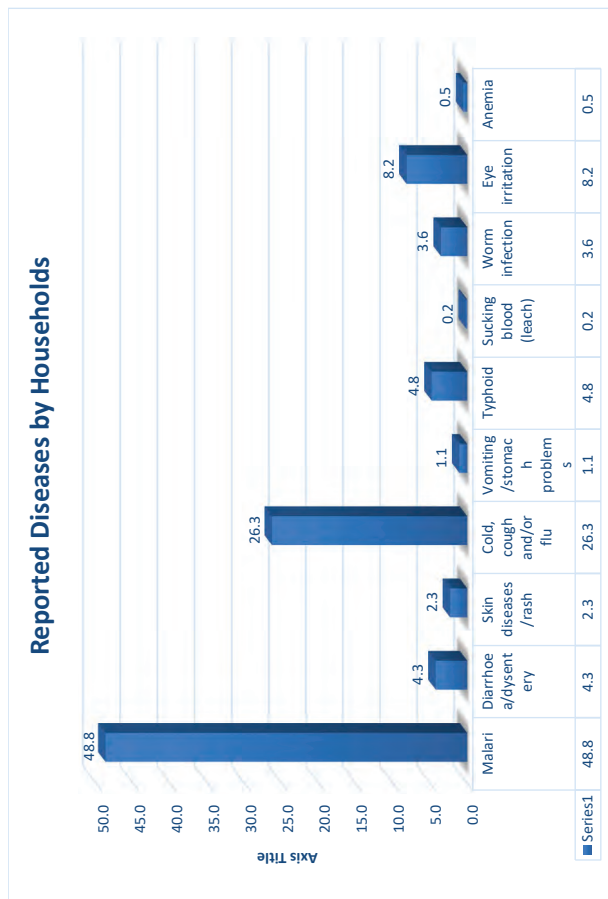


Figure 23: Community/Household Disease Prevalence
Source: Socio-Economic Household Survey February 2022.

Respondents are fully aware of the links between mosquitoes, the environment, and malaria, according to the findings. The majority of respondents said that cleaning the environment around the house, clearing vegetation around the house, and draining stagnant water can minimize mosquito populations, and 63 percent said they used at least one of these strategies to avoid malaria. Many respondents agree that these malaria-controlling environmental management strategies are successful.

16. Availability of Health Facility and Access

Only a minimal number of the households interviewed (8.87%) reported having a health facility in their communities. This, therefore, reveals that access to hospitals or community health centres in the study area is not a challenge.

As indicated in Figure 24, more than half (64.4%) of the households interviewed reported seeking medication from hospitals whenever they fell sick. Second to the hospital is the Community Health Center (CHC), which accounts for 23% of households. However, required facilities and staff capacity need to be given adequate

The average distance to a drinkable water source for families in the surveyed region is 90.5 m, according to survey data. It means that, regardless of supply frequency, most households in the surveyed area have improved access to drinkable water sources. Those who claim that the water quality is poor allege that it has a bad flavour or colour, particularly during the dry season.

18. Waste Management

Solid and liquid wastes are the two types of trash that are commonly encountered. Domestic, industrial, office or agricultural wastewater might be the first, while wastewater or sewage could be the second (e.g. faeces). If solid wastes are not managed properly, they can pose many environmental and human health risks. For instance, blocking storm drains can cause malaria and other diseases. Fires set at disposal sites can cause major air pollution, causing illness and reducing visibility, making disposal sites dangerously unstable and possibly spreading contaminants to adjacent property.

The survey data indicates that over one-third of households in the study communities dispose of their solid waste by burning (39.1%) and about one-fourth throw in the bush. Only one-fifth (22.4) dispose of their waste through commercial waste collectors. The data shows that households surveyed do not practice environmentally friendly and sustainable waste management. These poor household waste management practices could be linked to prevailing community diseases (See

Figure 23: Community/Household Disease Prevalence

Source: Socio-Economic Household Survey February 2022.

-Figure 23).

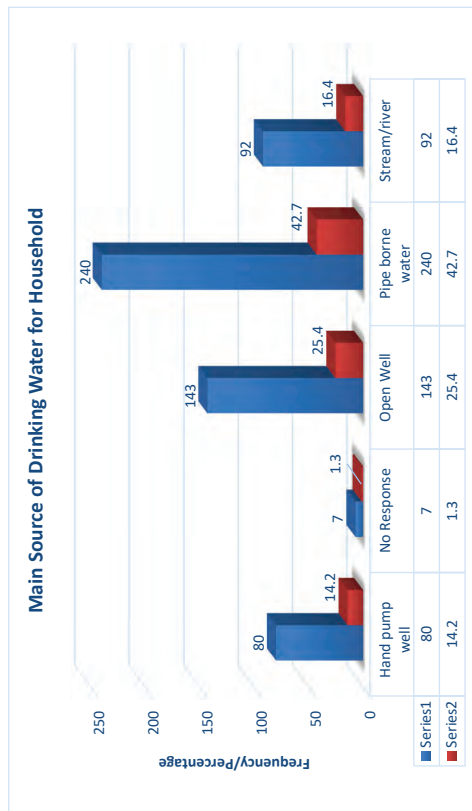


Figure 25: Main Source of Drinking Water

Source: Socio-Economic Household Survey February 2022.

An overwhelming majority (89%) of households' heads reported good water quality. Results from the analysis show that the majority (67%) of the households have their water source within their compound or neighbouring compound.

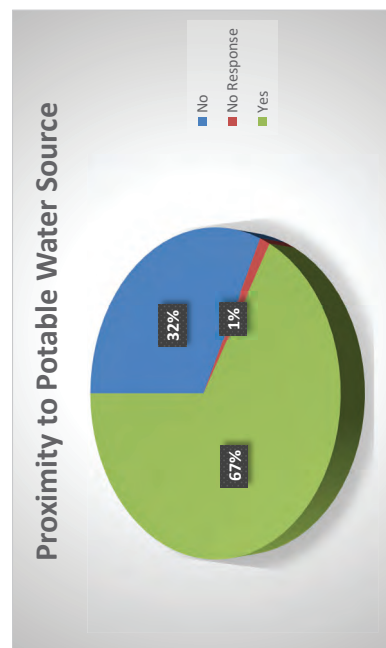


Figure 26: Proximity to Potable Water Source

Source: Socio-Economic Household Survey February 2022.

20. Household Energy Use for Cooking

The type of energy source that households/persons rely on could affect the health and wellbeing of the person/household. For instance, using an electric base cooker is healthier than using a gas base cooker. A gas base cooker is more beneficial than using coal and wood. Data captured from the field survey shows that over half (56%) of households in the study area use charcoal, and over one-third (37%) use wood which is not an improved energy source for cooking food. The proposed Project will likely impact these energy sources as residents will have access to safer energy sources for household use – cooking and warming homes.

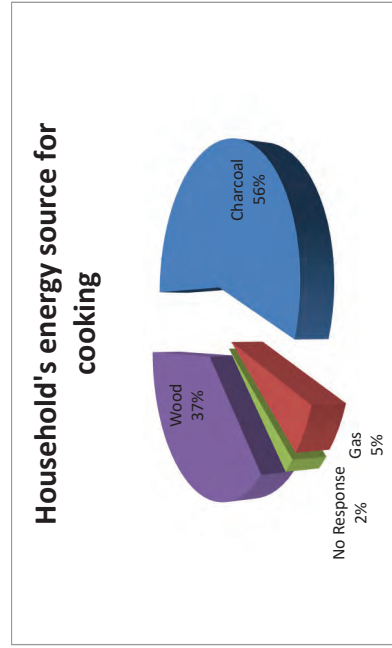


Figure 28: Household Sources of Energy for Cooking
Source: Socio-Economic Household Survey February 2022.

21. Energy Source for Lighting
Figure 29 below indicates that over one-third (39.5%) of households surveyed use a flashlight to light homes at night. Only about one-fourth (27.6%) use the Government EDSA light. Communities such as Adonkia, Emergency New Jersey, Bango Farm, Ogoo farm Lakka, Hamilton are connected to the national grid. The proposed Project will improve these energy sources as every household along the Project route that is able and willing to be connected will be connected to electricity.

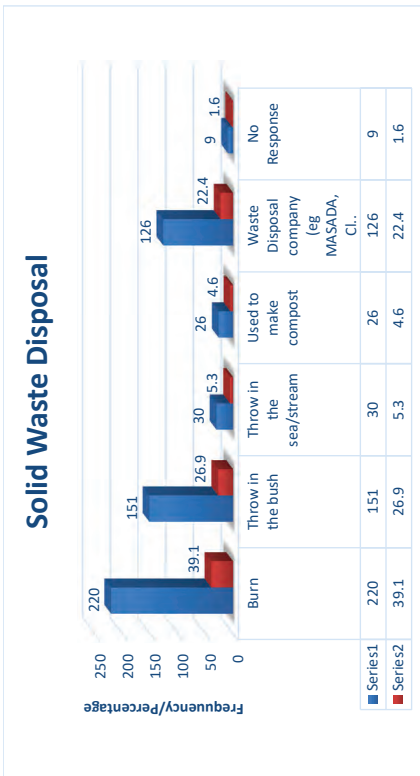


Figure 27: Waste Disposal Method by Households
Source: Socio-Economic Household Survey February 2022.

19. Sanitation: Type of Toilet Facility used by Household
The traditional pit latrine is the most common toilet facility within the Project area. It is reportedly used by 34.9% of households, followed by the flush (30.8%) and the ventilated improved pit latrine (19.6%) available within their premises. The proposed Project would have insignificant/zero impacts on these facilities.

Table 31: Type of Toilet Facility used by Household

Sanitary Facility Use by Household	Frequency	%
Bucket	9	1.6
Bush	46	8.2
Flush	173	30.8
Stream/river	21	3.7
Traditional pit latrine	196	34.9
Ventilated pit latrine	110	19.6
No Response	7	1.3
Total	562	100.0

Source: Socio-Economic Household Survey February 2022.

the well-being of its members throughout their lives. Respondents believed that none of these cultural practices would be negatively impacted by the Project. The only known historical site in the Project area is a relic of an old bus stop at York village. This site will host a secondary substation. However, construction shall not impact this asset.



Figure 30: Relics of Old Bus Stop site- York Village

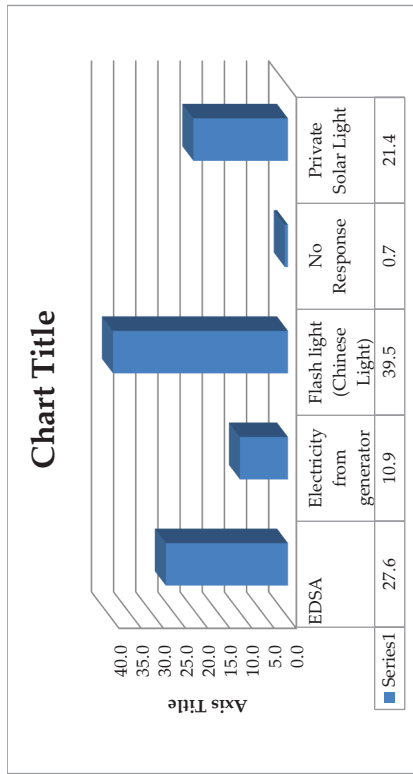


Figure 29: Household Source of Energy for Lighting Homes

Source: Socio-Economic Household Survey February 2022.

22. Cultural and Historical Study

Ojeh, Hunting, and Female secret society are the only cultural practices in the Project area. There are also burial grounds in most communities along the Project route. The Ojeh is a predominately male society. The role of females is restricted to contributing to the music and preparing food on special occasions, but they are not entitled to enter the shrine of Ogun for fear they might cause contamination of the 'deity'. The purpose of the Ojeh society is divergent and not always obvious. Initially, The Ojeh developed a reputation for their capacity to heal the sick and afflicted, but especially for the malevolent powers of the resident "mercin man".

Nowadays, the Ojeh societies operate as elite social clubs, while underemployed urban youths also developed versions of these societies for their own entertainment and political expression.

The hunting society is a masquerade that is linked to a fraternity of hunters in the city of Freetown. Such hunting fraternities are thought to have developed among the 'liberated Africans' brought to Freetown by the Royal Navy after being rescued from slave ships.

The Female secret society or 'sande' (found throughout the Central West Atlantic Region) is a women's initiation society. The Society initiates girls into adulthood by rituals including female circumcision. It is alleged by its supporters to confer fertility, instill notions of morality and proper sexual comportment, and maintain an interest in

SECTION 7: STAKEHOLDER PARTICIPATION

7.1 Objectives of Stakeholder Engagement and Information Disclosure

Consultations for this ESIA are consistent with provisions in the ESS10 and JICA Guidelines. The ESS10 provides the following objectives of the Stakeholder Engagement and Information Disclosure process:

- To establish a systematic approach to stakeholder engagement that will help borrowers identify stakeholders, build and maintain a constructive relationship with them, in particular, project-affected parties;
- To assess the level of stakeholder interest and support for the project and to enable stakeholders' views to be taken into account in project design and environmental and social performance;
- To promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them;
- To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible, and fair manner and format;

To provide project-affected parties with accessible and inclusive means to raise issues and grievances and allow borrowers to respond to and manage such grievances.

JICA includes stakeholder viewpoints into environmental and social decision-making processes by guaranteeing meaningful stakeholder participation in order to examine environmental and social factors and establish a consensus in a timely manner. JICA responds to questions from stakeholders. Participants in meetings are held accountable for what they say.

7.2 Principles of Stakeholders Engagement

An effective stakeholder engagement depends on mutual trust, respect, and transparent communication between the Project proponent and its stakeholders. Therefore, following the consultation framework is crucial for the success of the Project and the sustainability of investments in the long term. This will thereby improve decision-making and performance by:

Managing risk - stakeholder engagement helps the project proponent and communities to identify, prevent, and mitigate environmental and social risks and their impacts that can threaten project viability;

Avoiding conflict - understanding current and potential issues such as land rights and proposed project activities;

Improving national policy - obtaining perceptions about a project, which can act as a catalyst for changes and improvements in national policies formulation;

Identifying, monitoring, and reporting on impacts determining the impact of a project on stakeholders, analyzing and reporting on strategies to mitigate these effects; and

Managing stakeholder expectations - consultation with the stakeholders also provides the opportunity for the project proponent to know and manage stakeholder attitudes and expectations. Stakeholder engagement shall be informed by principles defining core values underpinning interactions with stakeholders. The project will comply with the following regulations based on international best practices include the following:

Commitment - demonstrated when the need to understand, engage and identify the stakeholders is recognized and acted upon early in the process;

Integrity - occurs when engagement is conducted in a manner that fosters mutual respect and trust;

Respect - created when the rights, cultural beliefs, values, and interests of stakeholders and affected communities are recognized;

Transparency - demonstrated when community concerns are responded to in a timely, open, and effective manner;

Inclusiveness - achieved when broad participation is encouraged and supported by appropriate participation opportunities; and

Trust - achieved through open and meaningful dialogue that respects and upholds a community's beliefs, values, and opinions

7.3 Stakeholder Engagement and Participation Strategy

The critical elements of the stakeholder engagement and information disclosure strategy for this Project will include the following:

Table 32: Consultations

Date	Place	Participants	Number of participants	Contents
17th December 2021	Funkia	Community leaders and community residents	23	To inform and enlighten on; Project objectives, Project components, the scope of the Project, likely significant benefits of the Project, and the purpose and relevance of the consultation.
17th December 2021	Ogoo Farm	Community leaders	8	To capture and comprehend; residents' perception of the Project, potential benefits and impacts of the Project, and suggestions on measures to lessen probable negative impacts.
17th December 2021	Lakka	Community leaders	5	
8th January 2022	Mile 13	Community leaders	8	
8th January 2022	Mambo	Community leaders and community residents	9	
8th January 2022	Bawbaw village	Community leaders	5	
15th January 2022	Tokeh village	Community leaders and community residents	15	
15th January 2022	York village	Community leaders	8	
15th January 2022	Black Johnson	Community leaders and community residents	12	

- disclosure of important Project related information by the implementing agencies and contracting entities on its website and at the appropriate local level and other disclosure procedures agreed with JICA
- a framework for consultation with the key stakeholders, including the affected communities, critical local leaders, etc. during planning, design, and implementation
- ensuring free, prior, informed consultation with the affected communities for obtaining broad community support during the preparation and implementation of the Project
- the establishment of Project GRM to meet specific grievance redress requirements of operations/Project

1.4 Details of Consultations Held

7.4.1 Stakeholder Composition

The following stakeholders were identified and consulted:

- The Western Area Rural District Council
- WARD councillors
- The Police
- Project Area Community Chiefs
- Community Chairmen
- Headmen
- Mamie Queens
- Youth Leaders

7.4.2 Invitation Procedure

Stakeholders identified for this Project were informed about the meeting through either formal letters, SMS text messages, or calls. Brief information on the Project, the Project objectives, benefits, and assumed adverse impacts were attached to the letter. Contact information (email address and phone numbers) were provided

7.4.3 Places and Date of Meetings

The meeting date and venue were agreed on in consultation with stakeholders. These stakeholders were very cooperative in providing the venue for these meetings. Consultation meetings were held at different locations and at different times.

Date	Place	Participants	Number of participants	Contents
15th January 2022	Adonkia Police Division, Adonkia	Support Officer	1	To inform and enlighten on; Project objectives, Project components, the scope of the Project, likely significant benefits of the Project, and the purpose and relevance of the consultation as well as importance of stakeholders' institution to the Project. And concerns.
21st January 2022	Ogoo Farm	RoW occupants (Adonkia, New Jersey, Ogoo Farm)	32	To inform and enlighten on; Project objectives, Project components, the scope of the Project, likely significant benefits of the Project, and the purpose and relevance of the consultation.
22nd January 2022	Mechkem Goderich	RoW occupants (battalion, Mechkem, college junction)	9	To capture and comprehend; participants' perception of the Project, potential benefits, and impacts of the Project, and suggestions on measures to lessen probable negative impacts. To understand from RoW occupants the extent to which they envisage the Project will affect them. And measures to cushion severe effects.
22nd January 2022	Tombo	Community leaders	16	To inform and enlighten on; Project objectives, Project

Date	Place	Participants	Number of participants	Contents
30th January 2022	Kent	Community leaders	5	Components, the scope of the Project, likely significant benefits of the Project, and the purpose and relevance of the consultation.
6th February 2022	Mammah Beach	Community leaders	2	To capture and comprehend; residents' perception of the Project, potential benefits and impacts of the Project, and suggestions on measures to lessen probable negative impacts.
6th February 2022	Bridget/PWD compound	Community leaders	5	
6th February 2022	Rusel	Community leaders and community residents	11	
13th February 2022	During town	Community leaders	5	
13th February 2022	Kerry town	Community leaders	2	
16th February 2022	Western Area Rural District Council	Environmental Social Officer and Deputy Chief Administrator	2	To inform and enlighten on; Project objectives, Project components, the scope of the Project, likely significant benefits of the Project, and the purpose and relevance of the consultation as well as importance of stakeholders' institution to the Project. And concerns. Discuss council's role in the Project implementation

7.4.4 Summary of Meeting Discussions

At the meetings, stakeholders from communities along the proposed power distribution line from Goderich to Tombo and Kerry Town were most likely to be affected by the Project as shown in the attendance list in the attached *annex v*.

After the opening courtesies of Muslim and Christian prayers and self-introductions, the head of the Mohapewa Social team informed participants that the meeting had been called to inform participants that the Government of Sierra Leone, through EDSA is applying for a loan from Japan International Cooperation Agency (JICA) to finance the Project of Extension of Power Distribution System Along the Freetown Peninsula. Yachiyo Engineering Co. Ltd (YEC) is contracted for the “Preparatory Survey for the Project of the Extension of Power Distribution System along the Freetown Peninsula”. YEC was to undertake the survey jointly with the Electricity Distribution and Supply Authority (EDSA), the Project’s proponent. Under this survey, YEC will be required to hire a qualified local consultant to assist EDSA in complying with environmental and social considerations required by JICA.

Consequently, YEC contracted the services of Mohapewa Co. Ltd to carry out an ESIA Study of the Project area, which involves consultations with the Project affected persons to elicit information from the people on various matters associated with their socio-economic status and living conditions. Accordingly, the Mohapewa team is in their community to carry out a Social Impact Assessment of their community which involves the conduct of a Focus Group Discussion meeting with key stakeholders in the affected communities and the random administration of a household survey to traders and residents along the power distribution line route that are most likely to be affected by the implementation of the proposed Project. Following these statements, the meeting transitioned into an open forum, in which the Mohapewa team addressed a series of questions to participants about their thoughts and concerns about the planned Project. The answers given by the participants were documented by Mohapewa staff and formed the basis of these minutes.

7.4.5 Stakeholder Concerns and Comments

The following are a summary of concerns during the consultation:

Table 33: Summary of Questions from participants and Responses from the consultants

Topic	Concerns/questions	Response from Consultant
About the Project and exact location of the poles	Where will the Transmission line pass? Left or right of the road? Where are the exact location of the poles?	Going from Goderich through the Peninsula to Kerry Town, the distribution line poles will be on the left of the main road The poles will be located on the RoW
	What dimension of each pole?	The pole dimension is 1 by 1 metre
Commencement of Construction work and Duration	When will construction work begin? How long will construction work last?	Construction work will commence after securing the EIA Licence The Project will last for one year and six months (18 months)
Employment Opportunity	Will the contractor consider youth employment in the communities along the RoW?	The policy emphasises that operators or contractors give first consideration to Sierra Leoneans, especially those in the Project area

Project completion date?	When will the Project be completed and we start enjoying the light?	The Project is expected to be completed within a year and half
Completion of ESIHA Report	when will the ESIHA report be completed	The report will be completed by the end of February 2022

Electricity connectivity to Communities along the transmission line	Will all the communities along the transmission line be connected to the transmission line?	There will be primary substation (existing) (S/S) to Tombo Substation (S/S) (Approx. 50km) and 11/0.4kV Distribution Transformer (100-500kVA) (Approx. 28 lots) for the communities
	Will the Project also provides meter for the communities?	No, the distribution of meters is not part of this Project. Meters are bought at designated outlets in Freetown.
	Who will sell electricity to consumers?	Distribution and selling of the electricity generated will be done by EDSA to consumers through pre-paid meters.
Compensation Payment.	Will compensation be paid to those whose structures and/or businesses are affected?	Yes. A resettlement plan will be prepared that will determine affected persons and the required compensation.
	If one has legal documents for structure along the RoW, will he/she be compensated?	The RoW belongs to Government. However, if one has a document for the structure, you will bring it forward for examination and onward submission to the appropriate authorities. However, all affected occupants of RoW will be compensated.
	What type of traders or houses will you compensate?	The transmission line will pass along the government RoW. The Project footprint is very minimal. Compensation at this stage is not guaranteed

The following table presents a summary of responses from participants during the Focus Group Discussion meetings:

Table 34: Summary of Responses from Focus Group Discussion Meetings

Category	Question	Summary of Response(s)
Knowledge, Perception and Challenges	Do you know about the Goderich-Samuel Town Transmission Line Project?	About 70% of the participants were not aware of the Project
	What is your understanding of the Project?	To provide an uninterrupted electricity
	How do you feel about the Project? (positive, negative, mixed); * ask them to give reasons for how they feel, and list them*	All the participants said they feel very good about such a Project. It will lead to improvement in the quality of life
	What challenges do you foresee in the Project?	Worries about the completion of the Project include low voltage, stealing of cables, high tariffs
Livelihoods	How would you want those challenges to be addressed?	Community engagement and vigilance
	What are the main livelihood activities engaged in this community?	Trading, fishing, quarrying, sand mining, local administration
	What is the range of monthly income generated from livelihood activities?	Three main monthly income brackets were identified: Low-income earners (Le 400,000 to 1 million) Middle-income earner (between Le 1 million - 3 million) Middle-income earner above Le 3 million
	Do you think your livelihoods will be affected in any way by the Project? Good or bad? Give reasons.	It will be affected in a positive way. Most of the participants believe that the Project does not have any negative impact on their livelihood. However, traders on the RoW fear that their businesses will be affected.

Category	Question	Summary of Response(s)
Positive expectations from Project implementations	If bad, how do you think this can be mitigated?	Not applicable
	What do you think is/are the positive expectations from the Project?	Perceived benefits from the Project highlighted by the communities include: Land will appreciate, as more people would come to buy land; Employment opportunities will become available; Educational and health facilities will be improved; Compensation for traders along the RoW will increase business activities. Improved social facilities; Business activities within the communities will increase, and Improved access to the communities by NGOs and other development organizations.
Negative expectations from the Project	What do you think is/are the negative expectations from the Project?	Potential negative impacts of the Project listed by participants include: Increased crime rates as population increases; Influx of people into the communities to settle or in search of jobs and business opportunities resulting in encroachment on the limited social facilities and contributing to the incidence of STIs in the affected communities
Land Acquisition	How Long have you stayed/done business on the land?	Between 1 to 20 years
	How did you acquire the land/business site?	Private, lease and government (WARD C)
For Communities without Electricity	Do you have legal documents for the use of the land?	Most respondents outside the RoW have legal documents, while those on the RoW alleged that land was leased to them by Western Area Rural District Council

Category	Question	Summary of Response(s)
	How do you think the Project will positively impact livelihood?	It will improve trading activities, health, education and social life, fish and food preservation.
	How much do you spend on lighting a home in a month?	Monthly expenditure on lighting homes ranges between Le 20,000 to Le 150,000

SECTION 8: PROPOSED PROJECT IMPACTS AND BENEFITS ENHANCEMENT

This section presents the assessment of potential environmental (physical and biological), community health and safety, and social implications related to the Project's construction and operation, as well as mitigation methods to reduce the risk of those impacts.

8.1 Positive Impacts

The extension of power distribution system along the Freetown Peninsula is envisioned to have a significant positive impact on the livelihood of the residents and also on the environment. The potential positive impacts of the proposed activities of the Project are discussed below.

8.1.1 Reduced Indoor Pollution

It is envisioned that improved access to electricity by business units and households will reduce the use of biomass energy (fuelwood, charcoal) as an energy source for cooking and drying. This will directly reduce the percentage of respiratory diseases at the local level. Research shows that 95% of Sierra Leoneans depend on crude fuel, including wood and charcoal (Taylor and Satoshi, 2012). The provision of electricity in homes and restaurants will reduce the use of firewood and charcoal. Cooking with firewood and charcoal causes indoor pollution. This has been highlighted as a significant cause of respiratory diseases among women and girls in Sierra Leone, which sometimes causes unexplained deaths. Therefore, electricity will reduce such deaths.

8.1.2 Improved Security

Darkness often results in insecurity. With the improved availability of light in remote parts of the Freetown Peninsula, security would be improved. The lighting in and outside residences would contribute to the security of residences and investments that may have positive economic impacts on individuals and households in the Project area.

8.1.3 Improved Delivery of Social Services (Health and Education)

Improving electricity to health facilities and schools will accelerate the improved delivery of services in these two sectors. A complete transformation will be achieved in the maternity wards and the general hospital administration. Women will no longer deliver under darkness. Surgical operations will not face the blackout challenges. Improving the preservation of vaccines, the health of women and children, and reducing infant mortality are expected.

Opportunities will be created in schools for pupils to have more productive hours in school libraries and even at home where study times are often interrupted with blackout or the use of lamps and candles will be a thing of the past. Pupils will have extended hours of study time, and if affordable, they will have the opportunity to use personal computers and access the internet in their homes and/or schools. This energy availability is especially significant in contributing to human capital and socioeconomic development.

8.1.4 Job Creation Opportunities and Increased Economic Activities

During the construction phase, direct job opportunities will be created for semi-skilled and unskilled labourers in the local communities, leading to many indirect benefits expected in the Project area due to the need for more supportive services to the workers and contractors. Accommodation, food, transportation, and security are just a few examples of services that could be covered. The Project plans to employ locals to carry out most of these tasks that may not require too much-skilled labour. This impact is positive and will affect local retail business owners who would mainly benefit from secondary effects of increased incomes and spending power of construction workers.

8.1.5 Improved Livelihoods

A direct benefit of electricity is the availability of heating and cooling that would adjust temperatures and make life comfortable. Generally, electricity will improve the locals' living standards, including preserving food by using refrigerators. The lack of reliable electricity prevents using household items such as refrigerators and television sets. During consultations, several households with such household items complained that utilization of these is being hampered by poor electricity access. The people welcomed the Project, emphasizing that it would enable families to acquire and buy perishables, which would help improve their livelihoods.

8.1.6 Incentives for Small-Scale Enterprises

The youths and young adults today find it difficult to get jobs. The trend is that they see small the setting up of small businesses as a way out of the poverty trap. Thus, they now run income-generating businesses such as saloons, barbershops, restaurants, and mini-shops for food and groceries. However, the operations of these businesses are hampered due to the lack of electricity, and many have abandoned their businesses. The provision of electricity to these areas will increase the business opportunities and income to many individuals and hence contribute to the improvement of livelihood.

8.2 Potential Negative Impacts

Some potential negative impacts have been identified by looking at similar projects, field observations, and consultations with different stakeholders. These negative impacts are likely to be observed during and after implementing the Project activities.

Impact Assessment Methodology

Impact prediction has been made by analyzing different Project activities and envisaging possible environmental changes using established standards and specialist judgements. Four generic rating scales were used for this study's assessment. These are:

- i. Duration
- ii. Extent
- iii. Magnitude and
- iv. Likelihood

Duration

Duration describes at which stage of the Project is the impact likely to occur.

Table 35: Period of Impact Rating

Rating	Description
Short-term	Construction Phase
Medium-term	Operational Phase
Long-term	The impact will only cease after the operational phase
Permanent	Where the impact will occur even after the Project decommissioning activity

Extent

Table 36: Extent of Impact Rating

Rating	Description
Local	Limited to the Project site and its close surroundings
Regional	The impact extends beyond Project boundary
National	The Impact extends countrywide

Magnitude

The magnitude of the impact describes the severity of an impact based on the extent to which the impact would change under existing conditions or how it would impact another receptor.

Table 37: Magnitude of Impact Rating

Rating	Description
Negligible	There is no discernible influence on the environment, and there is no discernible change in people's lifestyles
Minor	The influence has such a minimal impact on the environment that natural functions and processes are unaffected, and communities are able to adapt
Moderate	Where the impacted environment has been transformed but natural functions and processes have continued, although in a modified form, or where communities have been able to adapt despite certain challenges
Major	When natural functions or processes are disrupted to the point where they will cease to exist temporarily or permanently, or the communities affected will be unable to adjust to the changes

Likelihood

Likelihood describes the probability of the impact occurring.

Table 38: Impact Probability Rating

Rating	Description
Unlikely	The possibility of the impact occurring is extremely low or non-existent
Likely	There is a possibility that the impact will occur
Very likely	The impact will definitely occur

8.2.1 Loss of Land, Assets and Livelihood

EDSA shall acquire the RoW for the distribution line route from the SLRA. There is a likelihood that crops would be affected during construction, and disturbances will be made to traders who reside along the RoW. Therefore, adequate compensation shall be done for any affected crops and disturbances. It is not likely at this point that resettlement would be done; hence, a Resettlement/Livelihood Plan is proposed.

The restriction of access to land and land use under the RoW may be classified as a residual impact. This restriction of access to the RoW is necessary for the safety of both the distribution line and the public.

8.2.2 Impact on Flora and Fauna

The proposed distribution line runs along an existing road; therefore, there will be no need to clear the line route to access pole spots. The proposed pole location could be easily accessed from the road. Clearing can only be done for the pole footprints. No clearing would be required for the Tombo primary substation as it sits in an open field. At present, the primary substation sites are cleared of vegetation. It is also likely that vegetation shall be removed. It is also expected that vegetation could be destroyed through trampling and compaction by vehicles and machines. The EPC contractor would need a storage camp along the route for storing construction materials. This site is not yet known, and the site will likely involve vegetation clearing. However, clearing of the vegetation will not reduce forest cover in the WAPNP. It would expose some fragile micro-habitats trees and undergrowth plants species vulnerable to local extinction, especially in the face of already stressed vegetation characterized by intensive and extensive clearing for housing development.

No particular impact of the Project can be associated with wildlife, including mammals and birds. Therefore, no loss of biodiversity, especially for mammals and birds, is envisaged because the sites do not have significant vegetation that supports significant and threatened wildlife. This is due to the fact that much of the work will not overlap with the forest edge where threatened species were recorded. In any case, some small mammal species such as the cane rats and giant pouch rats may be affected, though there are many alternative habitats for such categories of species.

8.2.3 Soil Contamination and Erosion

The Project's pre-construction and construction activities will require site clearance to establish a works yard, digging of foundation pits for poles,

mobilization/transportation of construction materials and workforce. During Project decommissioning, substation sites and distribution lines will be cleared.

The potential impacts will be due to soil structure and soil quality from soil excavation or compaction. The soil characteristics and type of construction activity determine the magnitude and extent of the impact. Soil compaction during the backfilling of excavated soils may lead to temporary effects on the natural infiltration of rainwater. However, these impacts are temporary, localised and marginal.

8.2.4 Water Contamination

The Project route crosses water bodies. During construction, operation and decommissioning, there is a high risk of contamination of these surface water bodies from the following activities:

- Run-off from excavation;
- Run-off from dampening systems to control dust emissions;
- Disposal of waste materials; ;
- Sanitary effluents from the construction workers' camp and substation locations;
- Oil and chemical spills;
- Washing of vehicles and other machinery;
- All other activities causing soil contamination discussed earlier can also cause water contamination.

8.2.5 Solid Waste

Solid wastes to be generated during construction activities and stringing of cables include construction wastes, food/packing materials littered by workers, scrap copper wires, cables, etc. Wastes, if not managed, can be spread all over the sites and outside the Project footprint. These can contaminate surface water bodies flowing in proximity to the construction sites.

During the operation of the primary substation sites, workers may generate domestic and office wastes. The dismantling of the facilities (substations and distribution lines) during the Project decommissioning may also generate solid wastes.

There is no designated waste dump site in all Project communities. The closest is at Waterloo, around 8.3km from Kerry Town.

8.2.6 Concerns Related to the Management of Hazardous Materials

Insulating oils/gases (e.g., Polychlorinated Biphenyls [PCB] and sulphur hexafluoride [SF6]) and fuels, as well as chemicals, are hazardous materials in this industry. Insulating oil or transformer oil is often used in the operation of oil transformers, which also includes transport, storage, filling, handling of oil in the operation of various devices and managing used oil. Waste transformer oils at primary substations are generally generated during replacement with new oils and damage to the power transformer may cause the discharge of transformer oil into the environment. If not handled safely, these oils shall pose a risk to the environment by polluting water, soil, and air and the life and health of people. These risks may be hazardous if waste insulating oils run into water flows that supply settlements with drinking water.

8.2.7 Fire Hazards

On the grounds of substations and work sites, the existence, storage, and use of oils, fuels, and other combustible goods may provide a significant risk of fire outbreaks. Furthermore, fire outbreaks are always a possibility in substations and work sites that are located in areas where flammable materials are stored.

8.2.8 Impact on Air Quality

There is a likelihood of impact from emissions from vehicle exhaust and dust from construction and decommissioning, leading to poor air quality. During construction, it is not expected that the numbers and frequencies of truck movements will increase, and 95% of the route is tared. Therefore, the impact on emissions and dust from truck movement will be of no significance. The erection of poles and stringing of conduits are not expected to create much dust. Also, construction activity at the proposed Tombo primary substation site might generate significant particulates. However, the excavation for pole foundations could cause localized high levels of dust because of the loose nature of the soil and its close to dwelling houses.

The following is expected during construction:

- Emissions of oxides of nitrogen (NO_x in particular) and carbon monoxide (CO) mainly from construction-related vehicles [and to a lesser degree from construction generators and other hydrocarbons (HC) powered equipment]; and
- Dust and particulate matter (as PM_{2.5} and PM₁₀) will be created by construction-related vehicle traffic on unpaved roads.

This impact may last during construction. Once the distribution line is built and operational and the RoW reinstated, no significant effects on air quality are anticipated. As a result, the impact on air quality from emissions and dust is expected to be of medium severity.

8.2.8 Impact on Noise and Vibration

During construction and decommissioning activities, potential noise sources may include the on-site movement of vehicles and machinery. During the construction and decommissioning phases, the quantity and frequency of truck movements would not significantly increase. The erection of poles and stringing of conduits are not expected to create huge noises. However, the excavation of pole foundations could generate a very high noise level. Foundations would likely be dug manually. Some pole spots are close to settlements. These would have a nuisance effect on the nearby human settlements. However, the impact of noise will last for a short period.

8.2.9 Labour and Occupational Health and Safety (OHS)

Environment and Social Standard 2 (ESS2) requires that workers' health and working conditions be considered important in the workplace. They are treated fairly and in a non-discriminatory manner and treated with equal opportunity. The Project will employ direct workers, contract staff, and primary supply workers as appropriate. Key labour risks will include non-transparent and discrimination in the recruitment process, poor terms of employment and working conditions, lack of protection for vulnerable workers (e.g. women and persons with disabilities), forced and child labour, labour grievance, inadequate employment OHS protection etc. Most occupational health and safety issues arise during the construction and operational phases of electric power distribution lines, prevention and control, are well documented and practised by EDSA. Exposure to live power lines, working at height, and chemical exposure are among the occupational health and safety dangers unique to electric power transmission and distribution installations. The exposure to physical hazards from the use of machines; trip and fall hazards; exposure to dust and noise; falling objects; work in confined spaces; exposure to hazardous materials; and exposure to electrical hazards from the use of tools and machinery, among other things, are some of these consequences.

Workers are susceptible to contracting COVID-19 and pass it on to their co-workers. Close contact with a co-worker or a member of the public who has COVID-19 is a potential source of exposure.

8.2.10 Community Health and Safety

Construction activities would involve the movement of trucks, which move sporadically and can cause road accidents if precautions are not taken. The erection of poles could include falling objects, but not common/expected as the public shall be kept away from the sites. However, the impact on public safety from road accidents and falling objects from construction sites is of low severity. There is a medium to high flow of traffic along the Project route, and motorcycle (okada) transportation is a widespread method of transport between Baw Baw and Tombo. These motorcycles may be susceptible to the trucks equipped with cranes used to transport construction machinery on these roads.

8.2.11 Impact on Cultural/Archaeological Resources

Cultural resources are non-renewable resources critical to human existence, history, and culture. Cultural/archaeological sites are places and objects of beauty, cultural, historical, scientific, social, or spiritual value. The substation sites and distribution line route does not fall in any known cultural and archeologic sites. However, there is a probability that a find will be made during the excavation of pole and substation foundations. The proposed site for the secondary substation at York contains relics of an old bus station. The construction works shall not tamper with these relics. However, should construction workers encounter any archaeological/historical importance find, a chance find procedure has been proposed in *Annex ii*. The impact on archeologic and cultural sites is considered of no significance.

8.2.12 Concerns related to the Influx of Population

a) HIV/AIDS Concerns and COVID-19

According to the 2019 Sierra Leone Demographic and Health Survey (SLDHS), the country has a mixed and generalized HIV epidemic, with a prevalence of 1.7%. The SLDHS further indicates that HIV prevalence is higher in urban areas than in rural areas (2.3% versus 1.2%). During construction, workers may move to communities and reside for some days. The interactions between workers and the local communities may bring about new Acquired Immunodeficiency Syndrome (AIDS) infections on either side.

COVID-19 has spread to all districts in the country. On 13th March 2020, Sierra Leone recorded its first case of COVID-19. As of February 25 2022, the country has confirmed 7,665 cases of COVID-19 and 125 deaths within its borders. Currently, the rate of confirmed cases has reduced. Job seekers are likely to contract COVID-19 and transmit it among residents and construction workers.

b) Gender-Based Violence (GBV) and Sexual Exploitation and Abuse (SEA) During construction, the presence of external workforces, higher wages, and search for jobs and procurement opportunities may contribute to an increase in Sexual Exploitation and Abuse, and Sexual Harassment (SEA/SH) risks for women and girls. Projects create changes in the communities they operate and can cause shifts in power dynamics between community members and households. Male jealousy, which is a fundamental driver of GBV, can be generated by a labour influx on a project where employees are suspected of engaging with community women. As a result, abusive behaviour is possible between Project-related staff and those living in and around the Project site and within the homes of those affected by the Project.

However, the concerns related to the influx of population will only last during the construction period, which will last for a short period.

Table 39 summarises the potential negative impacts of the proposed Project.

Table 39: Summary of Potential Negative Impacts

Impact	Phase of Concern	Duration	Extent	Magnitude	Likelihood
Loss of Land, Assets and Livelihood	Construction	Long term	Local	Minor	Likely
Loss of Vegetation	Construction	Long term	Local	Minor	Likely
Soil Contamination and Erosion	Construction	Short term	Local	Minor	Likely
Water Contamination	Construction, Operation & Closure	Short term	Regional	Major	Likely
Solid Waste	Construction, Operation & Closure	Short term	Local	Major	Very Likely
Hazardous waste	Construction & Operation	Short term	Local	Major	Very Likely
Fire Hazard	Operation	Short term	Local	Major	Likely
Impact on Air Quality	Construction and Closure	Short term	Regional	Major	Very Likely
Impact on Noise and Vibration	Construction and Closure	Short term	Local	Major	Very Likely
Labour and Occupational Health and Safety (OHS)	Construction and Operation	Short term	Local	Major	Very Likely
Community Health and Safety	Construction	Short term	Local	Major	Very Likely
Impact on Cultural/Archaeological Resources	Construction	Short term	Local	Major	Unlikely
Concerns related to the Influx of Population	Construction	Short term	Local	Minor	Likely

SECTION 9: IMPACT MITIGATION MEASURES

The section provides mitigation measures for the identified potential negative impacts from the previous section for use in the Project. There are no mitigation measures for positive impacts.

9.1 Impact Mitigation Measures

9.1.1 Loss of Land, Assets and Livelihood

The 1991 Constitution of Sierra Leone and several other provisions makes provision for the acquisition of land by the GoSL for construction of public facilities like a transmission/distribution line and pay appropriate compensation.

The Project land take is very minimal. The two primary substations are to be constructed at York and Tombo, and 28 secondary substations will be built on government, community and private properties. The Project is only expected to displace (shift of structure) a makeshift structure at Tombo. The distribution line route will be constructed along the RoW. There are some business structures along the RoW, especially the existing distribution line from Goderich substation to Sussex. A Resettlement Framework has been prepared, which recommends that the Project undertakes a resettlement/livelihood plan to be prepared following ESS5.

Resettlement and Compensation Entitlements Principles

The resettlement and rehabilitation principles adopted for the Project will follow the Constitution of Sierra Leone, other Sierra Leonean laws, JICA Guidelines and the World Bank ESS5. The World Bank policies provide compensation at replacement cost, resettlement, and rehabilitation assistance to all Project-affected persons (for the loss of land, residences, business establishments), including the informal dwellers/squatters on the RoW. The basic resettlement principles and guidelines include:

- Avoid involuntary resettlement where feasible, or minimization, exploring all viable alternative project designs.
- Affected persons shall be meaningfully consulted and provided the opportunities to plan and implement resettlement programs.
- Assist affected persons in their efforts to enhance their livelihoods and living standards, or at the very least return them to pre-displacement levels in actual terms. Inform affected persons about their rights/options about land acquisition/resettlement.

- Provide prompt and adequate compensation at full replacement cost (without deducting depreciation or salvage value) relating to assets losses solely due to the project
- All PAPs are eligible for compensation for lost assets and livelihood irrespective of title to land ownership.
- Compensation and Rehabilitation assistance will be paid before displacement.
- No civil works will be initiated unless compensation for land and assets and rehabilitation assistance is provided to all eligible PAPs.
- Provide special measures and assistance for vulnerable groups.
- An appropriate grievance redress mechanism will be established at multiple levels to ensure speedy resolution of disputes if any.
- All activities related to resettlement planning, implementation, and monitoring would ensure the involvement of women. In addition, efforts will be taken to ensure that vulnerable populations are represented. Funds will be set aside in the budget for those who were not present at the time of enumeration. However, anyone moving into the Project area after the cut-off date will not be entitled to assistance.

The JICA Guidelines states that:

1. Involuntary resettlement and loss of means of livelihood are to be avoided when feasible by exploring all viable alternatives. When, after such an examination, avoidance is proved unfeasible, effective measures to minimize impact and to compensate for losses must be agreed upon with the people who will be affected.
2. People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported by project proponents etc. in a timely manner. Prior compensation, at full replacement cost, must be provided as much as possible. Host countries must make efforts to enable people affected by projects and to improve their standard of living, income opportunities, and production levels, or at least to restore these to pre-project levels. Measures to achieve this may include: providing land and monetary compensation for losses (to cover land and property losses), supporting means for an alternative sustainable livelihood, and providing the expenses necessary for the relocation and re-establishment of communities at resettlement sites.
3. Appropriate participation by affected people and their communities must be promoted in the planning, implementation, and monitoring of resettlement action plans and measures to prevent the

loss of their means of livelihood. In addition, appropriate and accessible grievance mechanisms must be established for the affected people and their communities.

4. For projects that will result in large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public. In preparing a resettlement action plan, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people. It is desirable that the resettlement action plan include elements laid out in the World Bank Safeguard Policy, OP 4.12, Annex A.

9.1.2 Loss of Vegetation

The following mitigation measures shall be followed:

- The World Bank ESS6 on Biodiversity Conservation and Sustainable Management of Living Resources is an important mitigation measure before mitigating the negative impacts. The Bank's ESS6 supports the protection and conservation of biodiversity and sustainably managing living natural resources as these are fundamental to sustainable development.
- Therefore, cutting down trees will be avoided where possible. However, where it will be necessary to cut down trees.
- Owners of affected tree crops or plantations should be duly compensated

9.1.3 Soil Contamination and Erosion

The following measures should be followed:

- To minimise the impact on the soil material from contamination, it is recommended that soils should be placed away from streams of water along slopes or in direct line with local drainage;
- Loose soil should not be left uncovered before backfilling and the excess soil should be removed after poles are cast;
- Construction activities should be planned in the dry seasons as that will minimise rainwater run-off or any loss due to infiltration. If the digging is done during the rainy season, care should be taken to ensure that all dug holes are filled before the next rainfall. This should be done by digging only holes that can be filled within a day. Holes should not be left unfilled over several days during the rainy season as this may lead to the dug soil being eroded;

- And, if holes are poorly compacted, loose soils may be eroded, leading to siltation of drainage channels. This will be mitigated through proper compaction of the pole holes;
- construction materials shall be stored within the Project footprint area. The movement of materials and manpower shall be restricted to designated tracks/roads.

9.1.4 Water Contamination

The following measures are proposed:

- Construction works near water bodies will be carried out, ensuring that no debris or excavated soil falls into the surface water bodies;
- Oil and water separators and settling ponds will be installed where appropriate to minimize the risk of contaminated construction water entering water bodies or groundwater;
- Construction activities should follow the appropriate measures to avoid and contain any spillage and pollution of the water;

9.1.5 Solid Waste

The following applies for general solid waste management:

- Disposal of installation, construction and related waste materials at designated and approved waste dump site;
- Adoption of waste minimization measures;
- Incorporation of a waste management plan in Project planning and EPC contract specifications;
- Collaboration with relevant local authorities to enforce appropriate sanitation and other bylaws;
- Speedy reclamation of waste disposal and borrow area sites.

9.1.6 Concerns Related to the Management of Transformer Oils

The presence of transformers on substation grounds presents the environmental risks associated with transformer oils. Transformers normally contain Polychlorobiphenyls (PCBs) have been found in a number of transformers' electrical insulating mineral

lubricants. PCBs are hazardous to the environment. During substation operation, transformer oils should be collected and disposed of appropriately.

The transformers to be acquired must comply with all applicable safety regulations and must be housed in separate secondary containment structures to prevent any accidental spills or routine leakages from entering the environment. Transformers should be serviced by qualified personnel.

- At the minimum, the following shall be followed: Insulating oil must be treated with extreme care to prevent any contamination. The most common contaminants are water, solid particles, and chemical solvents. Water and solid contaminants are the easiest to filter, while separating chemical solvents is almost impossible;
- Storage facilities designed for receiving insulating oil in bulk must have dedicated hoses, lines, pumps and tanks. A system for re-drying and filtering the oil must also be provided;
- The insulating oil must be tested for DDF, IFT, breakdown voltage, moisture, acidity, conductivity, and PCB levels upon delivery and prior to acceptance. Facilities for testing insulating oil must also be available so that oil can be tested upon delivery and prior to approval;
- ETS 0010-New mineral insulating oil;
- ETS 0032- New natural ester insulating oil;
- ETS 0029 Regenerated mineral insulating oil;
- Insulating oil must always be stored within a banded area complying with GPE 0075;
- If possible, it is also necessary to construct a transformer oil pit collector that would prevent oil spills from the transformer into the environment in case of emergencies or accidents.

Fire Hazard

The greatest way to prevent fires is to prevent them from starting in the first place. Fires have been reported at EDSA facilities at Lumley substation and along the line routes from Lumley to Wilberforce, especially after severe rains and winds. These outbreaks caused extreme damage to EDSA facilities, although fatality was not recorded.

Prior to the substations' operation and as part of the Project execution, EDSA should conduct a fire survey on each substation's grounds to identify specific firefighting equipment. In addition to the usual water hydrants and fire extinguishers provided

for all substations, these pieces of equipment must be located at vantage points within the substations. This will ensure that substations maintain a high level of preparation in the event of a fire. In addition, tall tree pruning and vegetation clearance along the distribution line route must be done quarterly. Additionally, fire buffers must be built and maintained outside the perimeter of the fencing to ensure that possible fires from non-insulated overhead cables and poles do not impact the substations and poles.

9.1.7 Impact on Air Quality

The following measures are proposed:

- Vehicles and machinery should be operated and maintained according to the manufacturers' specifications;
 - All vehicles and heavy equipment working on the site should be effectively maintained. Any vehicle that has high smoke at the construction sites and is visibly detected should be promptly repaired;
 - Limiting trucks and other vehicles speed on-site;
 - Construction materials and stockpiles of material should be carefully managed to minimize the risk of windblown material and dust;
 - Removing excavated material promptly;
 - The Project should develop a dust management plan;
 - Avoid runoff of mud and water and maintain drains in a clean state;
 - Remove dusty materials from the site as soon as possible if not being re-used. If being re-used, cover or vegetate if possible;
 - Minimise drop heights when loading stockpiles or transferring materials; and
 - Impose speed limits on haul routes and construction compounds to reduce dust generation.
- WHO air quality guidelines are generally considered in Sierra Leone.

9.1.8 Impact on Noise and Vibration

For general measures to reduce the impact on surrounding establishments nearby the construction sites, the measures are:

- Prior to the preparation of the transmission line construction, the communities shall be informed of the Project activities and the duration of the Project.
- A clear sign for construction sites labels and warning signs should be placed. The signs should be clear during the night as well.
- The construction should be done during the day (between 7 AM to 5 PM).

For mitigation measures of construction workers and the general public within and close to the construction site, it could be mitigated by applying the normal precautions normally taken by construction labour and specific measures to minimise public nuisance. The safety measures have to be taken for standard protection of the construction workers and according to the HSE general guideline of International Finance Corporation (IFC); also, the schedule of the machinery used for the construction activities and for transporting the equipment or materials should be managed properly.

According to the IFC General EHS Guidelines, the mitigation measures that should be implemented are the following:

- Without hearing protection, no employee should be exposed to noise levels greater than 85 dB(A) for more than 8 hours a day. Hearing protection should be able to reduce sound levels at the ear to at least 85 decibels (A). When the equivalent sound level over 8 hours hits 85 dB(A), peak sound levels approach 140 dB(C), or the average maximum sound level reaches 110 dB, hearing protection should be vigorously enforced (A). Limiting the duration of noise exposure.
- Construction of the structure and installing the equipment should be conducted during the daytime.
- The management of the use of heavy machinery and the equipment (at the same time and concentrated at the same place) to avoid vibration accumulation.

9.1.9 Labour and Occupational Health and Safety (OHS)

The Environment Health and Safety (EHS) document should be used to guide the overall management of Occupational Health and Safety (OHS) issues. In summary, the mitigation measure shall include:

- Contractors to adapt the Labour Management Procedures on *Annex i* to ensure the availability of clear recruitment protocols, written employment contracts with clear working conditions, protection of vulnerable workers, prohibit the use of forced and child labour, availability of Grievance Mechanism for workers complaints etc.
- All workers need to be provided with the recognized and appropriate Personal Protective Equipment (PPE) while at the construction site, including hardhats, gloves, and safety belts for climbing up the poles, boots, and overalls. Use of PPE will have to be strictly enforced;

- Only competent workers and staff should be allowed to operate any machinery and equipment to reduce the incidents of accidents;
- During the construction, the Project site should be completely sealed off and warning signs erected informing the public to keep off the construction site when construction is in progress;
- The EPC contractor should continuously train his staff or conduct refresher training to ensure that the staff is up-to-date with new or latest equipment knowledge.
- The health and safety of workers are fundamental in this Project, and therefore, all measures to avert health and safety challenges should be respected by contractors. The spread of HIV Aids and COVID-19 has been a potential risk to the Project, and thus, the entire public health preventive measures presented below should be strictly adhered to.

It is specifically important to maintain the following during excavation and trenching. These are:

- All excavations must be carried out in conformity with authorized plans. All excavations with sides that could expose personnel or facilities to danger from shifting earth must be protected by providing a slope to the appropriate angle of repose or benching in the sides and ends of the excavation, or by using and securing ladders that can withstand at least 1 m above the top of the excavation. All excavations deeper than 0.5 m must have barriers and toe boards around the outside to prevent persons and material from falling into the excavation. Barriers must be strong enough to resist the weight of a person crashing through them. Barriers must be visible at all times of the day and night.
- Everyone working in the excavation must wear safety helmets and boots.
- Vehicles and other machinery or construction equipment must not approach an excavation within 2 m unless they are involved in the excavation.

The following shall also be maintained for mechanical equipment:

- All mobile mechanical equipment must be operated by authorized workers who are in possession of a valid license
- Qualified staff must inspect all equipment prior to usage..
- Brakes, lights, tyres and batteries shall be inspected before using the equipment. Revolving lights must be used for heavy-duty vehicles.
- Any equipment's design capacity must never be exceeded. No changes to the equipment's capacity are permitted.

9.1.10 Community Health and Safety

The substations are mostly located within settlements. Because of the high voltages that the stations must handle, it is critical that they be maintained secure at all times and that unauthorized individuals stay away. The substations shall be suitably fenced to ward off persons from the premises. Padlocks shall be well maintained on the entrance to the substations. Also, security officers shall man the substations at all times to ensure security and report all incidents that might be out of the ordinary for prompt action. In addition, suitable warning signs indicating the dangers within shall be placed at regular intervals on the fencing to warn would-be encroachers.

The mitigation measures to address the Project impacts on communities' health and safety are:

- Construction works yard should be located farther away from communities;
- Covid-19 guidelines should be followed;
- The project should develop a Traffic Management Plan that will also address traffic safety for communities;
- The communities should be informed about the nature of construction activities and the associated health and safety risks; awareness-raising of the communities will be carried out for this purpose with the help of training sessions, posters, signage, and other similar means;
- Awareness-raising of communities will be carried out, in a culturally-sensitive manner, about infectious diseases, including sexually transmitted infections;
- The construction sites/ works yard should be fenced as appropriate to minimize entry of the local communities, particularly children in the work areas;
- Barricading tapes should be placed around dug holes for risk of residents falling into them;
- The GRM established should address community grievances related to health and safety.

9.1.11 Impact on Cultural/Archaeological Resources

- Electric energy generation and distribution facilities will avoid alignments and locations that passes through known cultural sites.
- Cultural resources discovered during construction will be turned over to the National Museums and Monuments Authority for preservation. When cultural resources are found (chance find) during works, the work should be stopped and the National Museum and Monuments authority invited to excavate and remove the artefacts.

- Salvage excavation and relocation of artefacts or ruins from a cultural site;
- Collaboration between EDSA and the Museums and Monuments authorities in determining and preventing cultural site and resource degradation; and
- During the construction era, identifying and protecting important cultural sites.
- The World Bank chance find procedure shall be incorporated in the contract documents to deal with a chance find of artefacts for example, in borrow areas, route alignment excavation, etc.

9.1.12 Concerns related to the Influx of Population

The following principles will be followed in assessing and avoiding, minimizing and/or mitigating labour influx:

- Tapping into the local workforce by adopting recruitment criteria that is transparent and fair to local communities;
- Advertising upcoming opportunities through the local media;
- In consultation with local authorities, prepare a roster of interested workers and their skills to identify a suitable labour pool locally;
- Provide a list of the local labour pool to contractors at pre-bid meetings for recruitment consideration;
- Train local staff in a timely manner to accomplish Project requirements (if such trained staff are needed afterwards for the operation and maintenance of the infrastructure);
- Limit work permits for workers with skills unavailable locally;
- Prohibit contractors from hiring onsite and instead set up formal recruitment offices to discourage Project "followers" from loitering and/or settling around the Project site in the hope of job opportunities;
- Institute a working Project-level GRM that is known to and accessible by the host communities to manage labour influx related risks

The following threats of labour influx can be mitigated thus:

- a) COVID-19 and HIV Mitigation Measures
- EDSA and the EPC contractors shall implement the following COVID-19 safety measures according to the regulations issued by the National COVID-19 Emergency Response Centre (NaCOVERC).

Additionally, WHO guidelines on 'Getting your workplace ready for COVID-19' can be accessed on <https://www.who.int/docs/default-source/coronavirus/advice-for-workplace-clean-19-03-2020.pdf>

- At all levels of management, there is a commitment to ensuring that required budgetary allocations are provided for HIV/AIDS issues, as well as that the national HIV/AIDS policy is executed as intended.
- HIV/AIDS provisions shall be integrated into current labour relations rules and regulations to the extent possible..
- A workplace HIV/AIDS prevention and treatment policy will be implemented. Information about the HIV status of workers in the sector would be handled with caution and confidentiality. Workplace programs on HIV for electric energy contractors will be established and will include preventive activities through:
 - o Advocacy through the dissemination of information, education, and communication; counselling and peer education;
 - o promote condom use
 - o Support and counselling for persons living with AIDS (PLWAs)

b) Gender Mainstreaming

EDSA will ensure that the adverse impact on women and children due to the Project are minimized or eliminated, including:

- Provision of opportunities for employment of females.
- Facilitation of education for children and determining the minimum age for labour participation and monitor labour hire.
- Incorporate into bidding documents requirements for the management of Sexual Exploitation and Abuse/ Sexual Harassment.
- Include code of conduct as part for contractors and workers conduct with clear language for the prohibition of SEA/SH and a punitive measure.
- Provide SEA/SH briefing during induction and briefing to workers prior to commencement of works.
- Update Project GRM for confidential reporting and referral to service providers

SECTION 10: CONCLUSION AND RECOMMENDATION

To improve electricity in the country, the GoSL has requested support from the Japanese Government through JICA to implement the extension of power distribution system along the Freetown Peninsula. There is no doubt this Project comes with a lot of social and economic benefits. However, the concern was how can the Project be implemented in an environmentally friendly manner. Therefore an ESHIA was commissioned.

This ESHIA study has been carried out according to statutory requirements for sustainable environment management in Sierra Leone. The JICA Guidelines (2010), World Bank ESS and industry best practices were also considered. The environmental studies identified possible Project impacts and suggested cost-effective measures to mitigate such impacts. The Project construction phase shall last for a short period and is expected to cause minimal effects of the loss of land, loss of vegetation, soil and water contamination, erosion, air pollution, noise, generation of solid waste, concerns related to the management of hazardous materials etc. Potential impacts of the proposed activity on air quality, noise, and water quality (and quantity) are defined as the adverse effects of changes in the baseline characteristics of these biophysical conditions on the health and welfare of humans and the ecosystems. Significant impacts constitute major changes resulting in acute or chronic health conditions and major impairment of critical ecosystems. The proponent commits to adopting appropriate mitigation measures and sustainable best management practices where such impacts occur.

No significant adverse environmental impact will warrant the Project's cancellation. Residents around the Project line route warmly favour the Project.

It is therefore recommended that:

- All appropriate environmental management measures detailed in this report and any other environment management commitments shall be implemented throughout the Project's entire life.
- However, residents' expectations from the proposed Project require continuous engagement with local stakeholders not to jeopardize the Project's successful implementation.

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ANNEX

Annex i: Labour Management Plan

The Project of Extension of Power Distribution System along the Freetown Peninsula perceives the need to secure the principal rights of workers since the labour force is an important resource. Thus, making sure there is a healthy worker-management rapport, treating workers equitably and providing them with safe working conditions are pivotal components to the sustenance of this project. This Labour Management Plan (LMP) is for the duration of the project construction phase. During the construction phase, project work specifications often determine labour requirements. It is the responsibility of the hired contractor to recruit personnel for the various classes of workers mentioned below. Although this LMP here is a generic one, it is expected that hired contractors develop specific labour management procedures for the different projects.

The objectives of the labour management procedure are:

- To advance the reasonable treatment, non-segregation, and equivalent opportunity of workers
- To strengthen, maintain, and improve the relationship between workers and management.
- To encourage adherence to national labour and employment regulations.
- To secure workers, including vulnerable categories of workers such as women.
- To improve worker safety and health through promoting safe and healthy working conditions.
- To avoid the use of child or forced labour.

This LMP follows the requirements outlined in ESS2 and it's captured in 1 to 6.

1. Types and Number of Project Workers

The project will involve the following classes of workers:

Direct Workers

Workers enrolled or engaged directly by the project to work exclusively with the project.

Contracted workers

Workers enrolled or engaged through third parties to perform work related to the project. The precise number of contractors who will be employed is not known as of now. When implementation begins this information will be known. Distribution line and substation construction include minor construction and rehabilitation and will engage civil works contractors and workers.

Community Workers

Are enrolled from the community or nearby communities where the particular activity takes place. These will be employed on a needs basis.

2. Potential Labour Risks

As per the nature of the project activities, a major labour risk is envisaged.

Labour risks associated with civil works contractor workers: local contractors who will be hired locally will be required to have a written contract consistent with the objective of ESS2, in particular about child and forced labour. The Child Rights Act of 2007 makes provision for the elimination of child labour, protection of children and young persons and prohibition of hazardous child labour.

Labour risks including labour influx and associated Sexual Exploitation and Abuse, Sexual Harassment, child labour and forced labour are viewed as low given the nature of project activities. The risk of forced labour is projected to be minimal because the project's civil works will be small in scale and shall for the most part require persons with special skills. In any case, the contractor will be needed in the agreement to make commitments against the utilization of forced labour, and task the staff responsible for contractor supervision to monitor and report the absence of forced labour.

Occupational Health and Safety (OHS) risks are viewed as low to moderate contingent on the type of project works to be implemented.

Notwithstanding, since the civil contractors' workers are probably unskilled and untrained neighbourhood populace, in any case, hazard remains that a few mishaps may happen that lead to wounds.

All contractors must develop and implement written labour management policies, including procedures to establish and maintain a safe working environment following the requirements of ESS2. As stated in this ESMP, all contractors shall ensure workers will use PPEs, receive basic safety training and other preventive actions as provided. A major risk is associated with climbing on electric poles, hence contractors' ESMP should cover this.

Employment Risks. Workers will be hired by the project, either directly as project staff or indirectly as part of contractors or service providers. There is a risk of unaccounted working hours and the lack of overtime compensation. Contractors should be encouraged to treat this as a major concern as it normally leads to an uprising among workers.

3. Working Conditions and Management of Worker Relationship

In line with the requirements of ESS2 and the laws of Sierra Leone, the project must create and implement human resources policies and procedures that are appropriate for its size and workforce and that outline how it will manage employees.

Documented information that is clear and understandable, regarding their terms and conditions of employment, their rights under the laws of Sierra Leone and any applicable collective agreements, including their rights to work hours, salaries, overtime, compensation, and benefits, shall be delivered by the project upon instant enrolment and at any major change that may occur.

The Extension of Power Distribution System along the Freetown Peninsula project will base the enrollment on the principle of equitable opportunity, fair treatment and non-discrimination involving recruiting and hiring, pay (including remuneration and benefits), working conditions, and employment terms, training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Harassment, intimidation, and/or exploitation will be prevented and addressed, particularly in the case of women. The current minimum wage in Sierra Leone is Le 600,000 (USD 52) monthly.

A grievance mechanism for workers to raise workplace concerns is provided for in *section 4*. During recruitment, the workers shall be informed of this mechanism and how to access it easily. The mechanism will involve the appropriate level of management and address concerns as soon as possible, utilizing a clear and open procedure that gives quick feedback to individuals affected without retaliation. Anonymous complaints should be filed and resolved using this approach. The mechanism will not preclude access to other judicial or administrative remedies available under the law or through current arbitration procedures, nor will it serve as a replacement for grievance mechanisms provided under collective bargaining agreements.

4. Protecting the Workforce Child Labour:

The project is not expected to utilize children in any way that is monetarily exploitative or is probably going to be risky or to meddle with the child's education, or to be unsafe to the child's wellbeing or physical, mental, spiritual, moral, or social development.

Under the Child Rights Act of 2007, the minimum age for admission of children into full-time employment is fifteen (15) as per section 125 of the Child Rights Act of 2007 and Section 52 of Chapter 212, Employers and Employed Act. The minimum age for a child's engagement in light work is thirteen (13) as per section 127 subsection one of the Child Right Act of 2007. However, the minimum age for engagement of persons in hazardous work is eighteen (18) as per section 128 subsection of the Child Right Act of 2007 and sections 47-56 of Chapter 212, Employers and Employed Act. The minimum age for employment or engagement set out in the World Bank's ESS 2 is fourteen (14). The project shall comply with the World Bank's minimum age and that of the laws of Sierra Leone.

This project shall likewise guarantee that children younger than eighteen (18) are not employed in hazardous work. All work of people younger than eighteen (18) shall depend

upon appropriate risk assessment and regular monitoring of health, working conditions, and work hours.

The GoSL has established institutional mechanisms for the enforcement of laws and regulations on child labour which includes the Ministry of Gender and Children's Affairs (MGCA), Ministry of Labour and Social Security (MLSS), Ministry of Justice's Director of Public Prosecution, Ministry of Internal Affairs' Police and Transnational and Organized Crime Unit. Their mandates include:

- to formulate, implement, and monitor compliance with child labour regulations through its Child Labour Unit.
- to enforce labour laws in the formal sector.
- to embark on nationwide sensitization and popularization of the labour migration policy, impacting child labour.
- to undertake criminal proceedings, including enforcement of criminal laws against forced child labour

If a minor under the minimum age for employment is discovered working on the project, steps must be made to promptly terminate the minor's employment or involvement in a responsible way, taking into account the minor's best interests.

This project shall not employ forced labour which consists of any work or service not voluntarily performed.

5. Occupational Health and Safety

This project shall minimize, prevent, and mitigate accidents, injury, and diseases arising from, or related with, or occur in the course of employment, as far as reasonable and practicable. The project shall address areas that include the:

- identification of potential workplace dangers, particularly those that could be life-threatening;
- the implementation of preventative and protective actions, such as the modification, substitution, or removal of harmful circumstances or substances;
- worker education;
- recording and reporting of workplace injuries, illnesses, and events; and
- plans for emergency prevention, preparedness, and response.

6. Workers Engaged by Third Parties

The project shall make reasonable efforts to ascertain that the third parties who engage contracted workers are reputable and legitimate organizations and have an appropriate labour management procedure. The project shall establish policies and procedures for

managing and monitoring the performance of such third-party employers with the requirements of ESS2.

Also, the project shall incorporate these requirements in contractual agreements with such a third party. A grievance process must be available to contract workers. In the event that the third party employing or engaging the workers is unable to provide a grievance process, the contracted workers will have access to the project's grievance mechanism.

The following records and reports from contractors' labour management could be examined:

- a sample of employment contracts or agreements between third parties and contracted workers, as well as records of grievances, received and resolved
- Safety inspection reports, including fatalities and events, as well as the implementation of corrective steps,
- records of non-compliance with national legislation, adherence to the applicable contractor workers code of conduct, and
- records of training given to contracted personnel to discuss occupational health and safety dangers and precautions.

7. Incident and Accident Reporting

In case of manifestation of an incident or accident-related or having an impact on this project which has, or likely to have, substantial adverse effect on the environment, the affected communities, the public or workers, the implementing agency shall:

- not later than five (5) calendar days after having been informed of such incident or accident, inform JICA by any electronic means of its nature or circumstance and any effect or impact resulting or likely to result therefrom as soon as reasonable and practicable.
- not later than twenty (20) days after such incident or accident, provide JICA with a summary report that includes a description of the incident or accident and the measures, if any, that EDSA is taking or plans to take to address it and to prevent any future similar event as reasonable and practicable and
- keep JICA informed of the ongoing implementation of the said measures and plans.

Regular reporting:

- Accidents and grievance logbooks are placed in all construction sites
- The monthly progress report from the supervision consultants will include information on accidents.
- All regular progress reports to JICA shall include information on accidents and incidents
- Any serious injury (requiring off-site medical care) or mortality occurrence must be reported to JICA with basic information within 24 hours, and a complete incident report containing the following must be filed within 10 working days:
 - a. root cause analysis and
 - b. corrective action plan on
 - i. immediate mitigation measures in case of continuing danger (e.g. fencing, signboard, guards)
 - ii. compensate to the affected family (in case of death) based on a clear rationale
 - iii. risk assessment and correct application of ESHS management procedures, and
 - iv. medium- and long-term mitigation measures, including enhancement of safety measures, audits, and additional training.

Annex iii: Plant Species Recorded Along the Proposed Distribution Corridor

SPECIES NAME	FAMILY	SITE 1	SITE 2	SITE 3	USES
<i>Cocos nucifera</i>	Arecaceae	X	X	X	F/U
<i>Cnestis ferruginea</i>	Commaraceae	X	X	X	M
<i>Cassia tora</i>	Caesalpinaceae	X		X	M/W
<i>Aspilia latifolia</i>	Compositae	X	X	X	
<i>Asystasia gangetica</i>	Acanthaceae	X	X	X	F
<i>Axonopus compressus</i>	Poaceae	X	X	X	M/U
<i>Ariocarpus communis</i>	Moraceae			X	F
<i>Milicia regia</i> (VU)	Moraceae	X	X	X	T
<i>Afzelia africana</i> (VU)	Caesalpinaceae		X	X	T
<i>Ficus capensis</i>	Moraceae	X	X	X	M
<i>Phyllocosmos africanus</i>	Ixonanthaceae	X	X	X	W
<i>Albizia adianthifolia</i>	Fabaceae		X	X	W
<i>Anacardium occidentale</i>	Anacardiaceae	X	X	X	F/M
<i>Macaranga barteri</i>	Euphorbiaceae		X		W/M
<i>Tamarindus indica</i>	Caesalpinaceae	X		X	F/M
<i>Dialium guineense</i>	Caesalpinaceae	X	X	X	F/M
<i>Tectona grandis</i>	Lamiaceae	X	X	X	T/M
<i>Gmelina arborea</i>	Lamiaceae	X	X	X	T
<i>Mangifera indica</i>	Anacardiaceae	X	X	X	F/M
<i>Ficus exasperata</i>	Moraceae	X	X		M
<i>Lophira lanceolata</i>	Ochnaceae		X		T
<i>Cassia sieberiana</i>	Caesalpinaceae	X	X		M
<i>Acacia auriculiformis</i>	Mimosaceae	X	X	X	W
<i>Acacia mangium</i>	Mimosaceae	X		X	W

Annex ii: Project Chance Find Procedure

Cultural resources are important sources of valuable historical and scientific information. They are integral parts of a people's cultural identity and practices. This Annex outlines actions that will be followed if previously unknown heritage resources, particularly archaeological resources, are encountered during project construction or operation. JICA/EDSA shall ensure that these procedures are included in projects' bidding and contract documents.

During excavation or construction, the Contractor may come across archaeological sites, historical sites, remnants, and artefacts, including graveyards and/or individual graves. In such a situation, the contractor shall:

- i. Stop work in the area of the fortuitous discovery;
- ii. Mark the location or area where the discovery was made;
- iii. Notify the EDSA environmental officer who in turn informs the National Museum (within 24 hours or less);
- iv. Make sure the spot is secure to avoid any harm or loss of removable items. In the case of artefacts that can be removed or delicate remains, 24 hours security will be provided until the National Museum assumes control;
- v. The responsible authorities shall take decisions on how to handle the finding. This could include layout adjustments (such as when an irreplaceable cultural or archaeological relic is discovered), conservation, preservation, restoration, and salvage;
- vi. If the cultural sites and/or relics are of high importance, and site preservation is advised by the relevant. JICA/EDSA would need to make design revisions to accommodate the request and conserve the site;
- vii. Construction works could resume only after permission is granted from the responsible authorities concerning the safeguard of the heritage.

SPECIES NAME	FAMILY	SITE 1	SITE 2	SITE 3	USES
<i>Imperata cylindrical</i>	Poaceae	X	X	X	U
<i>Croton hirtus</i>	Compositae	X	X	X	M
<i>Craterispermum laurinum</i>	Rubiaceae		X	X	M
<i>Dichrostachys glomerata</i>	Mimosaceae		X		M
<i>Dioscorea bulbifera</i>	Dioscoreaceae	X	X	X	F/M
<i>Homalium africanum</i>	Samydaeeae		X		W
<i>Parkia biglobosa</i>	Mimosaceae	X	X	X	F/M
<i>Bombax buanopozense</i>	Bombacaceae	X	X		M
<i>Funtumia Africana</i>	Apocynaceae		X	X	T/M
<i>Spondias mombin</i>	Anacardiaceae		X		F/M
<i>Parinari excels</i>	Chrysobalanaceae		X	X	F/M
<i>Neoboutida laevis</i>	Bignoniaceae	X	X	X	M
<i>Cassia occidentalis</i>	Caesalpinaceae		X	X	M
<i>Anthoetista nobilis</i>	Loganiaceae		X	X	U
<i>Salacia senegalensis</i>	Celastraceae		X	X	F/M
<i>Psychotria reptans</i>	Rubiaceae		X		
<i>Pteridium aquilinum</i>	Dennstaedtiaceae		X	X	
<i>Premna hispida</i>	Verbenaceae	X	X	X	M
<i>Psidium guajava</i>	Myrtaceae	X	X	X	F/M
<i>Smeathmannia laevigata</i>	Passifloraceae		X	X	M
<i>Sida stipulate</i>	Malvaceae	X	X	X	M
<i>Solanum torvum</i>	Solanaceae		X		F
<i>Sorindeia jugladifolia</i>	Anacardiaceae		X		F
<i>Pennisetum purpureum</i>	Poaceae	X	X	X	U
<i>Andropogon gabonensis</i>	Poaceae	X	X	X	U

SPECIES NAME	FAMILY	SITE 1	SITE 2	SITE 3	USES
<i>Chasmodium caudatum</i>	Poaceae		X	X	U
<i>Chasmodium afzelii</i>	Poaceae		X	X	U
<i>Rothboellia cochinchinensis</i>	Poaceae	X	X	X	U
<i>Sporobolus virginicus</i>	Poaceae	X		X	M
<i>Isachne globosa</i>	Poaceae		X	X	
<i>Hibiscus columnaris</i>	Malvaceae	X	X	X	F
<i>Passiflora foetida</i>	Passifloraceae			X	M
<i>Anthostema senegalense</i>	Euphorbiaceae		X		M
<i>Raphia vinifera</i>	Areaceae			X	U
<i>Eleusine indica</i>	Poaceae	X	X	X	M/U
<i>Centrosema pubescens</i>	Fabaceae	X	X	X	
<i>Calopogonium mucunoides</i>	Fabaceae	X	X	X	
<i>Diosotis rotundifolia</i>	Melastomataceae		X	X	
<i>Heterocentron subtriplicerium</i>	Melastomataceae		X	X	
<i>Zea mays</i>	Poaceae		X	X	F
<i>Xanthosoma sagittifolium</i>	Araceae		X	X	F
<i>Urena lobate</i>	Malvaceae			X	U
<i>Trema guineensis</i>	cannabaceae	X	X	X	
<i>Ipomoea triloba</i>	Convolvulaceae	X	X	X	
<i>Ipomoea batatas</i>	Convolvulaceae	X	X	X	F/M
<i>Tridax procumbens</i>	Asteraceae	X	X	X	
<i>Centotheca linearifolium</i>	Leguminosae	X		X	
<i>Cyathula prostrata</i>	Amaranthaceae		X		
<i>Cucumis sativus</i>	Cucurbitaceae		X		F
<i>Manihot esculenta</i>	Euphorbiaceae	X	X	X	F

SPECIES NAME	FAMILY	SITE 1	SITE 2	SITE 3	USES
<i>Bambusa vulgaris</i>	Poaceae		X	X	U
<i>Eleocharis guineensis</i>	Araceae	X	X	X	F/U/T
<i>Clerodendrum infortunatum</i>	Lamiaceae		X	X	M
<i>Panicum maximum</i>	Poaceae		X	X	U
<i>Anthoecleista procera</i>	Loganiaceae		X		
<i>Cajanus cajan</i>	Papilionaceae	X	X	X	F/M
<i>Harungana madascariensis</i>	Hypnaceae		X	X	M
<i>Capsicum annuum</i>	Solanaceae	X	X	X	F/M
<i>Mareya micrantha</i>	Euphorbiaceae	X	X	X	M
<i>Merremia umbellata</i>	Convolvulaceae		X	X	F
<i>Terminalia ivorensis</i> (VU)	Combretaceae	X	X	X	T
<i>Mimosa pudica</i>	Mimosaceae	X	X	X	M
<i>Costus afer</i>	Zingiberaceae		X	X	M
<i>Emilia coccinea</i>	Compositae	X	X	X	
<i>Bidens pilosa</i>	Compositae	X	X	X	
<i>Borreria verticillata</i>	Rubiaceae	X	X	X	M
<i>Sterculia tragacantha</i>	Sterculiaceae		X	X	M
<i>Phyllanthus discoides</i>	Euphorbiaceae	X	X	X	M
<i>Diospyros heudelotii</i>	Ebenaceae		X	X	F/M
<i>Diospyros thomasi</i>	Ebenaceae		X	X	M
<i>Anisophyllea laurina</i>	Anisophylleaceae	X	X	X	T/M
<i>Morinda geminata</i>	Rubiaceae	X	X	X	M
<i>Mussaenda efzelii</i>	Rubiaceae		X	X	
<i>Pennisetum macrourum</i>	Poaceae	X	X	X	U
<i>Plectranthus ciliatus</i>	Brassicaceae		X	X	

SPECIES NAME	FAMILY	SITE 1	SITE 2	SITE 3	USES
<i>Hibiscus sabdariffa</i>	Malvaceae		X	X	F/M
<i>Heritiera utilis</i> (VU)	Malvaceae		X		T
<i>Amphimas pterocarpoides</i>	Caesalpiniaceae		X		T
<i>Alchornea cordifolia</i>	Euphorbiaceae	X	X	X	M
<i>Musa sapientum</i>	Musaceae	X	X	X	F
<i>Persia Americana</i>	Lauraceae	X	X	X	F
<i>Physalis angulate</i>	Solanaceae	X	X	X	M
<i>Carica papaya</i>	Caricaceae	X	X	X	F/M
<i>Eucalyptus sp</i>	Myrtaceae	X		X	U
<i>Ocimum viride</i>	Labiatae			X	M
<i>Tetracera potatoria</i>	Dilleniaceae	X	X	X	M
<i>Chromolaena odorata</i>	Asteraceae	X	X	X	
<i>Carapa procera</i>	Meliaceae		X		M
<i>Daniellia thurifera</i>	Caesalpiniaceae		X	X	T
<i>Cucumis sativus</i>	Curcubitaceae	X	X		F
<i>Flacourtia indica</i>	Salicaceae		X		
<i>Cyperus polystachyos</i>	Cyperaceae	X		X	
<i>Kyllinga gracillima</i>	Cyperaceae	X	X	X	
<i>Cyperus rotundus</i>	Cyperaceae		X	X	
<i>Carpodinus dulcis</i>	Apocynaceae		X	X	M

USES OF THESE PLANTS: F – FOOD; M – MEDICINE; U – UTILITY; W – WOOD; T – TIMBER.
IUCN THREATENED STATUS: VU - VULNERABLE

Annex iv: Bird Species Recorded Along the Proposed Distribution Corridor

Scientific names	English names	Site 1	Site 2	Site3	Status	Biome
ACCIPRITRIDAE						
<i>Milvus migrans</i>	Yellow-billed Kite	x	x	x	AM	
<i>Gypohierax angolensis</i>	Palm-nut Vulture	x	x	x	R	
<i>Necropsyrtes monachus</i>	Hooded Vulture (CR)	x			R	
<i>Polyboroides typus</i>	African Harrier Hawk	x	x	x	R	
<i>Buteo auguralis</i>	Red-necked Buzzard	x	x	x	R	
<i>Kaupifalco monogrammicus</i>	Lizard Buzzard	x	x	x	R	
PHASIANIDAE						
<i>Francolinus bicaratus</i>	Double-spurred Francolin	x	x	x	R	
RALLIDAE						
<i>Sarothura pulchra</i>	White-spotted Flufftail	x	x	x	R	GC
COLUMBIDAE						
<i>Turtur tympanistris</i>	Tambourine Dove	x	x	x	R	
<i>Turtur afer</i>	Blue-spotted Wood Dove	x	x	x	R	
<i>Streptopelia semitorquata</i>	Red-eyed Dove	x	x	x	R	
<i>Streptopelia senegalensis</i>	Laughing Dove	x	x	x	R	
MUSOPHAGIDAE						
<i>Coryphaea cristata</i>	Great Blue Turaco	x	x	x	R	
<i>Crotophaga sulcirostris</i>	Western Grey Plantain-eater	x	x	x	R	
CUCULIDAE						
<i>Chrysococcyx cupreus</i>	African Emerald Cuckoo	x	x	x	R	
<i>Chrysococcyx klaas</i>	Klaas's Cuckoo	x	x	x	AM	
<i>Chrysococcyx caprius</i>	Didric Cuckoo	x	x	x	AM	
<i>Centropus senegalensis</i>	Senegal Coucal	x	x	x	R	
CAPRIMULGIDAE						
<i>Caprimulgus inornatus</i>	Plain Nightjar	x	x	x	R	
APODIDAE						
<i>Cypsiurus parvus</i>	African Palm Swift	x	x	x	R	
<i>Apus barbatus</i>	African Black Swift	x	x	x	AM	
<i>Apus affinis</i>	Little Swift	x	x	x	R	
ALCEDINIDAE						
<i>Halcyon malimbica</i>	Blue-breasted Kingfisher	x	x	x	R	
<i>Halcyon senegalensis</i>	Woodland Kingfisher	x	x	x	R	
MEROPIDAE						
<i>Merops persicus</i>	Blue-cheeked bee-eater	x	x	x	R	
<i>Merops albicollis</i>	White-throated Bee-eater	x	x	x	R	
CORACIIDAE						
<i>Eurystomus glaucurus</i>	Broad-billed Roller	x	x	x	R	
BUCEROTIDAE						
<i>Tockus fasciatus</i>	African Pied Hornbill	x	x	x	R	GC
<i>Ceratosymnna data</i>	Yellow-shouldered Hornbill (VU)	x	x		R	GC
CAPITONIDAE						
<i>Gymnobucco calurus</i>	Naked-faced Barbet	x	x	x	R	GC
<i>Pogonitulus scolopaceus</i>	Speckled Tinkerbird	x	x	x	R	GC
<i>Pogonitulus atroflavus</i>	Red-rumped Tinkerbird	x	x	x	R	GC

Scientific names	English names	Site 1	Site 2	Site3	Status	Biome
<i>Pogonitulus bilineatus</i>	Yellow-rumped Tinkerbird	x	x	x	R	
PICIDAE						
<i>Dendropicos fuscescens</i>	Cardinal Woodpecker	x	x	x	R	
<i>Picus caninus</i>	Grey Woodpecker	x	x	x	R	
HIRUNDINIDAE						
<i>Psalidoprocne nitens</i>	Square-tailed Saw-wing	x	x	x	R	GC
<i>Psalidoprocne obscura</i>	Fanti Saw-wing	x	x	x	R	GC
<i>Hirundo daurica</i>	Red-rumped Swallow	x	x	x	AM	
<i>Hirundo lucida</i>	Red-chested Swallow	x	x	x	R	
<i>Hirundo rustica</i>	Barn Swallow	x	x	x	PM	
PYCNONOTIDAE						
<i>Andropadus virens</i>	Little Greenbul	x	x	x	R	
<i>Andropadus gracilifrons</i>	Slender-billed Greenbul	x	x	x	R	
<i>Andropadus latirostris</i>	Yellow-whiskered Greenbul	x	x	x	R	
<i>Chlorocichla simplex</i>	Simple Leaflove	x	x	x	R	GC
<i>Thescelocichla leucopleura</i>	Swamp Palm Bulbul	x	x	x	R	GC
<i>Pyrhurus scandens</i>	Leaflove	x	x	x	R	GC
<i>Bleda canicapillus</i>	Grey-headed Bristlebill	x	x	x	R	GC
<i>Pycnonotus barbatus</i>	Common Bulbul	x	x	x	R	GC
<i>Nicator chloris</i>	Western Nicator	x	x	x	R	GC
TURDIDAE						
<i>Cossypha niveicapilla</i>	Snowny-crowned Robin chat	x	x	x	R	
<i>Stizorhina finschi</i>	Finsch's Flycatcher Thrush	x	x	x	R	GC
<i>Turdus pelios</i>	African Thrush	x	x	x	R	
SYLVIDAE						
<i>Melocichla mentalis</i>	African Moustached Warbler	x	x	x	R	
<i>Cisticola erythrops</i>	Red-faced Cisticola	x	x	x	R	
<i>Cisticola lateralis</i>	Whistling Cisticola	x	x	x	R	
<i>Cisticola brachypterus</i>	Short Wing Cisticola	x	x	x	R	
<i>Prinia subflava</i>	Tawny-flanked Prinia	x	x	x	R	
<i>Eremomela pusilla</i>	Senegal eremomela	x	x	x	R	
<i>Camuroptera brachyura</i>	Grey-backed Camaroptera	x	x	x	R	
<i>Camuroptera chloronota</i>	Olive-green Camaroptera	x	x	x	R	GC
<i>Macrosphenus concolor</i>	Grey Longbill	x	x	x	R	GC
<i>Sylvietta virens</i>	Green Crombec	x	x	x	R	GC
<i>Hylia prasina</i>	Green Hylia	x	x	x	R	GC
MUSCICAPIDAE						
<i>Melaenornis edoloides</i>	Northern Black Flycatcher	x	x	x	R	
MONARCHIDAE						
<i>Terpsiphone rufifrons</i>	Red-bid Paradise Flycatcher	x	x	x	R	GC
PLATYSTEIRIDAE						
<i>Bias musicus</i>	Black-and-white Flycatcher	x	x	x	R	
<i>Platysteira cyanea</i>	Common Wattle-eye	x	x	x	R	
NECTARINIIDAE						
<i>Cyanomitra verticalis</i>	Green-headed Sunbird	x	x	x	R	
<i>Cyanomitra cyanolaema</i>	Blue-throated Brown Sunbird	x	x	x	R	GC
<i>Cyanomitra olivacea</i>	Olive Sunbird	x	x	x	R	
<i>Hedydipna collaris</i>	Collared Sunbird	x	x	x	R	
<i>Cinnerys cupreus</i>	Copper Sunbird	x	x	x	R	

Tombo 22/01/22

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE PRETOWNS, PONDOKLUK

LOCATION: Pondokluk DATE: 17/12/2021

No.	Name	Occupation	Signature
1	Abdul Anwar	Youtuber	[Signature]
2	Shakila Lailah	Housewife	[Signature]
3	Kelby Saekah	Dayah/Teacher	[Signature]
4	Rita Mawati	Religious Leader	[Signature]
5	Alia Kerecia	Youtuber	[Signature]
6	Prithwina Anwar	Journalist	[Signature]
7	Hana Syifa Kurnia	Youtuber	[Signature]
8	Cherissa Karyono	Youtuber	[Signature]

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE PRETOWNS, PONDOKLUK

LOCATION: Pondokluk DATE: 17/12/2021

No.	Name	Occupation	Signature
9	Tri Riana Ramadani	Artist	[Signature]
10	Desty Kusuma	Chassis body	[Signature]
11	Maulidya P. Kusuman	Entrepreneur	[Signature]
12	Rendy R. Kusuman	Student	[Signature]
13	Shahmir N. Kusuman	Youtuber	[Signature]
14	Karnestika Mulya Sari	Student	[Signature]

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE PRETOWNS, PONDOKLUK

LOCATION: Pondokluk DATE: 17/12/2021

No.	Name	Occupation	Signature
10	Mia Ane Jati	Bank Employee	[Signature]
11	Devi Prati	Banking - SBC	[Signature]
12	Mr. Dharma Kurnia	Water Conduktor	[Signature]
13	Alfa Saiful	Trader	[Signature]
14	Fatma F. Fathul	Trader	[Signature]
15	Enghar Sesay	PISTIA 96.1	[Signature]
16	Chaf Anwar	Public Servant	[Signature]

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE PRETOWNS, PONDOKLUK

LOCATION: Pondokluk DATE: 17/12/2021

No.	Name	Occupation	Signature
17	Mohamad Fauzi	Head of Village	[Signature]
18	M. Fauzi	Head of Village	[Signature]
19	Yuni Yuni	Head of Village	[Signature]
20	Abdullah Saib	Head of Village	[Signature]
21	Zuhairi Saib	Head of Village	[Signature]
22	M. Fauzi	Head of Village	[Signature]
23	Mohamad Fauzi	Head of Village	[Signature]
24	M. Fauzi	Head of Village	[Signature]
25	M. Fauzi	Head of Village	[Signature]

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE PRETOWNS, PONDOKLUK

LOCATION: Pondokluk DATE: 17/12/2021

No.	Name	Occupation	Signature
26	M. Fauzi	Head of Village	[Signature]
27	M. Fauzi	Head of Village	[Signature]
28	M. Fauzi	Head of Village	[Signature]
29	M. Fauzi	Head of Village	[Signature]
30	M. Fauzi	Head of Village	[Signature]
31	M. Fauzi	Head of Village	[Signature]
32	M. Fauzi	Head of Village	[Signature]
33	M. Fauzi	Head of Village	[Signature]
34	M. Fauzi	Head of Village	[Signature]
35	M. Fauzi	Head of Village	[Signature]

MOHAPEWA
Dealer in Spectra Precision

Project: The Extension of Power Distribution System using the Frequency Transformer
Location: Bales, Jember
Date: 15/01/2023

No.	Name	Community/Institution	Signature	Signature
1	Alex Esa B. B. B.	Hand. man	[Signature]	[Signature]
2	Pet. James	Plasman	[Signature]	[Signature]
3	M. B.	Community	[Signature]	[Signature]
4	M. B.	Community	[Signature]	[Signature]
5	M. B.	Community	[Signature]	[Signature]

MOHAPEWA
Dealer in Spectra Precision

Project: The Extension of Power Distribution System using the Frequency Transformer
Location: Bales, Jember
Date: 15/01/2023

No.	Name	Community/Institution	Signature	Signature
1	Junisa Felis	Sejahtera	[Signature]	[Signature]
2	Abi B. K.	Kampung	[Signature]	[Signature]
3	Moses H. T.	Yanti	[Signature]	[Signature]
4	M. H.	Kampung	[Signature]	[Signature]
5	P. M.	Kampung	[Signature]	[Signature]
6	M. S.	Kampung	[Signature]	[Signature]
7	M. S.	Kampung	[Signature]	[Signature]
8	M. S.	Kampung	[Signature]	[Signature]
9	M. S.	Kampung	[Signature]	[Signature]

MOHAPEWA
Dealer in Spectra Precision

Project: The Extension of Power Distribution System using the Frequency Transformer
Location: Bales, Jember
Date: 15/01/2023

No.	Name	Community/Institution	Signature	Signature
1	Junisa Felis	Sejahtera	[Signature]	[Signature]
2	Abi B. K.	Kampung	[Signature]	[Signature]
3	Moses H. T.	Yanti	[Signature]	[Signature]
4	M. H.	Kampung	[Signature]	[Signature]
5	P. M.	Kampung	[Signature]	[Signature]
6	M. S.	Kampung	[Signature]	[Signature]
7	M. S.	Kampung	[Signature]	[Signature]
8	M. S.	Kampung	[Signature]	[Signature]
9	M. S.	Kampung	[Signature]	[Signature]

MOHAPEWA
Dealer in Spectra Precision

Project: The Extension of Power Distribution System using the Frequency Transformer
Location: Bales, Jember
Date: 15/01/2023

No.	Name	Community/Institution	Signature	Signature
10	M. S.	Kampung	[Signature]	[Signature]
11	M. S.	Kampung	[Signature]	[Signature]
12	M. S.	Kampung	[Signature]	[Signature]

Request for Extension of Power Distribution System along the Extension of Power Distribution System ALONG THE TOWN OF MOHAPEWA

Project: York Village Date: 15/10/2023

No.	Name	Community/Institution	Designation/Position	Signature
1	EUZALIETH BISOKE	YORK	Chair LADY	Ben
2	Zinnah Kanyo	York K	D.V. chair	A
3	Francis Maki	York Village		
4	Raymond Pratt	York Village	Chair	
5	Julius Pratt	York Village	Headman	
6	Ismael Embury	York Village		
7	EDWARD SIDPMY	York	Chair	
	National Union	York	Secretary	

Request for Extension of Power Distribution System along the Extension of Power Distribution System ALONG THE TOWN OF MOHAPEWA

Project: York Village Date: 21/8/23

No.	Name	Designation	Signature
	Ally Alio Balleh	Angela, Angella's	
	Samuel Fenyigen	Angela, Angella's	
	MOHAMED BRANSURIA	Angela, Angella's	
	PHILIP MONGUCH	Angela, Angella's	
	Abdulle	Angela, Angella's	
	Alison of Conch	Angela, Angella's	
	Taradito Conch	Angela, Angella's	
	Mohamed Kallay	Angela, Angella's	

MOHAPEWA Dealer in Spectra Precision

No.	Name	Designation	Signature
1	Refanand & eyes	Trader Spectra Precision	
2	Abubakar Bangura	Trader Spectra Precision	
3	Kadiata Odeh	Trader Spectra Precision	
4	Mr. Mohamed Conté	Trader Spectra Precision	
	Mali Sesay	Trader Spectra Precision	
	Janet Kassiay	Trader Spectra Precision	
	Muhamadu Kama	Trader Spectra Precision	
	Devides D. D. D.	Trader Spectra Precision	
	Hussein Bangura	Trader Spectra Precision	
	Samuel Jones	Trader Spectra Precision	
	Amadou Sesay	Trader Spectra Precision	

MOHAPEWA Dealer in Spectra Precision

No.	Name	Designation	Signature
	Soni Fofana	Trader Spectra Precision	
	Tou Jatta	Trader Spectra Precision	
	Muhamadu Sesay	Trader Spectra Precision	
	Lehal Jones	Trader Spectra Precision	
	Karim Sesay	Trader Spectra Precision	
	Hama Sesay	Trader Spectra Precision	
	Demel Sesay	Trader Spectra Precision	
	Muhamadu Sesay	Trader Spectra Precision	
	Muhamadu Sesay	Trader Spectra Precision	
	Amata Sesay	Trader Spectra Precision	
	Amata Sesay	Trader Spectra Precision	
	Amata Sesay	Trader Spectra Precision	

MOHAPEWA
Dealer in Spectra Precision

PROPERTY CONSULTATION ENVIRONMENTAL AND SOCIAL CONSULTATION REPORTS PREPARED BY
SERVITY FOR THE EXTENSION OF WATER DISTRIBUTION SYSTEM ALONG THE ERETRON RIVER VALLEY

DATE: 3-2-2013

No. Name Designation Signature

1. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

2. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

3. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

4. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

5. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

MOHAPEWA
Dealer in Spectra Precision

PROPERTY CONSULTATION ENVIRONMENTAL AND SOCIAL CONSULTATION REPORTS PREPARED BY
SERVITY FOR THE EXTENSION OF WATER DISTRIBUTION SYSTEM ALONG THE ERETRON RIVER VALLEY

DATE: 3-2-2013

No. Name Designation Signature

1. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

2. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

3. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

4. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

5. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

MOHAPEWA
Dealer in Spectra Precision

PROPERTY CONSULTATION ENVIRONMENTAL AND SOCIAL CONSULTATION REPORTS PREPARED BY
SERVITY FOR THE EXTENSION OF WATER DISTRIBUTION SYSTEM ALONG THE ERETRON RIVER VALLEY

DATE: 3-2-2013

No. Name Designation Signature

1. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

2. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

3. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

4. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

5. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

MOHAPEWA
Dealer in Spectra Precision

PROPERTY CONSULTATION ENVIRONMENTAL AND SOCIAL CONSULTATION REPORTS PREPARED BY
SERVITY FOR THE EXTENSION OF WATER DISTRIBUTION SYSTEM ALONG THE ERETRON RIVER VALLEY

DATE: 3-2-2013

No. Name Designation Signature

1. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

2. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

3. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

4. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

5. *[Redacted]* *[Redacted]* *[Redacted]* *[Signature]*

MOHAPEWA
 Provider in Specialty Population

PROJECT FOR CONSULTATION, PARTICIPATION AND SOCIAL ORGANIZATION (PCSO) FOR THE PREPARATION OF THE NATIONAL WATER SUPPLY AND SANITATION POLICY FOR THE YEAR 2011-2012

LOCATION: 01-03-001

DATE: 13-8-2011

No.	Name	Designation	Signature
1	Abelino	Chairman	[Redacted]
2	Chabane	Member	[Redacted]
3	John	Member	[Redacted]
4	John	Member	[Redacted]
5	John	Member	[Redacted]

14. Environmental and Social Consideration Survey Report (ESMP)

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ESMP

For the Project of Extension of Power Distribution System Along the Freetown Peninsula in the Republic of Sierra Leone



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SECTION 1: INTRODUCTION

Through the Electricity Distribution and Supply Authority (EDSA), the Government of Sierra Leone (GoSL) is applying for a loan from Japan International Cooperation Agency (JICA) to finance the Project of Extension of Power Distribution System Along the Freetown Peninsula. The proposed Project supports the government sector strategy and builds on the just concluded and ongoing World Bank's energy projects like Energy Access Project (EAP) and the Energy Sector Utility Reform Project (ESURP), all aimed at achieving a sustainable power sector. The Project's main is to expand and stabilise the power supply in the southwest part of the Freetown Peninsula from Goderich to Kerry Town via Sussex, Tokeh, York, Kent, Tombo etc. communities by constructing two new primary substations, secondary substations and distribution network to continue to contribute to the reduction of poverty, the stability of society and the establishment of peace. These areas are rapidly developing and have great touristic potential and revenue generation. The Project, when completed, will enhance the capacity of the distribution network to take and distribute additional electricity to underserved communities and businesses in the Peninsula area of Freetown. This will also improve the financial and technical performance of EDSA.

As part of the Project preparation, EDSA is required to prepare Environmental, Social and Health Impact Assessment (ESHIA) in accordance with the EPA Act (2008) as amended in 2010 of Sierra Leone, JICA Guidelines for Environmental and Social Considerations of 2010 (JICA Guidelines) and the World Bank Group Environmental and Social Standards (ESS). In Part IV, Section 23 subsection 1, of the EPA Act (2008), projects in First Schedule (with major impacts) require to undertake ESIA and get a permit to commence works and operations. The Project was screened and categorised as a 'Category B' project therefore requires an ESHIA. This standalone Environmental and Social Management Plan (ESMP) is complementing the main ESHIA report.

1.1 Project Description

The proposed Project is aligned with the Ministry of Energy's Strategic Plan (2018-2030) and will cover some important areas in the Western Area Rural District from Goderich to Kerry Town (*Figure 1*). These areas are seeing rapid expansion in settlements and population but are struggling to get access to electricity with some areas not even covered by the Freetown grid. The Project will construct two primary substations in York and Tombo and several secondary substations along the distribution line route. The existing 33kV line terminates at Sussex and a new distribution line will be constructed from Sussex.



Figure 1: Map of Project Area

Preliminary site visits along the route show an overhead fiber line route for SIERRATEL Line (*see Figure 2*), and the line extends moderate environmental and social issues. Fortunately, this is the same path designated for the proposed Project. It is important that the Project follows this proposed route which is on the left side of the Sierra Leone Roads Authority (SLRA) RoW from Goderich to Tombo as that would considerably minimise the Project's environmental and social impacts.



Figure 2: SIERRATEL Line under Construction

Table 1 presents the proposed Project components and details of the construction and procurement works.

Table 1: Project Components

No	Components	Quantities
	Procurement and Installation Work	
1	Construction of 33kV line (Goderich SS to Tombo SS) (a) 33kV overhead line	Approx. 46km
2	Construction of 11kV line (Sussex to Medical Hospital at Kerry Town) (a) 11kV overhead line	Approx. 52km
3	Construction of 33/11kV Primary substation (a) 1x 15MVA 33/11kV Tombo substation (b) 1x 15MVA 33/11kV York substation	1 lot 1 lot
4	Construction of 11/0.4kV Secondary substation (a) 100kVA Pole-mount type (b) 250kVA Pole-mount type (c) 2x250kVA Pole-mount type (d) 315kVA Ground-mount type (e) 630kVA Ground-mount type	28 locations 6 lot 11 lot 5 lot 4 lot 2 lot
	Procurement Work	
5	Low voltage facilities (poles, conductors, cables, insulators, power meters)	1 lot
6	Maintenance Tools	1 lot
7	Spare Parts and Consumables	1 lot
8	Rock-breaker1	1 set
	Construction Work	
9	Construction of buildings for substation	2 buildings
10	Civil works	1 lot

NOTE:

Macdonald and Samuel town will be supplied power from Waterloo substation
Note that contents and quantities are subject to change.

1.2 Objectives of the ESMP

The basic objective of the ESMP is to manage the adverse impacts of proposed Project interventions in a way that minimises the negative consequences on the environment and people in the Project area. The ESMP's specific objectives are to:

- Provide a practical framework for creating environmental management standards that are best in class. Reduce the possibility for environmental harm in each activity. Assist managers, supervisors, and EPC (Engineering, Procurement and Construction) contractors in complying with applicable legislation.
- Provide a mechanism to reduce the potential impacts of the construction and operation of the Project.

SECTION 2: POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

The policy, legal and institutional frameworks governing development projects usually provide guidelines to ensure the protection of the environment, livelihood, wellbeing of workers and residents, and sustainable development. The policy and legal provisions are found in various national policies and legal documents. International policies on environmental management include the JICA Guidelines for Environmental and Social Considerations (JICA Guidelines), World Bank guidelines on environmental health and safety, and the World Bank Environmental and Social Standards (ESSs), which form part of the World Bank's 2016 Environmental and Social Framework (ESF). These form important guidelines for the Project of Extension of Power Distribution System along the Freetown Peninsula.

The following national legislations are related to the ESMP of the Project:

- The Constitution of Sierra Leone 1991;
- The Environment Protection Agency Act (2008) as amended in 2010
- The National Environmental Policy (Revised Edition – October 1994);
- The National Electricity Act of 2011
- The Forestry Act of 1988
- The Forestry Regulations of 1989
- The Wildlife Conservation Act of 1972
- The Wildlife Conservation Amendment of 1990
- The National Protected Area Authority and Conservation Trust Fund Act of 2012
- The Sierra Leone Roads Authority (Amendment) Act of 2010
- The Factories Act of 1974
- The Local Government Act of 2004
- The Sierra Leone Road Safety Authority Act of 1996 (amended 2016)

These Acts have been discussed in the ESHIA (main report).

SECTION 3: ENVIRONMENTAL, SOCIAL MANAGEMENT AND MONITORING

The Environmental and Social Management Plan (ESMP) specifies the principles, methodologies, procedures, and methods to regulate and minimise the environmental and social impacts of all construction and operational activities involved with the Project implementation.

The ESMP is a set of mitigation, management and monitoring measures to be taken during the Project's implementation to avoid, reduce, mitigate, or eliminate any adverse social and environmental impacts analysed in the ESHIA Report. The ESMP has distinguished between mitigation measures that should be implemented during the construction and operation of the Project.

ESMP defines procedures to ensure that the management of environmental and social issues during the different project phases are undertaken in accordance with national legislation and best practice procedures. The ESMP presented in this section reflects the implementation procedures and mechanisms for the mitigation measures and monitoring activities of the expected impacts of the Project. It assigns certain tasks for different stakeholders according to their roles and responsibilities in the Project.

The ESMP's success will be determined by a range of different elements. To ensure a management plan that incorporates and successfully integrates with other documents, the following elements must be considered and acted upon:

- There should be an Environmental and Social Management unit fully equipped with complete competencies to perform the tasks.
- The development and management of registers for the proper documentation and tracking of environmental and social training, environmental and social incidents, and environmental and social related complaints.

3.1 Institutional Arrangements

EDSA bears the overall responsibility for the environmental and social performance of the Project and the effective implementation of the ESMP. The Environmental and Social Management Unit (ESMU) which shall be headed by an Environmental and Social Officer shall manage and supervise the contractors. The ESMU will compile quarterly regular progress reports on ESMP compliance to be sent to the Director-

General at EDSA and JICA, throughout the Project construction period. Contractors shall be also supervised in order to ensure design compliance and quality assurance of the construction activities.

The contractors shall have to provide environmental management reports to EDSA, therefore, they should have EHS officers who will be tasked to first develop the various construction ESMP in accordance with this ESMP and then be responsible for its implementation during construction activities. The Contractor shall promptly correct any unsafe conditions brought to his attention. Within twenty-four (24) hours of the event of an accident, the Contractor must furnish EDSA with a written report including all important aspects of the accident. This report shall include recommended actions to prevent future occurrences.

3.2 Environment Related Training

All employees and subcontractors involved with the proposed Project shall receive environmental instruction about the ESMP. Each person shall be made aware of and have an understanding of their obligations and duties detailed in this ESMP.

3.3 ESMP and Monitoring Plan during Construction Phase

Table 2 presents the environmental management responsibilities of the Contractor and how EDSA monitors the Contractor during the construction stage.

Table 2: Construction Phase ESMP and Monitoring

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Waste Management Plan General Waste	Pollution of the soil and water as a result of poor waste management and surplus materials on construction sites.	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Develop a site-specific waste management plan for various specific waste streams (e.g., reusable waste, flammable waste, construction debris, food waste, etc) before commencing construction and submit it to EDSA for approval. A designated dumpsite should be identified in agreement with the Western Area Rural District Council before commencing construction works. The only approved dumpsite presently is at Waterloo. Arrange for the disposal of all building wastes at specified disposal sites. Use the 3R (Reduce, Recycle, and Reuse) technique to reduce waste creation. Sort all wastes and reuse or recycle as much as possible. To prevent waste from spilling onto the road, vehicles conveying solid waste must be covered with tarps or nets. 	<p>The Environmental & Social Safeguards Officer at EDSA shall:</p> <ul style="list-style-type: none"> Ensure the collection, transportation and disposal of wastes are according to the measures. Regarding the hazardous waste generated, the management, temporary storage, transportation, and disposal to the designated landfill should be

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Hazardous Waste	Improper hazardous waste management procedures pose health risks and have negative environmental consequences.	<ul style="list-style-type: none"> As part of the environmental induction process, train all employees on waste management techniques and procedures. Place waste bins at each jobsite. Request that suppliers use as little packaging as possible. Emphasise the importance of excellent house-keeping. Keep all construction sites clean, neat, and safe, and supply and maintain appropriate temporary storage facilities for all wastes prior to transportation and eventual disposal. 	following best practices.
		<p>The Contractor shall:</p> <ul style="list-style-type: none"> Store, transport, and handle all chemicals in a way that does not pollute the environment. Properly store all hazardous wastes away from watercourses in banded areas. Make hazardous Material Safety Data Sheets (MSDS) available on-site during construction. Collect hydrocarbon wastes, such as lubricant oils, for safe transfer to approved sites for reuse, recycling, treatment, or disposal. Use concrete or other impermeable flooring to prevent spills from seeping through. 	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Fuels and Hazardous goods	<p>Fuels and hazardous goods Management Plan</p> <p>Construction materials have the potential to be a source of pollution/contamination. On-site storage and handling of fuels, lubricants, chemicals, and hazardous goods/materials, as well as potential leaks, may endanger the environment and construction workers' health.</p>	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Prepare spill control procedures and submit them to the EDSA for approval. Train the relevant personnel in the handling of fuels and spill control procedures. Store dangerous goods in banded areas on top of a sealed plastic sheet away from watercourses. Refuelling shall occur only within banded areas. Follow the instructions on the MSDS for storing and using fuels. Make MSDS for chemicals and dangerous goods available on-site. Transport hazardous garbage to an authorised disposal site. Make available absorbent and containment materials (for example, absorbent matting) in areas where hazardous materials are used and stored, and ensure that staff is properly trained. Provide construction workers with protective apparel, such as safety boots, helmets, masks, 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> Inspect the construction site regularly to ensure management plans are followed

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
		<ul style="list-style-type: none"> gloves, and goggles, that are appropriate for the materials being used. Check that all storage containers, barrels, and tanks are in good working order and that the expiration dates are clearly marked. Any damaged, broken, or corroded container, drum, or tank will eventually leak. Check for leaks regularly to identify potential problems before they occur. Store and use fuels following MSDSs. Store all liquid fuels in fully bunded storage containers with appropriate volumes, a roof, a collection point, and an appropriate filling/decanting point. Store hazardous materials above flood level considered for construction purposes Store containers and barrels in clearly demarcated areas where they will not be knocked over by cars or heavy machinery for a period of time. In the case of a spill, the area should ideally slope or drain to a safe gathering point. Avoid polluting the environment by taking all precautions when handling and storing fuels and lubricants. 	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Water Resources Hazardous material and waste	<p>Management Plan</p> <p>Accidental spillage and water contamination caused by the storage, processing, and disposal of hazardous products and normal construction debris</p>	<ul style="list-style-type: none"> Substitute more ecologically friendly materials for ones that have a higher potential for contamination. <p>The Contractor shall:</p> <ul style="list-style-type: none"> Follow the management guidelines proposed above. Reduce the amount of silt, oil, and grease produced, as well as extra nutrients, organic matter, litter, debris, and any other type of waste (particularly petroleum and chemical wastes). These compounds should not be allowed to enter water bodies. <p>The Contractor shall:</p> <ul style="list-style-type: none"> Construct temporary drainage works (channels and bunds) in places where sediment and erosion control are necessary, as well as around construction material storage areas. Where appropriate, install temporary sediment basins to absorb sediment-laden flow from the site. Divert runoff away from the construction site's undisturbed areas. 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> Ensure that the water resources management strategy is implemented correctly.
Discharge from construction sites	<p>Construction activities, sewerages from construction sites, and work camps may affect the surface water quality. Ground cover and topography will be altered as a result of the development, altering the area's surface water drainage patterns. These changes in hydrological</p>		

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
	regime lead to an increased rate of runoff, increase in sediment and contaminant loading, increased flooding, and effect habitat of fish and other aquatic biology.	<ul style="list-style-type: none"> Storing goods away from drainage lines is a good idea. To prevent all solid and liquid wastes from entering waterways, collect all solid wastes, chemicals, oils, and wastewaters from brick, bitumen spray waste, concrete, and asphalt cutting and transport to an approved waste disposal site or recycling depot. Clean ready-mix concrete agitators and concrete handling equipment in off-site washing facilities or in designated bunded areas on-site. Ensure that construction truck tires are washed in the washing bay (located near the entrance). 	
Erosion and siltation of the soil	The sediment and pollutant loading of surface water bodies will be exacerbated by soil erosion and dust from material stockpiles.	<p>The Contractor shall:</p> <ul style="list-style-type: none"> As soon as possible after earthwork, stabilise the cleared areas not used for construction activities with vegetation or adequate surface water treatments to prevent erosion. Water the loose material stockpiles, access roads, and bare soils on an as-required basis to reduce dust. Increase the frequency of watering during times of high risk (e.g. high winds). 	

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Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Construction activities in water bodies	Construction works in water bodies will increase sediment and contaminant loading, and affect the habitat of fish and other aquatic biology.	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Pump water to a sediment basin before releasing it off-site to de-water sites; do not pump directly off-site. Monitor the water quality of runoff from the site or regions impacted by dredges/excavation plumes, and make any necessary changes to work methods. Use silt screens or other barriers to protect water bodies from sediment loads. Reduce the amount of silt, oil, and grease produced, as well as extra nutrients, organic matter, litter, debris, and any other type of waste (particularly petroleum and chemical wastes). These compounds should not be allowed to enter rivers. Do not dump cement and water used in the curing of cement concrete into watercourses or drainage inlets. 	
Soil Quality Management Plan	Hazardous and toxic substances will contaminate the soils if they are spilled.	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Strictly manage the wastes management plans proposed and storage of hazardous materials. 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> Ensure that the Soil Quality Management
Hazardous and poisonous chemicals that leak into watercourses and drainage inlets.			

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Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Construction material stockpiles		<ul style="list-style-type: none"> For all gasoline storage places, construct appropriate spill containment facilities. Create and maintain a hazardous material registry that lists the locations and quantities of hazardous compounds, as well as how they are stored and disposed of. In order to reduce the danger of leakage, train workers to apply safe work practices. If contamination has been reported, determine the source of the contamination and contain the contaminated area. Isolating the source or implementing controls surrounding the impacted site may be used to limit the damage. Remediate the contaminated land with the best possible technology. 	measures are followed
Erosion and siltation of soil	Soils may be contaminated by erosion from construction material stockpiles.	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Use silt fences, straw bales, or bunds to protect the toes of all stockpiles where erosion is likely. 	
Clearing of construction sites	Cleared areas and slopes are susceptible to erosion of topsoils, which affects the growth	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Prepare site-specific erosion and sediment control measures and submit them to EDSA for approval. 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> Make sure that the Erosion and

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Construction activities and material stockpiles	<p>of vegetation and causes ecological imbalance.</p> <p>The impacts of soil erosion are:</p> <p>(i) Increased runoff and sedimentation causing a greater flood hazard to the downstream, and</p> <p>(ii) destruction of the aquatic environment by erosion and/or deposition of sediment damaging the spawning grounds of fish</p>	<ul style="list-style-type: none"> As soon as possible, reinstate and protect cleared areas. Cover an unused area of disturbed or exposed surfaces immediately with mulch/grass turf/tree plantations <p>The Contractor shall:</p> <ul style="list-style-type: none"> Keep stockpiles away from drainage lines. Use silt fences, straw bales, or bunds to protect the toes of all stockpiles where erosion is likely to occur. Clear debris from drainage paths and sediment control structures. Cover the loose construction material sediments and water them if necessary. Divert natural runoff around construction areas before any site disturbance. Install protective measures on-site before construction, for example, sediment traps. Monitor the performance of drainage structures and erosion controls during rainstorms and make changes as needed. 	Sediment Control Plan are followed
Erosion and siltation of soil	Surface water body sediment and contaminant loading	<p>The Contractor shall:</p> <ul style="list-style-type: none"> To minimise erosion, stabilise cleared areas not used for construction activities with 	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Land clearing and earthworks	will be increased due to soil erosion and dust from material stockpiles.	<p>vegetation or appropriate surface water treatments as soon as possible after earthwork.</p> <ul style="list-style-type: none"> As needed, water the material stockpiles, access roads, and bare soils to reduce dust. Increase the frequency of watering during high-risk periods (e.g. high winds). 	
Top Soil Management Plan	Earthworks will impact the fertile topsoils that are enriched with nutrients required for plant growth or agricultural development.	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Remove any unwanted materials from the topsoil, such as grass, tree roots, and other similar materials. The stockpiles will be built on a 2:1 slope to reduce surface runoff and increase percolation through the mass of stored soil. Protect topsoil stockpiles from erosion by locating them away from drainage lines. To prevent erosion and loss of topsoil, build diversion channels and silt fences around topsoil stockpiles. Spread the topsoil to maintain the soil's physicochemical and biological activity. The topsoil that has been stored will be used to cover all disturbed areas and along the proposed agricultural lands. 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> Ensure that the Top Soil Management Plan is followed

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Air Quality Management	Vehicle exhaust emissions and fuel combustion can have a negative impact on air quality.	<p>The ground surface was prepared prior to the re-spreading of topsoil.</p> <p>The Contractor shall:</p> <ul style="list-style-type: none"> Prepare air quality management plan (under the Pollution Prevention Plan) and submit the plan to EDSA for approval. Install appropriate exhaust systems and emission control devices in vehicles. Keep these devices in good working order. Use the vehicles in the most fuel-efficient manner possible. Cover vehicles that transport dusty materials outside of the construction site. Manage the flow of construction traffic. Clean construction materials before loading and transporting them. Maintainance all vehicles on a regular basis to reduce emissions. Limit vehicle idling time to no more than 2 minutes. 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> Ensure that the Contractor is applying mitigation measures on-site Daily visual monitoring of the increased dust and exhaust emission Immediate action if there is a complaint from the surrounding communities.
Construction machines/equipment	Emissions from machinery and fuel combustion can have a	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Install appropriate exhaust systems and emission control devices on machinery. To maximise combustion efficiency and 	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Construction activities	negative impact on air quality.	<p>minimise contaminant emissions, keep these devices in good working order and in accordance with the specifications specified by their manufacturers.</p> <ul style="list-style-type: none"> Equipment suppliers and contractors/subcontractors will require proof of a maintenance register. Pay special attention to reducing emissions from generators. Machinery causing excess pollution (e.g. visible smoke) will be banned from construction sites. Service all equipment regularly to minimise emissions. Provide filtering systems, duct collectors, humidification, or other techniques (as applicable) to the concrete batching and mixing plant to control particle emissions at all stages of production, including unloading, collection, aggregate handling, and cement dumping, circulation of trucks and machinery inside the installations. <p>The Contractor shall:</p> <ul style="list-style-type: none"> Stockpiles of materials, access roads, and bare soils need to be watered as needed to reduce the risk of impacts from dust. Increase the frequency of watering during high-risk 	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
	environment and can be a health hazard, and also can affect the local crops;	<p>periods (e.g. high winds). Stored materials, such as gravel and sand, must be covered and confined to prevent wind drift.</p> <ul style="list-style-type: none"> Reduce the extent and duration of bare surface exposure. Cement is stored in silos, and the emissions from the silos are reduced by equipping them with filters. Establish adequate locations for construction material storage, mixing, and loading in such a way that dust dispersion is minimised as a result of such operations. Crushing of rocky and aggregate materials must be done wet or with particle emission control systems. Not permit the burning of solid waste. 	
Noise and Vibration Management Plan	The quality of the noise will be harmed as a result of vehicular traffic.	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Prepare a noise and vibration management plan (under the Pollution Prevention Plan) and submit the plan to EDSA for approval. Maintain all vehicles to keep them in good working order in accordance with the manufacturer's maintenance procedures. 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> Reviewing Contractor's policy for EHS and ensure that all the national
Vehicle traffic on construction sites			

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Construction machines/equipment	Noise and vibration from machines can have an impact on people, livestock, and the natural environment.	<ul style="list-style-type: none"> Ensure that all drivers follow traffic laws regarding maximum speed limits, driving hours, and so on. Organise truck loading and unloading, as well as handling operations to reduce construction noise on the site. <p>The Contractor shall:</p> <ul style="list-style-type: none"> Appropriately place all noise-generating activities to avoid noise pollution to residents. Use the quietest available equipment. Maintain all machinery in good working order by following the manufacturer's maintenance procedures. Equipment suppliers and contractors must show proof of their equipment's maintenance logo. To reduce noise levels, install acoustic enclosures around generators. Install high-efficiency mufflers on appropriate construction machinery. Avoid the use of unnecessary alarms, horns, and sirens. 	<p>and international requirements are fulfilled;</p> <ul style="list-style-type: none"> Random inspection on the Contractor's on construction site; Review the Contractor's Project progress, and the complaint from the surrounding communities, if any, due to the noise and vibration disturbance.
Construction Work	Noise and vibration from construction activities can have an	The Contractor shall:	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
	impact on people, property, fauna, livestock, and the natural environment.	<ul style="list-style-type: none"> Notify adjacent residents in advance of any typical noise events that occur outside of daylight hours. Educate construction equipment operators on potential noise issues and techniques for reducing noise emissions. Use the best available work practices on-site to keep occupational noise levels to a minimum. Where appropriate, install temporary noise control barriers. Plan on-site activities and deliveries to and from the site to reduce its impact. Results of noise and vibration should be regularly monitored and analysed. And make adjustments to construction practices where necessary. When working at night near residential areas, avoid the noisiest activities as much as possible. 	
Flora Protection Plan Clearing Vegetation	Local flora is important for providing bird habitat, providing fruits and/or timber/firewood, preventing soil erosion,	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Minimise the amount of disturbance to the surrounding vegetation. Use the appropriate type and size of machine to avoid disturbing nearby vegetation. 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> Ensure Flora Protection Plan is closely followed

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
	and overall keeping the environment very friendly to human living. As a result, flora damage has a wide range of negative environmental consequences.	<ul style="list-style-type: none"> Wherever possible, prune trees selectively and carefully to reduce the need for tree removal. Only clear vegetation that is required to be cleared in accordance with engineering plans and designs. These measures apply to both the construction areas as well as to any associated activities such as sites for stockpiles, disposal of wastes etc. Instead of burning cleared vegetation, chip or mulch it and reuse it for rehabilitation of affected areas, temporary access tracks, or landscaping. Mulch serves as a seed source, helps to prevent embankment erosion, retains soil moisture and nutrients, and promotes regrowth and weed control. Return topsoil and mulched vegetation (in native vegetation areas) to the same area of the roadside where they come from. Avoid working within the drip-line of trees to avoid damaging the roots and compacting the soil. Reduce the amount of time the ground is exposed or excavation is left open by cleaning 	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
		and re-vegetating the area as soon as possible. <ul style="list-style-type: none"> Ensure that excavation work is done gradually and that re-vegetation is done as soon as possible. Provide workers with adequate information about environmental protection and the importance of avoiding tree felling during construction. Supply appropriate fuel in the work camps to prevent fuelwood collection. 	
Fauna Protection Plan	Construction activities can result in the loss of wildlife habitat and the degradation of habitat quality.		
Construction Work	Impact on migratory birds, their habitat, and their active nests	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Keep construction activities to the designated sites assigned to the contractors. check the site for animals trapped in, or in danger from site works and use a qualified person to relocate the animal. <p>The Contractor shall:</p> <ul style="list-style-type: none"> It is not permitted to destroy active migratory bird nests or eggs. During the bird breeding season, keep tree removal to a minimum. If work must be continued during the bird breeding season, a qualified ecologist will conduct a nest survey 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> Ensure management plan is followed closely

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Vegetation clearing	Clearing vegetation may have an impact on shelter, feeding, and/or breeding, as well as physical destruction and severing of habitat areas.	<p>prior to the start of work to identify and locate active nests.</p> <p>The Contractor shall:</p> <ul style="list-style-type: none"> Restrict the tree removal to the minimum numbers required. Relocate hollows, where appropriate. Fell the hollow-bearing trees in a way that reduces the possibility of fauna mortality. Trees will be inspected for fauna after they have been felled, and if any are found and are easily accessible, they will be removed and relocated, or assistance will be provided if they are injured. After felling, hollow-bearing trees will remain unmoved overnight to allow animals to move of their own volition. 	
Nighttime lighting	Lighting from construction sites and construction camps may affect the visibility of birds that migrate at night and rely on the moon and stars for movement.	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Use lower wattage flat lens fixtures that direct light down and reduce glare, thus reducing light pollution avoiding floodlights unless they are required. Use motion-sensitive lighting to minimise unneeded lighting. 	

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Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Construction camps	Illegal poaching	<ul style="list-style-type: none"> Use, if possible, green lights that are considered as bird's friendly lighting instead of white or red-coloured lights. Install light shades or plan the direction of lights to reduce light spilling outside the construction area. <p>The Contractor shall:</p> <ul style="list-style-type: none"> Provide adequate knowledge to the workers regarding the protection of flora and fauna, and relevant government regulations and punishments for illegal poaching in the Western Area Peninsula National Park. Ensure that employees and subcontractors are properly trained and equipped to identify, address, and report potential environmental issues. 	
Construction	Increased traffic use of the road by construction vehicles will affect the movement of normal road traffics and the safety of the road users.	<p>Road Transport and Road Traffic Management Plan</p> <p>The Contractor shall:</p> <ul style="list-style-type: none"> Strictly follow the Project's Traffic Management Plan' and work with close coordination with the Traffic Management Unit. Place signs in strategic locations along the roads in accordance with sign schedules contained in the national Traffic Regulations. 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> Check records of a road accident and Ensure traffic management plan is followed

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Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
	Accidents and spillage of fuels and chemicals	The Contractor shall: <ul style="list-style-type: none"> Restrict truck deliveries, where practicable, to daytime working hours. Restrict the transport of oversized loads. Operate vehicles, if possible, to nonpeak periods to minimise traffic disruptions. Enforce on-site speed limit. 	
	Construction Camp Management Plan Construction workers' works yards are important locations with significant impacts, such as health and safety hazards on local resources and infrastructure in neighbouring communities.	The Contractor shall: <ul style="list-style-type: none"> Locate the construction camps within the designed sites or at areas that are acceptable from a viewpoint on the environment, culture, or society. Consider locating construction camps away from communities to avoid social conflict over natural resources such as water or to avoid the potential negative effects of the construction camps on the surrounding communities. 	The Environmental Officer at EDSA shall: <ul style="list-style-type: none"> Ensure all management measures here are followed
Siting and location of works yard/campsite	Inadequate infrastructure facilities, such as water supply, housing, and sanitation, will put additional strain on local services.	The Contractor shall: <ul style="list-style-type: none"> provide the following facilities in the works yard/campsite adequate housing for all workers. 	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
	resulting in substandard living conditions and health risks.	<ul style="list-style-type: none"> Safe and reliable water supply, which should meet the national and WBG EHS Guidelines. Drinking water to be chlorinated at source. Toilets and domestic wastewater will be collected by a common sewerage system. Separate latrines and bathing areas for men and women, with complete isolation by location. Sewerage treatment facilities for toilet and domestic waste. Stormwater drainage facilities. 	
Disposal of waste	Management of waste is crucial to minimise impacts on the environment	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Ensure proper solid waste collection and disposal within construction camps. Require waste separation by source at the household level, with organic waste in one container and inorganic waste in another. <p>Store inorganic wastes in a secured location within the household and dispose of organic wastes to waste collectors on a daily basis.</p> <ul style="list-style-type: none"> Setup waste collection, transportation, and disposal systems with the manpower and equipment/vehicles needed. Do not create site-specific waste dumps. All solid waste should be collected and removed 	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Fuel supplies for cooking purposes	Illegal sourcing of fuelwood by construction workers will impact the natural flora and fauna	<p>from the work camps before being disposed of in authorised waste disposal sites.</p> <p>The Contractor shall:</p> <ul style="list-style-type: none"> • Make available alternative fuels like natural gas or kerosene on ration to the workforce to prevent them from using biomass for cooking. • Conduct awareness campaigns to educate workers on preserving and protecting the biodiversity and wildlife of the Project area, and relevant government regulations and punishments on wildlife protection. 	
Health and hygiene	There will be a risk of disease transmission, which will be worsened by poor health and safety measures. There will be a greater danger of sexually transmitted illnesses, HIV/AIDS, and COVID-19 being spread by work teams.	<p>The Contractor shall:</p> <ul style="list-style-type: none"> • Ensure that adequate health care facilities are available within the Project sites. • Ensure that a first-aid station is available 24 hours a day, seven days a week. Maintain an adequate supply of medications in the facility and hire a full-time designated first aider or nurse. Initial health screening of the workers recruited for construction works. • All construction employees should be trained in fundamental cleanliness, health care, and safety procedures, as well as the specific hazards of their jobs. 	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
		<ul style="list-style-type: none"> • Provide frequent HIV awareness programs for all employees, including Sexually Transmitted Infections (STI) and HIV information, education, and communication • Provide adequate drainage facilities at the primary substation facilities to prevent disease vectors such as stagnant water bodies and puddles from forming. Regular mosquito repellent sprays during the rainy season in offices and construction camps and yards. • Not dispose of food waste openly as that will attract rats and stray dogs. • Carry out short training sessions on best hygiene practices to be mandatorily participated in by all workers. Place messages on appropriate hygiene practices on display boards in strategic areas across the camps. All Covid-19 preventative measures shall be followed. 	
Safety	Inadequate security and fire safety facilities at construction camps may result in security issues and fire hazards.	<p>The Contractor shall:</p> <ul style="list-style-type: none"> • Provide appropriate security personnel (police or private security guards) and enclosure to prevent unauthorised entry into the camp area. 	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Site Restoration	Construction camps must be demolished in order to restore them to their former state. The same shall happen at closure.	<ul style="list-style-type: none"> • Maintain register to keep track of a headcount of persons present in the camp at any given time. • Encourage the use of flameproof materials while building labour housing and site offices. Also, make sure that these structures/rooms are well-built and can endure windstorms. • Provide construction camps with the required firefighting equipment. • In strategic locations across the camp, post-emergency contact numbers plainly and publicly. <p>The Contractor shall:</p> <ul style="list-style-type: none"> • Dismantle and remove from the site all facilities established within the construction camp including the perimeter fence and lockable gates after the construction work. • Dismantle camps in stages as the amount of work decreases, rather than waiting for the full job to be accomplished. • During demolition efforts, keep noise levels under national norms. • To encourage recycling or reuse of demolished material, various contractors 	

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Construction activities near-religious and cultural sites	<p>Cultural and Religious Issues</p> <p>Disturbance from construction works to the cultural and religious sites, and contractors' lack of knowledge on cultural issues cause social disturbances.</p>	<p>should be contracted to demolish different structures. Demolition debris should be reused as much as possible. Remove any remaining materials and discard them at the designated dumpsite. Restore sites to its pre-construction state, or to a condition agreed upon with the landowner.</p>	
		<p>The Contractor shall:</p> <ul style="list-style-type: none"> • Communicate to the public through community consultation regarding the scope and schedule of construction, as well as certain construction activities causing disruptions or access restrictions. • Restrict all construction activities within the footprints of the construction sites. • If there are any mosques/religious/educational institutions close to the construction sites and users object, stop construction work that produces noise (especially during prayer time). Stop work immediately and notify the site manager if, during construction, an archaeological or burial site is discovered. It is an offence to recommence work in the 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> • Ensure Contractor follows chance • GRM shall be effective in managing community concerns.

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Worker's Health and Safety Plan		<p>vicinity of the site until approval to continue is given, (see <i>chance find procedure in Annex iii</i>).</p> <ul style="list-style-type: none"> Consult with local authorities to resolve cultural issues. Allow residents to use the Project GRM to lodge complaints and get an amicable resolution. 	
Industry best practices	<p>Construction work can endanger the health and safety of construction workers and site visitors, resulting in serious injuries and or deaths. The population near the construction site, as well as the construction workers, will be exposed to several (i) biophysical health risk factors (e.g. noise, dust, chemicals, construction material, solid waste, wastewater,</p>	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Implement appropriate safety measures for all workers and visitors to the site, which should not fall short of international requirements. (e.g. World Bank Group's 'Environmental Health and Safety Guidelines') and Contractor's national standards or statutory regulations, in addition to complying with national and WBC EHS Guidelines. Provide a safe and healthy working environment for workers, taking into account inherent risks in the construction industry as well as specific classes of hazards in the workplace. Personal protective equipment (PPE) including safety boots, helmets, masks, 	<p>The Environmental Officer at EDSA shall:</p> <ul style="list-style-type: none"> Ensure the approved Occupational Health and Safety Plan is followed. Also, ensure the labour management plan is followed.

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
	<p>vector transmitted diseases, etc.), (ii) risk factors resulting from human behaviour (e.g. STD, HIV, Covid-19, etc.) and (iii) road accidents from construction traffic</p>	<p>gloves, protective clothing, goggles, full-face eye shields, and ear protection for employees. Maintain the PPE by regular cleaning and replacing any that are damaged.</p> <ul style="list-style-type: none"> Safety procedures include the provision of information, training of workers to execute their jobs in a proper manner, and providing protective clothing to workers involved in hazardous operations. Appoint an environment, health, and safety manager to oversee the workers' health and safety. Follow WHO Covid19 guidelines. 	
	Child labour	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Follow in Labour Management Plan in Annex ii 	
Accidents	<p>The lack of first-aid and health-care facilities in the immediate vicinity will aggravate the victims' health conditions.</p>	<p>The Contractor shall:</p> <ul style="list-style-type: none"> Make sure first-aid supplies are readily available. First-aid stations that are properly equipped should be easily accessible throughout the workplace. Record and report workplace accidents, diseases, and incidents. Prevent accidents, injuries, and disease arising from, associated with, or occurring in 	

3.3 ESMP and Monitoring Plan during Operation and Maintenance (O&M) Phase for the Substations and Distribution Lines

As part of the Project, training and manuals shall be provided for the operation and maintenance of the Project infrastructure. During the operation of the Project facility, EDSA shall appoint trained engineers to manage the infrastructure. Much impact is not expected at this stage. However, EDSA shall ensure that the mitigation measures proposed earlier are followed and site-specific plans further developed.

The RoW shall be regularly monitored for vegetation and the restriction of public access enforced.

3.4 ESMP and Monitoring Plan during Decommissioning Phase

Complete decommissioning or closure of a Project of such nature is not feasible. Most importantly, rehabilitation, upgrade, or construction of new facilities are applicable when the need arises. For the proposed Project, EDSA shall be responsible for implementing, monitoring, and continuous improvement of the closure and abatement plan. No detailed decommissioning plan is therefore proposed for this Project. The management control measures required as and when the infrastructure ceases operation shall include dismantling all Project components (including transformers, switch gears, poles, cables, etc.) and removing from site preferably for reuse elsewhere or for recycling of materials or dumped into designated dumpsites.

3.5 Environmental Monitoring

In a bid to enhance the successful implementation of the Environmental Management Plan (EMP), EDSA should provide the necessary support to the environmental officer. Once provided the support, the environmental officer should ensure adequate environmental monitoring in EMP implementation. The environmental officer shall take the overall responsibility for the coordination of the actions required for environmental management and mitigation and monitoring the progress of the proposed management plans and actions to be taken for the Project.

The environmental and social officer shall monitor construction activities and prepare monthly reports to cover all environmental issues. Information on any urgent or significant issues may be prepared at shorter intervals and communicated to relevant stakeholders.

Project Activity/ Impact Source	Environmental Impacts	Management Measures	Monitoring Activities
Campsite/works yard	Inadequate infrastructure facilities, such as water supply, housing, and sanitation, will put additional strain on local services, resulting in substandard living conditions and health risks.	<p>the course of work by minimising, to the greatest extent reasonably practicable, the sources of hazards in accordance with industry best practice.</p> <ul style="list-style-type: none"> Identify potential hazards to workers, particularly those that could be fatal and implement necessary preventive and protective measures. Inform construction workers about the importance of adhering to the rules of the road. <p>To improve health and hygienic conditions, the Contractor shall provide the following facilities in the campsites (Construction Camp Management)</p> <ul style="list-style-type: none"> Adequate ventilation facilities. Safe and reliable water supply. Sewerage system. Stormwater drainage facilities. Security fence at least 2m height. First aid facilities 	

3.5.1 Monitoring Schedule and Parameters

To evaluate the effectiveness of every environmental management programme, monitoring of the key environmental parameters should be undertaken periodically. The schedule, duration and parameters that are to be monitored may vary from time to time.

EDSA shall contract an independent environmental firm to undertake quarterly monitoring and prepare relevant report for submission to the EPA.

Table 3: Monitoring Schedule and Parameters

Description of Parameters	Locations	Schedule and Duration of Monitoring
Air Quality (PM _{2.5} , PM ₁₀ , CO, SO ₂ , O ₃ , TSP etc.)	York and Tombo primary substations and communities along the route	Quarterly
Ambient Noise Levels	York and Tombo primary substations and communities along the route	Quarterly
Water Quality (Surface water quality- Physio-chemical and microbiological analysis)	York and Tombo primary substations and communities along the route	Quarterly
Waste	Primary substation sites	Quarterly
Other Issues	York and Tombo primary substations and communities along the route	Quarterly

3.5.2 Reporting

Deliverables in the form of the summary environmental monitoring reports should be prepared according to any requirements issued by the EPA as part of the Environmental Permit (EIA license).

SECTION 4: GRIEVANCE REDRESS MECHANISM

A systematic and functional Grievance Redress Mechanism (GRM) should be adopted to address the concerns of PAPs and other residents. Such a mechanism should detail the processes involved in registering grievances at no cost to the PAPs. A grievance could mean a simple query or inquiry, concern, issue, or formal complaint that bothers or disturbs the lives of PAPs. The levels of the GRM should be well publicised as a way of educating PAPs and other residents on the process. However, alternative means of access will be the public information centres that will be established at various Project communities. At the same time, information about where complaints can be lodged shall be incorporated into all compensation and/or livelihood restoration agreements. There is a wider public understanding and acceptance of the mechanisms proposed for grievance redress. Similar information will be published on public notice boards, communicated verbally at all public meetings and outreach sessions.

4.1 Rationale for GRM

The primary purpose of the GRM is to hear the complaints or address the concerns of PAPs and related communities to a fair extent and on time. Dissatisfaction can cause an aggrieved PAP or resident to act beyond expectations, culminating in some unforeseen repercussions that would negatively affect Project implementation and stall Project progress. Consequently, the GRM proposed for this Project seeks to achieve the following objectives:

- Encourage registration, acknowledgement, and recording of all concerns or issues raised by the PAPs or stakeholders;
- Identify the frequencies of issues raised: for instance, unpaid compensation, inadequate compensation, disregard for local ritual ceremonies, land acquisition and many more;
- Ensure that complaints are appropriately registered, tracked and documented, with due regard for confidentiality;
- Address the composition of a committee that would handle all grievances;
- Inform people of the public information centre establishment and access;
- Establish procedures for the GRM to enhance easy access, transparency and accountability, and tackle escalation of grievances beyond expectations;

- Manage the concerns raised by PAPs to achieve a win-win situation within a reasonable timeframe that would adhere to national and international best practices; and
- Record all resolutions agreed upon by all parties involved and ensure that aggrieved persons are satisfied with every outcome of remedial resolution to foster harmony in the Project.

4.2 GRM Institutional Framework

A functional Grievance Redress Mechanism (GRM) exists within EDSA for the ESURP and ESURP-AF projects. Residents within the Project area (Western Area) are very convenient with its procedures. Therefore, it is advisable to adopt the same structure for this Project.

This GRM is very systematic and functional to address the concerns of PAPs. Such a mechanism details the processes involved in registering grievances at no cost to the PAPs. The levels/tiers of the GRM shall be well publicised to educate PAPs and other residents on the process. However, alternative means of access will be the public information centres that will be established at the councillor's office. At the same time, information about where complaints can be lodged shall be incorporated into all compensation and or livelihood restoration agreements so that there is a wider public understanding and acceptance of the mechanisms proposed for grievance redress. Similar information should be published on public notice boards communicated verbally at all public meetings and outreach sessions.

The grievance redress process shall follow the following principles:

- **Simplicity:** procedures in filing complaints are understandable to users and easy to recall;
- **Accessibility:** filing complaints is easy through means that are commonly used by stakeholders, especially by the PAPs;
- **Transparency:** information about the system is made widely available to all stakeholders and the general public;
- **Timeliness:** grievances are attended to and resolved on time;
- **Fairness:** feedback or complaints are validated thoroughly and subjects of complaints are given due process and opportunities for appeal;
- **Confidentiality:** the identity of complainants remains confidential;
- Provide multiple uptake points to build trust and confidence in the GRM. Complainants will be provided with multiple channels to submit their complaints;

- Develop a simple system (possibly electronic-based) for receiving, sorting, verifying, and tracking complaints about more effective management of grievances; and
- Publicly disclose the complaints/grievance redress arrangements so that people are aware of where and how complaints will be managed.

4.3 Grievance Procedure

A Grievance Redress Committee (GRC) shall be established and composed of MoE, EDSA, ward councillors, tribal heads and ward committees before the commencement of construction work, and the Engineering, Procurement, and Construction (EPC) contractors shall be briefed of the GRM system. The GRC will be headed by a grievance redress officer at the EDSA and steps will be taken to ensure that all grievances are appropriately documented and updated in a database for tracking of resolution.

The GRC members may require some capacity in managing grievances. Therefore, a budget will be allocated for training and sitting allowances for the GRC members.

Overall, the grievances management steps will include the following:

- Lodge complaints through a phone call, text message, WhatsApp, in-person directly to community influencers, the grievance redress officer at the EDSA or the appeals committee all at the Project level;
- Acknowledgement and registration of complaints within 2 days;
- The investigation, verification, and determination of resolution options. Complaints shall be acted upon within fourteen (14) working days;
- Provision of feedback to the stakeholder regarding resolution and progress towards resolution and complainant satisfaction within 2 days of receipt of resolution outcome;
- Final resolution -tracking and documenting actions and outcomes in the database;
- Where a PAP is fully satisfied with the resolution process, the matter will be formally closed.

If the complainant is dissatisfied with the outcome at the community and EDSA levels, a referral to an appeals committee is required at all the project levels. While the Project will undertake reasonable efforts to resolve all grievances within the project structures, complainants will still have the right to resort to the court of law to get a final settlement where the resolution offered by the Project is not accepted.

EDSA should maintain all records of grievances in a database. The scope of reporting should include:

- Quarterly reporting of grievance mechanism data
- Complaint types, response times, offers of the resolution, and acceptance and complaints resolved vs appealed
- Whether the Project worked to improve processes to eliminate the issue causing a repeated concern
- Track any unresolved or illegitimate complaints where a resolution was offered but not accepted.
- Timeframe to analyse the effectiveness of the GRM and make changes as appropriate

4.4 Levels of Grievance Resolution

Tier 1: Ward councillors and other community influencers shall be the first level to resolve grievances. Councillors, chiefs, headmen, and other community stakeholders are known community structures for dispute resolution who reside in their local communities to be engaged by PAPs more easily. PAPs prefer this easy access and familiar means to settle disputes in their communities. However, to ensure effective grievance management at this level, the councillors should be trained on the resettlement/livelihood processes (*Figure 3*).

Tier 2: When grievances are not resolved at tier 1, PAPs can file a complaint to any person at tier 2. Also, PAPs can directly report a grievance to tier 2. A PAP shall file grievances using a complaint form (*Annex i* for sample form). All written complaints received (or written when presented verbally) and processed through the stages identified in the GRM, will be recorded in a register or log sheet by the Environmental Officer at EDSA and updated in a database. The register presents the date of the complaint, the name of the complainant, the community she/he is from, a description of the complaint, and the actions taken to address the grievance (which shall also note the status of the grievance).

Acknowledgement of receipt of grievance reports should be within seven working days. Outcomes from the decision should be provided within fourteen (14) working days of receiving the complaints, which should be communicated to the PAP. Once a grievance or complaint has been resolved or being escalated, the officer responsible shall complete a Grievance/Complaint Resolution/Escalation Form (*see Annex i* for sample form) to close out the complaint or record the reason for escalation, and the officer and the complainant shall sign the form (if she/he desires), with a witness.

However, where no amicable resolution is reached with the PAP or the PAP does not receive a response from the stakeholders in tier 2, the PAP can appeal to the GRC, which should look at the complaint within fourteen (14) working days.

Tier 3: The court of law will serve as the last resort for all types of grievances. According to grievance redress procedures, PAPs should be exempted from all administrative and legal fees. However, the decision to use the court as a redress mechanism should be left to the discretion of a PAP.

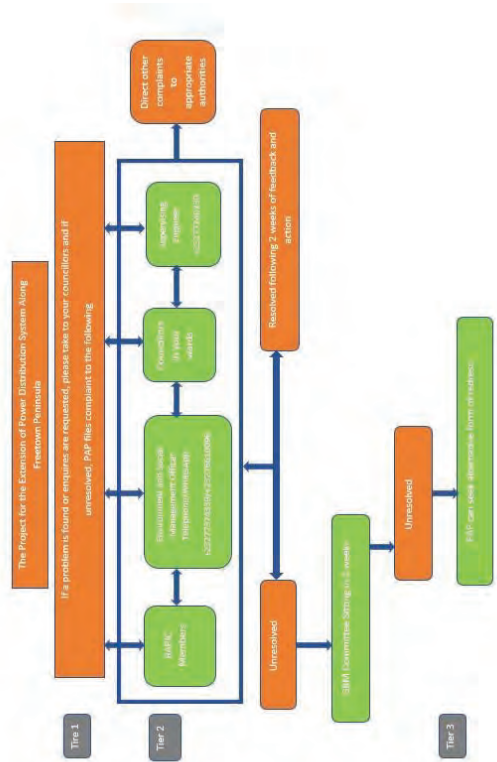


Figure 3: Project GRM Structure

SECTION 5: COMMUNITY DEVELOPMENT ACTION PLAN

The Community Development Action Plan (CDAP) for this Project is geared towards undertaking several development initiatives to improve the existing ones in order to improve the lives of the population in the Project communities. This plan has been developed through social assessment and consultations with residents in the Project communities.

5.1 Profile of Project Area

The socio-economic baseline survey for the distribution line Project covered 35 communities: Adonkia (including SLBC drive, Battalion, Metschem, Angola town, New Jersey, Emergency and Bango Farm), Mile 13, Tombo, Big Water, PWD Compound, Mama Beach, Kossoh Middle Town, Number 2 River, York, Kerry Town, Mambo, Samuel, During, John Obey, Macdonald, Black Johnson, Ogoo Farm, Russel, Boyor, Madina, Hamilton, Kissy Town, Baw Baw, George, Tokeh, Lakka, Sussex and Kent, all in the Western Area Peninsula.

Table 4: Summary of Community Infrastructure

Community Name	Approx. no. of Houses	Main Source of Drinking Water	Other Sources of Water	No. of Pre & Pri. Sch	No. of Sec. Sch (JSS&SSS) & Tertiary Institutions	Type of Health Facility	No. of Churches & Mosques	Types(s) of Cultural site on Row	Other Community Infrastructure
Adonkia (including SLBC drive, Battalion, Metschem, Angola town, New Jersey, Emergency and Bango Farm)	500	Pipe Borne		7+	2+	CHC Hospital	15+		Market
Mile 13 Community	682	Pipe Borne	Stream	3	2	Hospital	7		Bar/Restaurant Hotel
Tombo Community	1705	Pipe borne/ Hand Pump	Well	2+	2+	CHC	4+		Market Radio station Community center Bar/Restaurant Hotel
Big Water	68	Stream		2	0	0	5		
PWD Compound	341			2	0	CHC	4		
Mama Beach	682			4	1	CHC	6		Community center Bar/Restaurant Hotel
Kosso Middle Town	91	Stream							
Number 2 River Community	227	Pipe Borne		1	1		6		Bar/Restaurant Hotel

Community Name	Approx.no. of Houses	Main Source of Drinking Water	Other Sources of Water	No. of Pre & Pri. Sch	No. of Sec. Sch (ISS&SSS) & Tertiary Institutions	Type of Health Facility	No. of Churches & Mosques	Types of Cultural site on Row	Other Community Infrastructure
York Village	227	Pipe borne		1	2	Hospital	4+		Community center Bar/Restaurant Hotel
Kerry Town	100	Hand Pump							
Mambo Community	795	Pipe borne		5+	3+	CHC			Market Bar/Restaurant
Samuel Town	68	Hand Pump		6	4	Hospital	13		Community center
Eduring	91	Pipe borne		2	0		5		Bar/Restaurant
John Obey	307	Hand Pump	Stream	1	1	CHC	6		Community center
Edonald	227	Stream	Well	2	2	CHC Hospital	6+		Market Community center Bar/Restaurants
Black Johnson	68	Stream	Well	0	0	0	3		Community center Hoteles Bar/Restaurants
Ogo Farm Community	1022	Hand Pump	Wells	4	1	CHC	11+		Market Bar/Restaurants Hoteles
Russel	68	Stream	Well	2	1	0	3		Bar/Restaurants
Boyor Village	68	Stream	Well	1	1	0	3		Bar/Restaurants
Madina	114	Stream	Well			None			

Community Name	Approx. no. of Houses	Main Source of Drinking Water	Other Sources of Water	No. of Pre & Pri. Sch	No. of Sec. Sch (ISS&SSS) & Tertiary Institutions	Type of Health Facility	No. of Churches & Mosques	Types of Cultural site on Row	Other Community Infrastructure
Hamilton	1023	Pipe borne	stream	7	3	Hospital	9+		Market Community center Bar/Restaurant
Kissy Town	80	Stream	Well	2	2	CHC	3		Bar/Restaurant Hotel
BawBaw Community	170	Stream	Well	1	1	None	5		Community center Bar/Restaurant Hotel
George Town	80	Stream	Well			None			Hotel
Tokeh Community	386	Stream	Well	2	1	CHC Hospital	9		Community center Bar/Restaurant Hotel
Lakka Community	795	Pipe Borne		7	3	CHC Hospital	15+		Community center Bar/Restaurant Hotel
Sussex	341	Stream	Well	2	2	CHC	4+		Community center Hotel Bar/Restaurant
Kent	150	Stream				None			Bar/Restaurant

5.2 Views from the Neighbouring Communities

From the findings of the socio-economic survey discussions with residents in the project area in January and February 2022, the following development projects have been identified for consideration:

- Provision of additional sources of safe drinking water;
- Provision of proper or good toilet facilities;
- Provision of health infrastructure;
- Provide support to the local fishermen community and/or target women living from fishing activities;
- Provision of educational materials – teaching and learning materials;
- Provision of scholarships for deserving school-going children;
- Provision of employment opportunities for inhabitants of project-affected communities during construction;
- Help with the establishment of a vocational training centre and provision of startup tool kits.

5.3 Projects Recommended for CDAP

From the review of socio-economic information gathered during consultations and further research on the project area, it can be deduced that the Education and Health Care sectors are under the most strain, subsequently impacting the community's socio-economic status. These sectors generally suffer from inadequate or insufficient facilities and infrastructure to cater to the population effectively. In addition to this, some support will be given to the local fishing community.

5.3.1 Education

Educational levels in the country, while having improved slightly in recent years is still considerably low. More children are being enrolled in primary schools, however, the rate of enrolment into secondary schools drops drastically in comparison.

Support to the educational sector can be provided through various initiatives which may be implemented solely by Project Management or in association with other development partners, NGOs etc:

- Furnish and equip some existing primary schools in the Project area to meet the Basic Operational Level (BOL) - safe school infrastructure, clean drinking water, and good sanitation;
- Provision of some teaching and learning materials and aids such as books, black/whiteboards, etc.;
- Provision of scholarships to deserving students at the tertiary level

5.3.2 Health

Across the country, it can be seen that health facilities do not adequately cater for the populations they serve. Where health infrastructures are present, equipment and basic medical facilities are insufficient to meet the demand. In many cases, the hospital beds to patients ratio is one to hundreds and even thousands of patients. Support can be provided through public awareness sensitisation programmes to help promote health awareness within communities. Assistance through providing medical equipment and infrastructure (e.g., beds) or support to local medical/health programs/projects.

5.3.3 Support to Fishing Communities

Artisanal fishing is the primary source of livelihood in many project area communities, mostly engaged in by young men. Women usually buy the catch for sale in Freetown and western markets.

Support to fishing activities can be in the form of provision of fishing nets and other tools and equipment used in fishing/fish trading.

5.4 CDAP Implementation Plan

The overall implementation of the CDAP needs to be funded by EDSA and implemented in collaboration with concerned government agencies, NGOs and the private sector.

There is also a need to form a Community Development Management Committee to steer the development process. The Committee will be responsible for finalising the guidelines included in this CDAP document and coordinating the implementation of the CDAP. Meetings will be held monthly to discuss relevant community development-related matters and monitor the progress of the CDAP relative to targets.

Proposed Membership

- The Western Area Rural District Council
- Community Headmen
- Councilors
- Religious leaders (Christian/Muslim)
- Leaders of the youth groups
- Women's leader
- A representative of the tribal groups

Annex i: Grievance Redressal Form

-GRIEVANCE AND RESOLUTION FORM FOR RESETTLEMENT AND COMPENSATION-

Name (Filer of Complaint):
 ID Number (PAP's ID number):
 Contact Information (house number/ mobile phone) :
 Nature of Grievance or Complaint:

Date: Individuals Contacted: Summary of Discussion:

Signature: Date:
 Signed (Filer of Complaint):
 Name of Person Filing Complaint (if different from Filer):
 Position or Relationship to Filer:

Review/Resolution
 Date of Conciliation Session:
 Was Filer Present?: Yes No
 Was field verification of complaint conducted? Yes No
 Findings of field investigation:.....

Summary of Conciliation Session Discussion.....
 Issues.....

Was agreement reached on the issues? Yes No
 If agreement was reached, detail the agreement below:
 If agreement was not reached, specify the points of disagreement below:

Signed (Conciliator): Signed (Filer):
 Signed:
 (Independent Observer)
 Date:

Table 5: Outline of 5-year Budget for CDAP (2022 – 2026)

PROJECT	RESOURCES	Proposed Budget (Le)					Total
		Yr1 - 2022	Yr2 - 2023	Yr3 - 2024	Yr4 - 2025	Yr5 - 2026	
Support to Education	Scholarships and teaching materials	30,000,000	30,000,000	30,000,000	30,000,000	30,000,000	150,000,000
Support to Health	Funds and materials	30,000,000	30,000,000	30,000,000	30,000,000	30,000,000	150,000,000
Support to Fishermen/ Fishmongers	Funds and materials	40,000,000	40,000,000	40,000,000	40,000,000	40,000,000	200,000,000
Total		100,000,000	100,000,000	100,000,000	100,000,000	100,000,000	500,000,000

5.5 CDAP Monitoring and Evaluation

EDSA shall hire an independent firm to undertake the monitoring and evaluation of the implementation of the CDAP. The monitoring activities shall be conducted annually and reports submitted to the Environment Protection Agency-Sierra Leone.

Annex ii: Labour Management Plan

The Project of Extension of Power Distribution System along the Freetown Peninsula perceives the need to secure the principal rights of workers since the labour force is an important resource. Thus, making sure there is a healthy worker-management rapport, treating workers equitably and providing them with safe working conditions are pivotal components to the sustenance of this Project. This Labour Management Plan (LMP) is for the duration of the Project construction phase. During the construction phase, Project work specifications often determine labour requirements. It is the responsibility of the hired Contractor to recruit personnel for the various classes of workers mentioned below. Although this LMP here is a generic one, it is expected that hired contractors develop specific labour management procedures for the different projects.

The objectives of the labour management procedure are:

- To advance the reasonable treatment, non-segregation, and equivalent opportunity of workers
- To strengthen, maintain, and improve the relationship between workers and management.
- To encourage adherence to national labour and employment regulations.
- To secure workers, including vulnerable categories of workers such as women.
- To improve worker safety and health through promoting safe and healthy working conditions.
- To avoid the use of child or forced labour.

This LMP follows the requirements outlined in ESS2 and it's captured in 1 to 6.

1. Types and Number of Project Workers

The Project will involve the following classes of workers:

Direct Workers

Workers enrolled or engaged directly by the Project to work exclusively with the Project.

Contracted workers

Workers enrolled or engaged through third parties to perform work related to the Project. The precise number of contractors who will be employed is not known as of now. When implementation begins this information will be known. Distribution line

and substation construction include minor construction and rehabilitation and will engage civil works contractors and workers.

Community Workers

Are enrolled from the community or nearby communities where the particular activity takes place. These will be employed on a needs basis.

2. Potential Labour Risks

As per the nature of the project activities, a major labour risk is envisaged.

Labour risks associated with civil works contractor workers: local contractors who will be hired locally will be required to have a written contract consistent with the objective of ESS2, in particular about child and forced labour. The Child Rights Act of 2007 makes provision for the elimination of child labour, protection of children and young persons and prohibition of hazardous child labour.

Labour risks including labour influx and associated Sexual Exploitation and Abuse, Sexual Harassment, child labour and forced labour are viewed as low given the nature of project activities. The risk of forced labour is projected to be minimal because the Project's civil works will be small in scale and shall for the most part require persons with special skills. In any case, the Contractor will be needed in the agreement to make commitments against the utilisation of forced labour, and task the staff responsible for contractor supervision to monitor and report the absence of forced labour.

Occupational Health and Safety (OHS) risks are viewed as low to moderate contingent on the type of Project works to be implemented.

Notwithstanding, since the civil contractors' workers are probably unskilled and untrained neighborhood populace, in any case, hazard remains that a few mishaps may happen that lead to wounds.

All contractors must develop and implement written labour management policies, including procedures to establish and maintain a safe working environment following the requirements of ESS2. As stated in this ESMP, all contractors shall ensure workers will use PPEs, receive basic safety training and other preventive actions as provided. A major risk is associated with climbing on electric poles, hence contractors' ESMP should cover this.

Employment Risks. Workers will be hired by the Project, either directly as Project staff or indirectly as part of contractors or service providers. There is a risk of unaccounted working hours and the lack of overtime compensation. Contractors should be encouraged to treat this as a major concern as it normally leads to an uprising among workers.

3. Working Conditions and Management of Worker Relationship

In line with the requirements of ESS2 and the laws of Sierra Leone, the Project must create and implement human resources policies and procedures that are appropriate for its size and workforce and that outline how it will manage employees.

Documented information that is clear and understandable, regarding their terms and conditions of employment, their rights under the laws of Sierra Leone and any applicable collective agreements, including their rights to work hours, salaries, overtime, compensation, and benefits, shall be delivered by the Project upon instant enrolment and at any major change that may occur.

The Extension of Power Distribution System along the Freetown Peninsula project will base the enrollment on the principle of equitable opportunity, fair treatment and non-discrimination involving recruiting and hiring, pay (including remuneration and benefits), working conditions, and employment terms, training, job assignment, promotion, termination of employment or retirement, and disciplinary practices. Harassment, intimidation, and/or exploitation will be prevented and addressed, particularly in the case of women. The current minimum wage in Sierra Leone is Le 600,000 (USD 52) monthly.

A grievance mechanism for workers to raise workplace concerns is provided for in *section 4* During recruitment, the workers shall be informed of this mechanism and how to access it easily. The mechanism will involve the appropriate level of management and address concerns as soon as possible, utilising a clear and open procedure that gives quick feedback to individuals affected without retaliation. Anonymous complaints should be filed and resolved using this approach. The mechanism will not preclude access to other judicial or administrative remedies available under the law or through current arbitration procedures, nor will it serve as a replacement for grievance mechanisms provided under collective bargaining agreements.

4. Protecting the Workforce

Child Labour:

The Project is not expected to utilise children in any way that is monetarily exploitative or is probably going to be risky or to meddle with the child's education, or to be unsafe to the child's wellbeing or physical, mental, spiritual, moral, or social development.

Under the Child Rights Act of 2007, the minimum age for admission of children into full-time employment is fifteen (15) as per section 125 of the Child Rights Act of 2007 and Section 52 of Chapter 212, Employers and Employed Act. The minimum age for a child's engagement in light work is thirteen (13) as per section 127 subsection one of the Child Right Act of 2007. However, the minimum age for engagement of persons in hazardous work is eighteen (18) as per section 128 subsection of the Child Right Act of 2007 and sections 47-56 of Chapter 212, Employers and Employed Act. The minimum age for employment or engagement set out in the World Bank's ESS 2 is fourteen (14). The Project shall comply with the World Bank's minimum age and that of the laws of Sierra Leone.

This Project shall likewise guarantee that children younger than eighteen (18) are not employed in hazardous work. All work of people younger than eighteen (18) shall depend upon appropriate risk assessment and regular monitoring of health, working conditions, and work hours.

The GoSL has established institutional mechanisms for the enforcement of laws and regulations on child labour which includes the Ministry of Gender and Children's Affairs (MGCA), Ministry of Labour and Social security (MLSS), Ministry of Justice's Director of Public Prosecution, Ministry of Internal Affairs' Police and Transnational and Organized Crime Unit. Their mandates include:

- to formulate, implement, and monitor compliance with child labour regulations through its Child Labour Unit.
- to enforce labour laws in the formal sector.
- to embark on nationwide sensitisation and popularisation of the labour migration policy, impacting child labour.
- to undertake criminal proceedings, including enforcement of criminal laws against forced child labour

If a minor under the minimum age for employment is discovered working on the Project, steps must be made to promptly terminate the minor's employment or involvement in a responsible way, taking into account the minor's best interests.

This Project shall not employ forced labour which consists of any work or service not voluntarily performed.

5. Occupational Health and Safety

This Project shall minimise, prevent, and mitigate accidents, injury, and diseases arising from, or related with, or occur in the course of employment, as far as reasonable and practicable. The Project shall address areas that include the:

- identification of potential workplace dangers, particularly those that could be life-threatening;
- the implementation of preventative and protective actions, such as the modification, substitution, or removal of harmful circumstances or substances;
- worker education;
- recording and reporting of workplace injuries, illnesses, and events; and
- plans for emergency prevention, preparedness, and response.

6. Workers Engaged by Third Parties

The Project shall make reasonable efforts to ascertain that the third parties who engage contracted workers are reputable and legitimate organisations and have an appropriate labour management procedure. The Project shall establish policies and procedures for managing and monitoring the performance of such third-party employers with the requirements of ESS2.

Also, the Project shall incorporate these requirements in contractual agreements with such a third party. A grievance process must be available to contract workers. In the event that the third party employing or engaging the workers is unable to provide a grievance process, the contracted workers will have access to the Project's grievance mechanism.

The following records and reports from contractors' labour management could be examined:

- a sample of employment contracts or agreements between third parties and contracted workers, as well as records of grievances received and resolved; Safety inspection reports, including fatalities and events, as well as the implementation of corrective steps;
- records of non-compliance with national legislation, adherence to the applicable contractor workers code of conduct, and
- records of training given to contracted personnel to discuss occupational health and safety dangers and precautions.

7. Incident and Accident Reporting

In case of manifestation of an incident or accident-related or having an impact on this Project which has, or likely to have, substantial adverse effect on the environment, the affected communities, the public or workers, the implementing agency shall:

- not later than five (5) calendar days after having been informed of such incident or accident, inform JICA by any electronic means of its nature, or circumstance and any effect or impact resulting or likely to result therefrom as soon as reasonable and practicable.
- not later than twenty (20) days after such incident or accident, provide JICA with a summary report that includes a description of the incident or accident, and the measures, if any, that EDSA is taking or plans to take to address it and to prevent any future similar event as reasonable and practicable and
- keep JICA informed of the ongoing implementation of the said measures and plans.

Regular reporting:

- Accidents and grievance logbooks are placed in all construction sites
- The monthly progress report from the supervision consultants will include information on accidents.
- All regular progress reports to JICA shall include information on accidents and incidents
- Any serious injury (requiring off-site medical care) or mortality occurrence must be reported to JICA with basic information within 24 hours, and a complete incident report containing the following must be filed within 10 working days:
 - a. root cause analysis and
 - b. corrective action plan on
 - i. immediate mitigation measures in case of continuing danger (e.g. fencing, signboard, guards)
 - ii. compensate to the affected family (in case of death) based on a clear rationale
 - iii. risk assessment and correct application of ESHS management procedures, and
 - iv. medium- and long-term mitigation measures including enhancement of safety measures, audits, and additional training.

Annex iii: Project Chance Find Procedure

Cultural resources are important sources of valuable historical and scientific information. They are integral parts of a people's cultural identity and practices. This *Annex* outlines actions that will be followed if previously unknown heritage resources, particularly archaeological resources, are encountered during Project construction or operation. JICA/EDSA shall ensure that these procedures are included in projects' bidding and contract documents.

During excavation or construction, the Contractor may come across archaeological sites, historical sites, remnants, and artefacts, including graveyards and/or individual graves. In such situation, the Contractor shall:

- i. Stop work in the area of the fortuitous discovery;
- ii. Mark the location or area where the discovery was made;
- iii. Notify the EDSA environmental officer who intum informs the National Museum (within 24 hours or less);
- iv. Make sure the spot is secure to avoid any harm or loss of removable items . In the case of artifacts that can be removed or delicate remains, 24 hours security will be provided until the National Museum assumes control;
- v. The responsible authorities shall take decisions on how to handle the finding. This could include layout adjustments (such as when an irreplaceable cultural or archaeological relic is discovered), conservation, preservation, restoration, and salvage;
- vi. If the cultural sites and/or relics are of high importance, and site preservation is advised by the relevant, JICA/EDSA would need to make design revisions to accommodate the request and conserve the site;
- vii. Construction works could resume only after permission is granted from the responsible authorities concerning the safeguard of the heritage.

14. Environmental and Social Consideration Survey Report (Resettlement Framework)

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Acronyms and Abbreviation

AIDS	Acquired Immune Deficiency Syndrom	RF	Resettlement Framework
APC	All People's Congress	RIC	RAP Implementation Committee
ARAP	Abbreviated Resettlement Action Plan	RoW	Right-of-Way
CHP	Community Health Post	SLIHS	Sierra Leone Integrated Household Survey
CLSG	CoteD'Ivoire, Liberia, Sierra Leone, and Guinea	SLP	Sierra Leone Police
CSOs	Civil Society Organizations	SLPP	Sierra Leone People's Party
DHMT	District Health Management Team	SLRA	Sierra Leone Roads Authority
ECOWAS	Economic Community Of West Africa States	SPU	Strategic and Policy Unit
ECREEE	Centre for Renewable Energy and Energy Efficiency	SSS	Senior Secondary School
EDSA	Electricity Distribution and Supply Authority	UNOPS	United Nations Office for Project Services
EGTC	Electricity Generation and Transmission Company	USTDA	United States Trade and Development Agency
EIA	Environment Impact Assessment	WAPP	West African Power Pool
EPA-SL	Environmental Protection Agency of Sierra Leone	WARD	Western Area Rural District
EPC	Engineering, Procurement and Construction	WB	World Bank
ESC	Environmental and social Consideration		
ESS	Environmental Social Standard		
ESURP	Energy Sector Utility Reform Project		
ESURP-AF	ESURP Additional Finance		
GoSL	Government of Sierra Leone		
GRC	Grievance Redress Committee		
GRM	Grievance Redress Mechanism		
GST	Government Sales Tax		
HIV	Human Immune Virus		
IDPs	Internally Displaced Persons		
ISC	Inter-Ministerial Sub-Committee		
JICA	Japan International Cooperation Agency		
JSS	Junior Secondary School		
MCHP	Maternal Child Health Post		
MDAs	Ministries Departments and Agencies		
MIC	Ministry of Information and Communication		
MoE	Ministry of Energy		
MoHS	Ministry of Health and Sanitation		
NGOs	Non-Governmental Organizations		
NPA	National Power Authority		
ONS	Office of National Security		
PAPs	Project Affected Persons		
PRSP	President's New Direction National Strategic Plan		

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EXECUTIVE SUMMARY

Project Background

Sierra Leone ranks among countries with the most erratic and lowest electricity supply to the primary populations. Poor access to electricity has been a significant impediment to long-term economic growth in Sierra Leone. The Government of Sierra Leone (GoSL) and development partners have prioritized investing in universal access to electricity in the nation. The Government's medium-term national development goals outline key development targets in the energy sector between 2019-2023.

Japan International Cooperation Agency (JICA), on behalf of the Government of Japan, has executed the following Projects:

- The Project for Urgent Improvement of Power Distribution System in Freetown;
- The Project for Urgent Improvement of Power Distribution System in Freetown (Phase 2);
- The Project for Capacity Development for Maintaining Power Supply Facilities.

GoSL requested Grand Aid for the Project of Extension of Power Distribution System Along the Freetown Peninsula in the Republic of Sierra Leone to the Government of Japan.

This Project aims to expand and stabilize the power supply in the southwest part of the Freetown Peninsula by constructing a new substation and distribution network for poverty reduction, the stability of society, and the establishment of peace in the Freetown Peninsula.

The investments under this operation can create some displacement and or land acquisition issues. Therefore, for this purpose, a Resettlement Framework (RF) following the laws of Sierra Leone, the JICA Guidelines for Environmental Social Considerations (JICA Guidelines) (2010), and the World Bank's Environmental Social Standard (ESS) has been developed.

Project Description

The proposed Project runs from the Goderich substation through Sussex, Tokeh, York, Tombo to Samuel Town. The Project comprises the following components:

- Construction of 33kV overhead line (Goderich SS to Tombo SS)

- Construction of 11kV overhead line (Sussex to Medical Hospital at Kerry Town)
- Construction of 33/11kV Primary substation
 - a) 1x 15MVA 33/11kV Tombo substation
 - b) 1x 15MVA 33/11kV York substation
- Construction of 11/0.4kV Secondary substation at 28 locations
- The procurement of:
 - a) Low voltage facilities (poles, conductors, cables, insulators, power meters)
 - b) Maintenance Tools
 - c) Spare Parts and Consumables
 - d) Rock-breaker¹
- Construction of buildings for substation
- Civil works

Components Entailing Land Acquisition, Restriction on Land Use, and Involuntary Resettlement

The construction of 33kV and 11kV lines shall be mainly done along existing public roads and the existing RoW. YACHYO ENGINEERING CO. LTD are employing options that will not affect assets during stringing along the existing line from Goderich to Sussex. There is a likelihood that the construction of new lines and secondary substations from Sussex to Kerry will affect crops/trees along the RoW.

Objectives of the RF

In particular, the RF:

- Provides guidelines for preparing a Resettlement Action Plan (RAP) or Abbreviated Resettlement Action Plan (ARAP) and undertaking any resettlement activity.
- Provides procedures to follow in a resettlement activity associated with Project investments.
- Sets out the institutional arrangements for undertaking any resettlement activity.
- Describes arrangements for resolving conflicts resulting from Project activities.

Principles of the RF

The RF is guided by the following principles:

- The Project will avoid resettlement where possible.

- Where resettlement is unavoidable, the Project will ensure that every affected household or individual is moved or compensated in an expeditious manner and prior to displacement and/or the start of civil works.
- After relocation, every household or individual is at least well-off, if not better than before the process.
- The Project will ensure effective communication with affected individuals, households and other stakeholders throughout the resettlement/compensation process through a communication strategy.
- The opinion of affected persons and other stakeholders shall be sought through regular public consultations and incorporated into the resettlement planning, decision-making process, and implementation.
- The Project will assist with the physical relocation and provide support to resettled individuals and households during the transition period.
- Ensure Project affected persons have access to functioning grievance redress mechanisms.
- The Project will monitor all aspects of the resettlement program to ensure the RF meets its objectives.

Description of the Project Environment

The Western Area Rural District (WARD), which houses the Freetown Peninsula has its own district council, headed by a chairperson which the people directly elect. Although the WARD has traditionally been a swing district with roughly equal support for the two prominent political parties, the majority of the population has voted for the All People's Congress (APC) in presidential, legislative and local council elections since 2007.

With an intercensal population growth rate of 3.8 percent between 1985 and 2004, the WARD had a census population of 174,249 in 2004. By 2015, the district's population had risen to 444,270 people (221,351 men and 222,919 women), with an intercensal growth rate of 8.5 percent between 2004 and 2015. (Weeks and Bah, 2017).

Waterloo is the district capital and largest city of the WARD. Agriculture and the production of charcoal were the major economic activities for residents in the district, which have reduced drastically. In addition to these, fishing and tourism are other major economic activities. Apart from the established hotels and resorts in the WARD, another important and growing source of income is sand and stone mining, which is fuelled by the high demand for building materials.

The Sierra Leone Government, through the Ministry of Health and Sanitation (MoHS), regulates and supervises healthcare delivery across the country, but it is provided by a variety of entities, including the MoHS, private individuals, and Non-Governmental Organizations (NGOs). In addition to the numerous private health care

establishments in the WARD, including clinics and pharmacies, the District Health Management Team (DHMT) supervises 21 MCHP, 20 CHP, 12 CHC and 1 hospital (OCHA, 2015). That notwithstanding, traditional medicines continue to form part of the primary health care system in the WARD.

The WARD geography is defined by the narrow and nearly parallel ranges of highlands running through the heart of the Freetown Peninsula, and the low-lying Koya plains at the foot of the forest-covered mountain ranges (Cline-Cole, 1987). Along a narrow stretch of seaside beachfront, the hills rise from 200 to 965 meters above sea level.

Much of the land in the WARD is either privately owned in freehold tenure or managed by the Government as land banks for potential national development projects. One of the principal uses of land at the foot of the ridges around the WARD is for housing development. Goderich to Sussex is highly built-up following the end of the war in 2002. The built-up is predominantly influenced by the high demand for housing given the growth in population and the Peninsula Road that has been in construction since 2000. Towards the coastal areas of this zone, low-lying areas are used to cultivate vegetables. Beyond Sussex village are low-density residential areas. The forest covering the high ridges is used for local communities' charcoal burning, woodcutting, and medicinal purposes.

Policy, Legal and Institutional Framework

The following policies, legislations and international guidelines are relevant to resettlement planning and implementation for this Project:

- The Constitution of Sierra Leone, 1991
- The Town and Country Planning Act, 1948, Cap 81 as amended by Act No. 3 of 2001
- National Electricity Act of 2011
- Sierra Leone National Land Policy 2015
- Sierra Leone Roads Authority (Amendment) Act of 2010
- The Local Government Act, 2004
- The Town and Country Planning Amendment Act, 2001
- JICA Guidelines for Environmental and Social Considerations (2010)
- The World Bank Environmental and Social Standard five (ESS 5) on land acquisition, restriction on land use and involuntary resettlement.

The RF assesses the gaps and discrepancies between Sierra Leonean regulations, World Bank ESS5 and the JICA Guidelines (2010). Where there is a discrepancy

between national policy, World Bank ESS5 and the JICA Guidelines, under this Project, the JICA Guidelines and the World Bank's requirement will take precedence as part of the gap-filling measures in the implementation of the RF summarized in Section 3.

Resettlement Related Institutional Framework

The institutional responsibilities related to land acquisition and resettlement in Sierra Leone are summarized as follows:

- (i) the Ministry of Energy (Minister can expropriate land for energy-related projects);
- (ii) the Ministry of Lands Housing and Country Planning (Manages state land, compulsory land acquisition for development projects, planning surveys and mapping, etc.);
- (iii) the Sierra Leone Roads Authority (Manages RoW);
- (iv) Western Rural district councils (involve in project grievance redress process);
- (v) local authorities (responsible for local policy matters; resolving local conflicts; providing orderly leadership at the local level);
- (vi) the Ministry of Agriculture and Forestry (determines rates for crop compensation).

The Electricity Distribution and Supply Authority (EDSA) is designated as the Project proponent by the Ministry of Energy (MoE) in Sierra Leone.

Principles and Objectives Governing Resettlement Preparation and Implementation

The resettlement/livelihood principles adopted for the Project of extension of power distribution system will provide compensation at replacement cost, resettlement and rehabilitation assistance to all Project Affected Persons (PAPs) (loss of space for business and other such immovable properties, and crops), including the informal dwellers/squatters in the Project corridor footprint.

Resettlement Action Plan Preparation

In compliance with JICA Guidelines and World Bank ESS5, resettlement is prepared when people are physically or economically displaced from their land or other assets as a result of such development projects. When appropriately implemented, the resettlement plan should improve PAPs' living standards and livelihoods over and above their pre-displacement levels.

The Project screening was undertaken during the preparation of this RF. The result of the screening process suggests that the Project land acquisition is very minimal, and most of it is on the government RoW. No resettlement is expected. It is also anticipated

that the Project will only cause economic displacement. Hence the ESS5 stipulates that a livelihood plan be prepared

An independent consultant shall be hired to prepare the resettlement/livelihood plan, which will be submitted to JICA for review in order to ensure compliance with JICA Guidelines and World Bank Safeguard policy OP 4.12 (now ESS5).

Eligibility

According to JICA Guidelines and World Bank ESS5, the criteria for determining PAPs eligibility are as follows:

- Those who have formal legal rights to the land or assets they occupy or use;
- Those who do not have formal legal rights to the land or assets but have a claim to land that is recognized or recognizable under national law. Communal lands usually fall in this category;
- Those who have no recognizable legal right or claim to the land or assets they occupy or use. The squatters and encroachers will fall into this category.

The eligibility will be based on the above category of losses before the cut-off date is announced.

Proof of Eligibility

EDSA or contractor undertaking the resettlement/livelihood plan will consider various forms of evidence as proof of eligibility to cover:

- Affected persons with formal legal rights, documents in the form of land title registration certificates, leasehold indentures, tenancy agreements, rent receipts, building and planning permits, business operating licenses, and utility bills. Unprocessed/unregistered formal legal documents will not bar eligibility and procedures for confirming the authenticity of such documents will be established in the resettlement plan.
- Affected persons with no formal or recognized legal rights - Criteria for establishing non-formal, undocumented, or unrecognized claims to eligibility shall be established, paying particular attention to each situation and its peculiarities.

Alternative means of proof of eligibility will include:

- An affidavit signed by landlords and tenants;
- Witnessing or evidence by recognized traditional authority

Valuation Methods

Key points that the valuation will cover are as follows:

1. Collection of all relevant primary and secondary data on the affected property during final detailed valuation inspection and referencing to serve as the basis for assessment of loss; and
2. A comprehensive primary database for monitoring, evaluation and audit.

Some relevant data to be captured by the valuer will be:

- Land
- Buildings (Immovable Structures)
- Crops
- Temporary Structures (Movable Properties)
- Intangible Assets (loss/impact arising from disturbance)
- Loss of income or disruption of livelihoods
- Supplementary assistance (cost of movement, reinstatement of utilities, etc.)

RAP/ARAP Implementation Arrangements

EDSA has a functional implementation arrangement for RAP/ARAP implementations. The implementation arrangement mentioned in Section 8 has been used for the Bo-Kenema Project, the Energy Sector Utility Reform Project (ESURP), and the ESURP Additional Finance (ESURP-AF) implemented in Sierra Leone.

This arrangement can be adopted for the extension of power distribution system along the Freetown Peninsula.

Budget and Source of Funding

The estimated budget for the implementation of this RF is ten thousand five hundred United States dollars (USD 10,500). The budget components include disclosure of RF, establishing a Grievance Redress Mechanism (GRM), training and capacity for all relevant entities, etc.

However, the budget for compensation and livelihood restoration and mitigation measures cannot be determined at this stage and will be costed during implementation when the scope of impacts are well designed. The cost for compensation and resettlement, when defined, will be covered as part of the Project cost.

Grievance Redress Mechanism (GRM)

The primary purpose of the GRM is to hear the complaints or address the concerns of PAPs and related communities to a fair extent and on time. Dissatisfaction can cause

an aggrieved PAP or resident to act beyond expectations, culminating in some unforeseen repercussions that would negatively affect Project implementation and stall Project progress.

A functional Grievance Redress Mechanism (GRM) exists within EDSA for the ESURP and ESURP-AF projects. Residents within the Project area (Western Area) are very convenient with its procedures. Therefore, it is advisable to adopt the same structure for this Project as outlined in **Section 10**.

Consultation and Information Disclosure

The ESS10 provides for Stakeholder Engagement and Information Disclosure process. Details of all public meetings held with people and local government officials shall be documented in a list with dates, locations and the information provided and the major emerging issues. It is recommended that the resettlement/livelihood plan and other documents include this list as an attachment. Where public announcements are made, the details, together with a copy of the text of the announcements, should be provided in the documents.

Consultation during this framework preparation was done openly and transparently. Stakeholders were given notice of the consultation with a Project summary document shared by email or WhatsApp (as convenient for the stakeholders). The stakeholders included the police, local council, traditional leaders, residents, traders along the RoW.

The following tables outline details and outcomes of consultation: Table 14: Consultations Held; Table 15: Summary of Questions from participants and Responses from the consultants; and Table 16: Summary of Responses from Focus Group Discussion Meetings

Monitoring and Evaluation

The MoE will have the overall responsibility for Project coordination, monitoring, and reporting on results achieved in the Project.

EDSA will undertake internal monitoring of the resettlement/rehabilitation operations. The Environmental and Social Management Unit of EDSA is primarily responsible for monitoring resettlement activities. EDSA will produce quarterly reports for the MoE and JICA.

The Project shall incorporate external monitors. Independent monitoring shall be commissioned for the Project. Civil Society Organizations (CSOs) are often suitable for such tasks.

While JICA is taking the lead responsibility, MoE and the Environmental and Social Management Unit of EDSA shall track the preparation and implementation of the resettlement/livelihood plan. Table 17 outlines key monitoring indicators.

SECTION 1: INTRODUCTION

1.1 Project Background

Sierra Leone ranks among countries with the most erratic and lowest electricity supply to the primary populations. The Bumbuna hydroelectric power plant's main power source has a 161kV radial single circuit transmission line with 70 MW. The plant supplies electricity to major cities and towns in the northwest, including Bumbuna, Makeni, Lunsar, Waterloo, and Freetown. Electricity supply efficiency in urban Freetown, which has 17,200 customers (90% of all customers), is about 16%. Only five other district capitals receive intermittent electricity supply from a combination of small diesel units and mini-hydropower plants. As little as 2.5% of the population in rural areas receives electricity supply, even though rural areas account for 57.95% of Sierra Leone's population (World Bank, 2020).

Poor access to electricity has been a significant impediment to long-term economic growth in Sierra Leone. Unfortunately, no country can grow and develop without an adequate electricity supply. Therefore, the Government of Sierra Leone (GoSL) and development partners have prioritized investing in universal access to electricity in the nation. The Government's medium-term national development goals (2019-2023) include:

- increasing electricity generation, transmission, and distribution;
- improving the policy and regulatory environment of the energy sector;
- restoring electricity supply to all district headquarters towns and cities;
- increasing investments in low-cost renewable energy (solar, hydro, wind, and biomass) production and distribution;
- making improvements in governance at all levels of the sector, which includes the Ministry of Energy (MoE), the Electricity Distribution and Supply Authority (EDSA), the Electricity Generation and Transmission Company (EGTC), and the Electricity and Water Regulatory Commission (EWRC) to develop responsible leadership and institutional culture;
- ensuring the expansion of the transmission grid nationwide by increasing the annual regular kilometer coverage;
- ensuring rural electrification is carried out through engagement and involvement of key stakeholders, including the private sector;

- providing tax incentives as part of a broader commitment to the off-grid sector in the Finance Act, which includes provisions for a duty waiver and Government Sales Tax (GST) extension; and
- undertaking Multi-Tier Framework surveys to provide data on energy consumption (including mini-grids).

Existing donor and foreign investment projects that are geared towards the achievement of these goals include:

- a 6MW plant being constructed at Newton, and
- the Bumbuna Phase II project,
- the United States Trade and Development Agency (USTDA) – solar off-grid project,
- the United Nations Office for Project Services (UNOPS) for Rural Renewable Energy Project,
- the ECOWAS Centre for Renewable Energy and Energy Efficiency (ECREEE) – Solar off-grid project,
- the West African Power Pool (WAPP) – Cote D'Ivoire, Liberia, Sierra Leone and Guinea (CLSG) Power Interconnection Project, and
- Indian Exim Bank - constructing transmission lines and substations from Bumbuna to Freetown.
- Japan International Cooperation Agency (JICA), on behalf of the Government of Japan, has executed the following projects:
 - The Project for Urgent Improvement of Power Distribution System in Freetown;
 - The Project for Urgent Improvement of Power Distribution System in Freetown (Phase 2);
 - The Project for Capacity Development for Maintaining Power Supply Facilities.

According to the Sierra Leone Integrated Household Survey (SLIHS) of 2018, 21.0% of households have electricity in their dwellings via the national grid, with an average of 15.5 hours a week of electricity.

Concerned about the worsening electricity/energy situation in the city, in 2018, His Excellency the President's New Direction National Strategic Plan (PRSP IV) on the energy sector identified a road map to increase energy access and improve service delivery nationwide. This mandate is aligned with the Ministry of Energy's Sector Strategic Plan (2018-2030), which now embarks on an urban electrification project to extend the distribution network from Goderich to Waterloo via Sussex, Tokoh, York,

Kent, and Tombo communities. The Republic of Sierra Leone Government requested Grand Aid for the Project for Extension of Power Distribution System Along the Freetown Peninsula in the Republic of Sierra Leone to the Government of Japan. The Government of Japan is expected to grant the Government of Sierra Leone aid to develop the distribution network along the Freetown Peninsula. This Project aims to expand and stabilize the power supply in the southwest part of the Freetown Peninsula by constructing a new substation and distribution network for poverty reduction, the stability of society, and the establishment of peace in the Freetown Peninsula. As part of the Project development procedures, risks associated with this Project's development are placed under "Category B" by the Environmental Protection Agency of Sierra Leone (EPA-SL) based on the assessment undertaken for the Project.

The investments under this operation, mainly the construction of distribution lines and substations, can create some displacement and or land acquisition issues. Therefore, for this purpose, a Resettlement Framework (RF) following the laws of Sierra Leone, the JICA Guidelines, and the World Bank's Environmental Social Standard (ESS) has been developed.

1.2 Project Description

The proposed Project is located along the Freetown Peninsula. It runs from the Goderich substation through Sussex, Tokoh, York, Tombo to Kerry Town. The Project comprises the following components (*see Table 1*)

Table 1: Project Components

No	Components	Quantities
Procurement and Installation Work		
1	Construction of 33kV line (Goderich SS to Tombo SS) (a) 33kV overhead line	Approx. 46km
2	Construction of 11kV line (Sussex to Medical Hospital at Kerry Town) (a) 11kV overhead line	Approx. 52km
3	Construction of 33/11kV Primary substation (a) 1x 15MVA 33/11kV Tombo substation (b) 1x 15MVA 33/11kV York substation	1 lot 1 lot
4	Construction of 11/0.4kV Secondary substation (a) 100kVA Pole-mount type	28 locations 6 lot

	(b) 250kVA Pole-mount type (c) 2x250kVA Pole-mount type (d) 315kVA Ground-mount type (e) 630kVA Ground-mount type	11 lot 5 lot 4 lot 2 lot
Procurement Work		
5	Low voltage facilities (poles, conductors, cables, insulators, power meters)	1 lot
6	Maintenance Tools	1 lot
7	Spare Parts and Consumables	1 lot
8	Rock-breaker ¹	1 set
Construction Work		
9	Construction of buildings for substation	2 buildings
10	Civil works	1 lot

NOTE:

Macdonald and Samuel town will be supplied power from Waterloo substation. Note that contents and quantities are subject to change.

The Project shall use the Right-of-Way (RoW) for the most part. The RoW is the parcel of land reserve between the edge of our road to the approved offset varying with the road class. This parcel of land is mainly reserved for future development, provides access for other utility companies like EDSA, and provides road users the required safety and level of service. The RoW is state-owned land, and the GoSL has vested it in the Sierra Leone Roads Authority (SLRA). Over time, the RoW has faced encroachment in the country. Since the Project will induce displacement involving one makeshift structure at Tombo, EDSA shall pay compensation regardless of land ownership status as per the national laws and ESS5: Land Acquisition, Restrictions on Land Use and Involuntary Resettlement.

1.3 Components Entailing Land Acquisition, Restriction on Land Use, and Involuntary Resettlement

The construction of 33kV and 11kV distribution lines shall be mainly constructed along existing public roads and the existing RoW. Many traders and small businesses have occupied the RoW between Goderich substation and Sussex. From preliminary field assessments along the said route, it is estimated that around 66 persons might be affected by the Project (*see Annex i*). However, this number will significantly be reduced or non will be affected if considerations on construction options are made.

There is a likelihood that the construction of new lines and secondary substations from Sussex to Kerry Town will affect crops/trees along the RoW.

The land parcels for the proposed primary substation sites at York and Tombo are owned by the Sierra Leone Police and Tombo community. EDSA is in the process of acquiring those parcels of land for the Project. The land acquisition process is expected to be voluntary transactions and no displacements of persons will be involved. Therefore, ESS5 may not apply to this component. However, the land acquisition process shall be screened following ESS5 requirements and probably subject to an audit.

Table 2 and Table 3 represent the proposed Project intervention and land acquisition, respectively.

Table 2: Proposed Project Intervention that Triggers ESS5

Proposed Intervention	Project Activity	Implications for ESS5
<ul style="list-style-type: none"> Construction of distribution lines 	<ul style="list-style-type: none"> Excavation of pole locations Installation of new poles and towers Stringing of lines 	ESS5 is triggered. This will entail the economic displacement of PAPs along the RoW.
<ul style="list-style-type: none"> Construction of secondary substations 	<ul style="list-style-type: none"> Excavation for pole or pad construction Installations of poles to host transformers 	ESS5 is triggered. Involves temporary/permanent and minor economic displacement of PAPs.

The World Bank Environmental and Social Standard 5 (ESS5) is triggered in this Project since the Project activities will cause economic displacement and/or restrictions to income sources. According to the ESS5, a resettlement plan (including measures to address physical and/or economic displacement) should be prepared regardless of the number of persons affected. However, a 'livelihood plan' is prepared when Project activities only involve economic displacement. Therefore, it is expected that a livelihood plan should be prepared for the extension of power distribution system along the Freetown Peninsula Project.

Table 3: Project Land Requirement

No	Project Components	Land Required
1.	York Substation	1,500m ²
2.	Tombo Substation	770m ²
3.	33kV Distribution Line (from Goderich Substation to Tombo Substation)	Approx. 46km RoW 6m (3m + 3m)
4.	11kV Distribution Line (from Sussex to Kerry Town)	Approx. 52km RoW 6m (3m + 3m)
5.	11/0.4kV Secondary Substation	Approx. 28 locations Land required: 448m ² (4 x 4m/set x 28set)

1.3.1 Description of the Potential Impacts of the Project

The nature of Project impacts will likely include temporary loss of business centres, permanent loss of business centres, the loss of income sources or means of livelihood, and destruction of economic crops on the RoW for the lines to be constructed.

1.4 Objectives of the RF

According to the ESS5, the purpose of the resettlement framework is to clarify resettlement principles, organizational arrangements, and design criteria to be applied to Project components to be prepared during Project implementation.

In particular, the RF:

- Provides guidelines for preparing a Resettlement Action Plan (RAP) or Abbreviated Resettlement Action Plan (ARAP) and undertaking any resettlement activity.
- Provides procedures to follow in a resettlement activity associated with Project investments.
- Sets out the institutional arrangements for undertaking any resettlement activity.
- Describes arrangements for resolving conflicts resulting from Project activities.

The Ministry of Energy (MoE) and EDSA shall be committed to resettlement based on national laws, the JICA Guidelines and ESS5. This should be designed to improve the local conditions and economic opportunities in the communities affected by the Project.

1.5 Principles of Resettlement/Displacement

The RF is guided by the following principles:

- The Project shall avoid resettlement where possible.
- Where resettlement is unavoidable, the Project will ensure that every affected household or individual is moved or compensated expeditiously and before displacement and/or the start of civil works.
- Help resettled households or individuals to improve their former living standards at least.
- The Project shall ensure effective communication with affected individuals, households and other stakeholders throughout the resettlement/compensation process through a communication strategy.
- The opinion of affected persons and other stakeholders shall be sought through regular public consultations and incorporated into the resettlement planning, decision-making process, and implementation.
- The Project shall assist with the physical relocation and support resettled individuals and households during the transition period.
- The Project shall monitor all aspects of the resettlement program to ensure the resettlement plan prepared meets its objectives.
- Ensure Project affected persons have access to functioning grievance redress mechanisms.

SECTION 2: DESCRIPTION OF THE PROJECT ENVIRONMENT

2.1 Political Context

Since Sierra Leone's independence from the British colony in 1961, two main political parties have largely shaped the country's political history: the Sierra Leone People's Party (SLPP) and the All People's Congress (APC) (McIntyre, et al 2002). While the SLPP has a solid political base in the country's southern and eastern areas, where it gets the majority of its votes during elections, the APC has a solid political base in the country's northern and western regions. Like the other 15 political districts, the Western Area Rural District (WARD) has its own district council, headed by a chairperson who the people directly elected (*Figure 1*). Although the WARD has traditionally been a swing district with roughly equal support for the two prominent political parties, the majority of the population has voted for the APC in presidential, legislative and local council elections since 2007. The re-introduction of local governance in 2004 was intended for individuals at the community level to participate in designing programmes that can develop their communities directly.

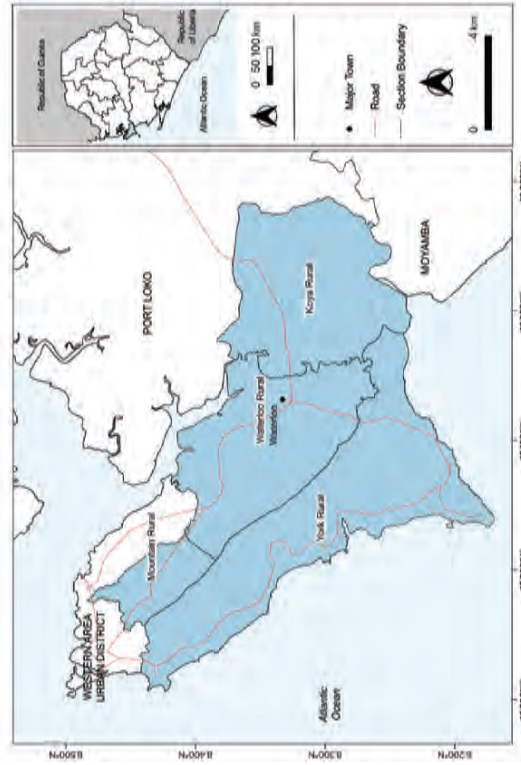


Figure 1: Map of Western Area Rural District Showing the Sections

2.2 Population Growth

According to the 2015 Housing and Population Census, Sierra Leone has a total area of 72,300 km² and a population of 7,076,119 people (this includes 7,076,119 people in households and 15,994 people in institutions) (Statistics Sierra Leone, 2015). The rural areas account for 59% of the population, while the urban areas account for 41%. The report also reveals that the Northern Region is the most populous, with 2,508,201 people, followed by the Eastern Region (1,642,367 people), the Western Area (1,500,238 people) and the Southern Region (1,441,308 people).

With an intercensal population growth rate of 3.8 percent between 1985 and 2004, the WARD had a census population of 174,249 in 2004. By 2015, the district's population had risen to 444,270 people (221,351 men and 222,919 women), with an intercensal growth rate of 8.5 percent between 2004 and 2015. (Weeks and Bah, 2017). The increase in population has partly been attributed to post-conflict urbanisation, which is underpinned by perceived opportunities available in Freetown, Sierra Leone's capital and largest city. During Sierra Leone civil conflict (1991-2002), the Western Area was a safe haven for Internally Displaced Persons (IDPs) from other parts of the country, as it remained insulated from rebel invasion until 1997. The growth in population and the corresponding demand for housing infrastructure has tremendously contributed to the conurbation of the two districts constituting the Western Area (WAUD and WARD).

2.3 The Socio-Economic Characteristics

Waterloo is the district capital and largest city of the Western Area Rural District (WARD). The city, founded in 1891 as a settlement for liberated Africans, has provided administrative services and serves as an economic hub for the district. Before the decade-long civil war that engulfed the country between 1990 and 2002, agriculture was the main stay of people in the WARD. In addition to peri-urban agriculture, which included the cultivation of vegetables (lettuce, tomatoes, cucumber, spinach, spring onions and runner beans), poultry farming and fishing for supplying Freetown, the country's capital and largest city, the production of charcoal was a major economic activity for residents in the district (Thomton et al, 2012). These activities gained momentum when the war intensified in 2007, which saw the mass displacement of people in the rural areas that later sought refuge in the Western Area. The WARD was home to almost all of the Internally Displaced Persons (IDP) camps in the Western Area.

The IDPs leverage their agricultural skills by engaging in food production within the WARD. This was possible because, until 2007, the Western Area was the only insulated region from rebel activities. Many of the IDPs stayed in the city after the conflict finished in 2002, including ex-combatants who had difficulties returning to their home villages, which were often outside of WARD. Not only did this result in rapid population expansion, but it also led in a significant increase in population, which has changed the landscape of the WARD. Although urban agriculture continues to be an important economic activity, many residents have resulted in petty trading. Waterloo, for instance, currently serves as the centre for a more significant majority of haulage trucks that transport vegetables from the provinces. In addition to these, tourism is another major economic activity. Apart from the established hotels and resorts in the WARD, another important and growing source of income is sand and stone mining, which is fuelled by the high demand for building materials.

2.4 Health Care

The Sierra Leone Government, through the Ministry of Health and Sanitation (MoHS), regulates and supervises healthcare delivery across the country, but it is provided by a variety of entities, including the MoHS, private individuals, and non-governmental organizations (NGOs). The MoHS provide health care services at four levels; the first level at the Maternal Child Health Post (MCHP), the second at the Community Health Post (CHP), the third at Community Health Centre (CHC), and the fourth at the hospital. In addition to the numerous private health care establishments, including clinics and pharmacies, the District Health Management Team (DHMT) supervises 21 MCHP, 20 CHP, 12 CHC and 1 hospital (OCHA, 2015). That notwithstanding, traditional medicines continue to form part of the primary health care system in the WARD.

2.5 Topography

The WARD geography is defined by the narrow and nearly parallel Ranges of highlands running through the heart of the Freetown Peninsula and the low-lying Koya plains at the foot of the forest-covered mountain ranges (Cline-Cole, 1987). Along a narrow stretch of seaside beachfront, the hills rise from 200 to 965 meters above sea level. The ranges' highest points, Sugar Loaf Mountain and Picket Hill, are made up of basic and ultra-basic rocks (Larbi, 2011). This undulating landscape is approximately 37 kilometres long and 14 kilometres wide (Okoni-Williams et al., 2001). While describing the region's scenery, Munro (2009) remarked that this is likely

the only spot in West Africa where mountains rise from the shore. The rising mountain ranges from the shore influence the region's weather and climate patterns.

2.6 Land Use

The land tenure system has a significant impact on land use. Sierra Leone's dualistic land tenure system results from British colonial administrations that ruled the country until 1961 (Njoh & Akiwumi, 2012). Unlike the communal and customary property ownership in the provinces, where the Paramount Chiefs are the stewards of the land, a nineteenth-century statutory English Land Law that guarantees absolute freehold regulates land ownership in the WA (Renner-Thomas, 2010; Turay, 2006). This meant that, unlike in the provinces, where social capital (kinship and ties) determined who owned and controlled land, the cash economy is the principal determinant of who owned and controlled land in the Wester Area. Much of the land in the WARD is either privately owned in freehold tenure or managed by the Government as land banks for potential national development projects. One of the principal uses of land at the foot of the ridges around WARD is for housing development. Goderich to Sussex is highly built-up following the end of the war in 2002. The built-up is predominantly influenced by the high demand for housing given the growth in population and the Peninsula Road that has been in construction since 2000. Towards the coastal areas of this zone, low-lying areas are used to cultivate vegetables. Beyond Sussex village are low-density residential areas. Given the rate of development that the region is witnessing, it is anticipated that the area will become densely populated in the next five years. The forest covering the high ridges is used for local communities' charcoal burning, woodcutting, and medicinal purposes.

2.7 Community Infrastructure

Table 4 presents key community infrastructure in the Project area.

Table 4: Summary of Community Infrastructure

Community Name	Approx. no. of houses	Main Source of drinking Water	Other sources of water	No. of pre & Pri. Sch	No. of Sec. Sch (JSS&SSS) & tertiary institution	Type of Health Facility	No of Churches & Mosques	Type(s) of cultural site on Row	Other community infrastructure
Adonkia (including SLBC drive, Battalion, Metschem, Angola town, New Jersey, Emergency and Bango Farm)	500	Pipe Borne		7+	2+	CHC Hospital	15+		Market
Mile 13 Community	682	Pipe Borne	Stream	3	2	Hospital	7		Bar/Restaurant Hotel
Tombo Community	1705	Pipe borne/ Hand Pump	Well	2+	2+	CHC	4+		Market Radio station Community center Bar/Restaurant Hotel

Community Name	Approx. no. of houses	Main Source of drinking Water	Other sources of water	No. of pre & Pri. Sch	No. of Sec. Sch (JSS&SSS) & tertiary institution	Type of Health Facility	No of Churches & Mosques	Type(s) of cultural site on Row	Other community infrastructure
Big Water	68	Stream		2	0	0	5		
PWD Compound	341			2	0	CHC	4		
Mama Beach	682			4	1	CHC	6		Community center Bar/Restaurant Hotel
Kosso Middle Town	91	Stream							

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Community Name	Approx. no. of houses	Main Source of drinking Water	Other sources of water	No. of pre & Pri. Sch	No. of Sec. Sch (JSS&SSS) & tertiary institution	Type of Health Facility	No of Churches & Mosques	Type(s) of cultural site on Row	Other community infrastructure
Number 2 River Community	227	Pipe Borne		1	5		6		Bar/Restaurant Hotel
York Village	227	Pipe Borne		1	2	Hospital	4+		Community center Bar/Restaurant Hotel
Kerry Town	100	Hand Pump							
Mambo Community	795	Pipe Borne		5+	3+	CHC			Market Bar/Restaurant
Samuel Town	68	Hand Pump		6	4	Hospital	13		Community center
During	91	Pipe Borne		2	0		5		Bar/Restaurant

Community Name	Approx. no. of houses	Main Source of drinking Water	Other sources of water	No. of pre & Pri. Sch	No. of Sec. Sch (JSS&SSS) & tertiary institution	Type of Health Facility	No of Churches & Mosques	Type(s) of cultural site on Row	Other community infrastructure
John Obey	307	Hand Pump	Stream	1	1	CHC	6		Community center
Macdonald	227	Stream	Well	2	2	CHC Hospital	6+		Market Community center Bar/Restaurants
Black Johnson	68	Stream	Well	0	0	0	3		Community center Hotels Bar/Restaurants
Ogogo Farm community	1022	Hand Pump	Wells	4	1	CHC	11+		Market Bar/Restaurants
Russel	68	Stream	Well	2	1	0	3		Hotels Bar/Restaurants

Community Name	Approx. no. of houses	Main Source of drinking Water	Other sources of water	No. of pre & Pri. Sch	No. of Sec. Sch (JSS&SSS) & tertiary institution	Type of Health Facility	No of Churches & Mosques	Type(s) of cultural site on Row	Other community infrastructure
Boyor Village	68	Stream	Well	1	1	0	3		Bar/Restaurants
Madina	114	Stream	Well			None			
Hamilton	1023	Pipe borne	stream	7	3	Hospital	9+		Market Community center Bar/Restaurant
Kissy Town	80	Stream	Well	2	2	CHC	3		Bar/Restaurant Hotel
BawBaw Community	170	Stream	Well	1	1	None	5		Community center Bar/Restaurant Hotel
George Town	80	Stream	Well			None			

2.8 Land Ownership Structure

In Sierra Leone, land is categorized as state land, private land, or communal land. The primary statutory law governing the acquisition of land in the provinces is the Provinces Land Act of 1927, Cap 122, alongside customary law. Under the customary law, at least three different types of land tenure arrangements are recognized – family tenure, communal tenure, and individual tenure. According to Renner-Thomas, 2010, family tenure is the most widespread.

Customary land tenure systems are not uniform across the country and vary from one ethnic group to the other. However, in customary law land is vested in tribal authorities who include Paramount Chiefs and their Chiefdom Councilors who serve as custodians of the land. It is considered that land in the provinces is held by ancestors, living community members, and unborn family members (Williams, 2006). The management and preservation of the land is in the hands of the current generation who does so in the interest of the ancestors and future generations. Much of the land has been individualized in the names of lineages, families, and individuals (Unruh and Turay 2006; Dale 2008). Extended families hold most chieftaincy land. Families have rights of access, use, and transfer by lease. In some areas, people outside the chiefdom (known as "strangers") are not allowed to own land exclusively. They lease land from landowning families and they ("strangers") pay a nominal amount of the crop yield to the family. Rights to sell chieftaincy land are generally limited to sales within the family or community. Some chieftaincy land is retained as communal land for community use (Williams, 2006; Unruh and Turay 2006; Dale 2008). Chieftaincy land under customary tenure can be obtained by purchase (citizens only) or lease. Private and chieftaincy land that has been individualized into family holdings can be transferred by inheritance. Land transfers of family holdings of chieftaincy land are subject to the approval of all family members and the paramount chief. Chiefs may lease communal land that has not been individualized as a family or individual holding (Unruh and Turay 2006). The Government can compulsorily acquire land in Sierra Leone - the 1991 Constitution of Sierra Leone provides that no property shall be taken except where "necessary in the interests of defense, public safety, public order, public morality, public health, town and country planning," and for "promotion of public benefit or public welfare." Under such circumstances, there must be "prompt payment of adequate compensation." Constitutional protections do not apply for takings based on other legal authority, including for purposes of "carrying out . . . agricultural development or

Community Name	Approx. no. of houses	Main Source of drinking Water	Other sources of water	No. of pre & Pri. Sch	No. of Sec. Sch (JSS&SSS) & tertiary institution	Type of Health Facility	No of Churches & Mosques	Type(s) of cultural site on Row	Other community infrastructure
Akokoh Community	386	Stream	Well	2	1	CHC Hospital	9		Community center Bar/Restaurant Hotel
Kakka Community	795	Pipe Borne		7	3	CHC Hospital	15+		Community center Bar/Restaurant Hotel
Busseck Community	341	Stream	Well	2	2	CHC	4+		Community center Hotel Bar/Restaurant
Went	150	Stream				None			

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improvement which the owner or occupier of the land has been required, and without reasonable or lawful excuse refused or failed to carry out.”

SECTION 3: POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

This section discusses the legal and institutional framework relating to land acquisition and involuntary resettlement in Sierra Leone, the World Bank ESS5 (Environmental and Social Standard 5) requirements, and the JICA Guidelines. The relevant national environmental and other statutory laws and legislation relevant to the Project are discussed below.

3.1 National Environmental and other Statutory Laws and Legislations

3.1.1 The Constitution of Sierra Leone, 1991

The 1991 constitution of Sierra Leone Act No 6, section 21 gives ultimate protection to individual property rights. It categorically states that *“no property of any description shall be compulsorily taken possession of, and no interest in or right over property of any description shall be compulsorily acquired, except where the following conditions are satisfied, that is to say— a. the taking of possession or acquisition is necessary in the interests of defence, public safety, public order, public morality, public health, town and country planning, the development or utilization of any property in such a manner as to promote the public benefit or the public welfare of citizens of Sierra Leone; and c. provision is made by a law applicable to that taking of possession or acquisition — i. for the prompt payment of adequate compensation; and ii. securing to any person having an interest in or right over the property, a right of access to the court or other impartial and independent authority for the determination of his interest or right, the legality of the taking of possession or acquisition of the property, interest or right, and the amount of any compensation to which he is entitled and for the purpose of obtaining prompt payment of that compensation.”*

Therefore, the constitution gives the right to expropriation or compulsory acquisition of private properties for developments/projects that promote the public benefit or the public welfare of citizens of Sierra Leone. However, prompt and adequate compensation should be made in such a situation.

Relevance to the Resettlement Plan: The Constitution of Sierra Leone makes provision for the protection of the rights of individuals to private property, but it also makes provision for the compulsory acquisition of land where it is in the public interest.

Critically, the Constitution requires that individuals who are deprived of their property should be provided with prompt and fair compensation.

3.1.2 The Town and Country Planning Act, 1948, Cap 81 as amended by Act No. 3 of 2001

This act sets the rules for the definition of Planning Areas and Schemes. The 2001 Amendment gives power to the Minister of Lands, Housing, and Country Planning to make a scheme for any part of the country. The Project of the Expansion for Power Distribution System can, therefore, be covered by a planning area or scheme; hence the minister can expropriate land in such a case.

Section 5 of the Amendment Act states:

"When an area has been declared a planning area the value of any building or land in such area shall, for the purposes of determining the amount of compensation or betterment payable under the provisions of this Act, be deemed to be the value of the building or land at the date of such declaration."

Relevance to the Resettlement Plan: This Act also makes provision for compulsory acquisition for planning scheme, in which case compensation for the said property to be done at current market value.

3.1.3 National Electricity Act of 2011

This Act unbundles the former National Power Authority (NPA) to two separate entities:

- Electricity Generation and Transmission Company (EGTC)
- Electricity Distribution and Supply Authority (EDSA)

Part VI outlines EDSA's principal function as the supply, distribution, and retail sale of electricity for the entire country except in areas where a license has been issued to another qualified entity.

Part X of the National Electricity Act of 2011 deals with land acquisition and related environmental practices. This Act gives the Minister powers to acquire land for EGTC or EDSA or both even if the land is private or some private interest in the land subject to payment of adequate compensation. Compensation of such land is paid by the GoSL firstly and the Authority or company will reimburse the Government at a later time.

During the life of EGTC or EDSA or both will at any time decide to sell, lease, or dispose of any land easement, property, or interest in any land or waterway in a proper manner.

This Act gives the authority for breaking streets to lay any supply line at any height across any street or road and the erection of poles and any other erections for the purpose. The company or Authority should consult the relevant ministry before breaking any street and they should make good the street or road after the breakage.

Section 58 of the National Electricity Act 2011, gives the power to cut or lop any tree shrub or hedge, which obstructs or interferes with any supply line of the company or the authority, the laying or erection of any supply line or proposed route of the supply. A fourteen days' notice should be given to the occupier of the land before the lopping and cutting of any tree, shrub or hedge.

Sections 59 and 60 of the said Act talk about the power to enter land acquired by the Authority or company for a certain purpose; given reasonable notice to the occupier of any land with the intention to enter and notice of the intention to enter and construct respectively.

Electric cables should not be placed across any navigable waterway, whether above or below or underground, without the consent and approval of the Minister.

Finally, all companies or independent power producers should comply with all environmental health and safety legislations as per section 62.

Relevance to the Resettlement Plan: Under this Act, the Minister of Energy can also acquire land for EGTC or EDSA or both whether the land is private or some private interest in the land subject to payment of adequate compensation. This Act further gives the authority for breaking streets to lay any supply line at any height across any street or road and the erection of poles and any other erections for the purpose.

3.1.4 Sierra Leone Roads Authority (Amendment) Act of 2010

The Sierra Leone Roads Authority (SLRA) Act of 2010 is an amendment of the SLRA Act of 1992. The Authority has the legal mandate to set out the width of the Right of Way (RoW) as per the amendment of Act No.2 of 1992 section 5 subsection 2 paragraph C, which states "For the attainment of the object stated in subsection 1 the Authority shall set the width of the right of way for roads which forms part of the national network".

The SLRA is the institution responsible for managing roads in the country. Their mandate is to develop and maintain the national roads network, advise the

Government on general road policies, and contribute to addressing transport concerns. The SLRA manages RoW issues in Sierra Leone.

Relevance to the Resettlement Plan: Any new roads or alteration of existing roads should be authorised by the SLRA. Most of the Project routes will be constructed along the RoW. SLRA should guide in this regard.

3.1.5 Local Government Act, 2004

This Act focuses on having a meaningful decentralization and devolution of Government functions through establishing and operating local councils around the country. It recognizes local councils as 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. Local councils shall be responsible, generally for promoting the development of the locality and the people's welfare 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 organizations, and the private sector. Local councils have the responsibility to prepare a development plan, which shall guide the development of the locality.

The Act recognises Land Valuation Committees of District Councils. The Land Valuation Committees of District Councils aim at delivering an open, timely, and cost-effective valuation service, with the view to supporting economic development and poverty reduction.

Their main functions are:

- Determine all matters of compensation for land compulsorily acquired by Government, any organ of Government, or Public Corporation;
- Prepare the valuation list for property rating purposes for the District Councils, updating and maintaining the valuation list;
- Undertake valuation of immovable properties including land, buildings, furniture, crops, plant and machinery and other effects, for any purpose, for Government agencies, or any organ of the Government;
- Determine the rental values of all properties of which the District Council is the owner, tenant, or prospective tenant;
- Advise all organs of the District Councils on all matters of valuation of an interest in immovable properties;
- Advise the Forestry Department on royalty payments on forestry holdings and products;
- Monitor private valuation activities to protect the national interest;

- Advise on mining issues as they relate to compensation.

Relevance to the Resettlement Plan: The Act is very significant based on the role that the Western Area Rural District Council (WARD-C) as a key stakeholder will play in the Project. The Act provides for the establishment of localities and local authorities; provides for the functioning of local authorities; defines functions and powers of local councils and councillors; and establishes the Local Government Service Commission, the Local Government Finance Committee, and the Inter-Ministerial Committee on decentralization. The statutory laws recognize private freehold land in Freetown and the Western Area (previously a British colony). In contrast, land in the three additional provinces (previously a British protectorate) is governed by customary law, with chiefs serving as custodians. Under this regime, land may be classified as state land, private land, or communal land. Land tenure arrangements for the Project are likely to combine all three land tenure types.

3.1.6 Sierra Leone National Land Policy 2015

The 2015 National Land Policy also provides for compulsory land acquisition in the public interest. The principles of the land policy include the principle of land as a common national or communal property resource held in trust for the people and which must be used in the long-term interest of the people of Sierra Leone. Such a principle only holds where it does not violate existing private ownership rights. Compensation to be paid for lands acquired through compulsory government acquisition will be fair and adequate and will be determined, among other things, through negotiations that consider government investment in the area. Local Authorities (City and District Councils) may negotiate for land for project development purposes, but all such grants should be properly documented and processed.

No interest in or right over any land belonging to an individual or family can be disposed of without consultation with the owner or occupier of the land. No interest in or right over any land belonging to an individual or family can be compulsorily acquired without payment, in a reasonable time, of fair and adequate compensation.

This Policy highlights Land distribution (acquisition and allocation), access to land by all Sierra Leoneans and investors, land tenure systems, land use planning and regulations, land management and administration systems, and land adjudication systems.

The following are policy statements in the National Land Policy:

- After the coming into force of this Policy, the sovereign title to Government/State lands and public lands shall vest in the National Lands Commission as follows:-
- As to Government/State lands in trust for the citizens of Sierra Leone as a whole; and

- As to public lands in trust for the citizens of Sierra Leone as a whole or in trust for the particular community that originally owned the land as prescribed by the statute or other law creating the same; and

- The sovereign title to private lands shall henceforth vest as follows:-

- As to land held under freehold tenure in the Western Area in the individual, group of individuals or Corporate entity absolutely;

- As to communal lands in the Provinces in the new Chiefdom Lands Committee (instead of the Chiefdom Council) in trust for the particular community concerned;

- As to family lands held under family tenure in the Province in the family as a unit;

- As to land held under Customary tenure in the Provinces in the Chiefdom Lands Committee/Village Area Lands Committee or the family which made the grant of usufructuary rights in perpetuity to the groups or individuals or corporate entity subject to the grantor's residuary rights.

According to the policy, the acquisition must be necessary to develop and utilize the property to promote the public benefit and other essential amenities.

Relevance to the Resettlement Plan: Under Sierra Leone law, compensation is usually made in cash for the actual value of the land and damages to property sustained because of the appropriation. According to Cap 116 and Cap 119, factors to be considered in determining just compensation are:

- the market value of the land at the date of the publication of the warrant;
- damage sustained as a result of the severance of affected land from the remainder of the person's land;
- general damage;
- expenses involved if the person is forced to change his occupation or place of business;
- damage suffered by people having other rights over the land.

3.2 Resettlement Related Institutional Framework

The institutional responsibilities related to land acquisition and resettlement in Sierra Leone as applicable under the Project of the extension of power distribution system in the Freetown Peninsula are summarized in *Table 5* below.

Table 5: Institutional Responsibilities related to land acquisition and resettlement

Institution	Responsibility
The Ministry of Energy	<ul style="list-style-type: none"> • Provides general Project oversight • Shall ensure that funds for the timely implementation of the RAP/ARAP are available • Minister can expropriate land for energy-related projects
The Ministry of Finance	<ul style="list-style-type: none"> • Relates with the central Bank to pay PAPs
EDSA	<ul style="list-style-type: none"> • Primary responsibility for ARAP implementation • Superintends the grievance redress process • Reviews and approve compensation rates • Present compensation rates to PAPs for signing off • Reviews reports on the completion of compensation payments • Responsible for ARAP Implementation • Assign safeguards personnel to contractors • Ensure that Project implementation complies with JICA Guidelines and World Bank's safeguards • Report to JICA on all aspects of environmental and social management and monitoring based on the results of ARAP monitoring and take corrective measures where necessary
The Ministry of Lands Housing and Country Planning	<ul style="list-style-type: none"> • Manages state land • Compulsory land acquisition for development projects • Prepare survey plans for EDSA in the event there is land acquisition • Verify survey/title claims • Participate in stakeholder consultations • Validation of property valuation
The Sierra Leone Roads Authority	<ul style="list-style-type: none"> • Manages RoW • Verify claims on RoW

	<ul style="list-style-type: none"> Support demolition of structures on RoW
Western Area Rural District Council	<ul style="list-style-type: none"> Valuation for land compensation Involve in Project grievance redress process
Local authorities (Paramount Chiefs, Town Chiefs, opinion leaders, and councillors)	<ul style="list-style-type: none"> Responsible for local policy matters; Resolving local conflicts; Provide orderly leadership at the local level
The Ministry of Agriculture and Forestry	<ul style="list-style-type: none"> Determines rates for crop compensation
Law Officers' Department	<ul style="list-style-type: none"> Draft compensation agreements Guide grievance resolution Participate in compensation sign-off meetings
Sierra Leone Police	<ul style="list-style-type: none"> Provides security during the demolition of structures

3.3 JICA Guidelines for Environmental and Social Considerations 2010

According to the JICA Guidelines for Environmental and Social Considerations 2010, projects should not deviate significantly from the World Bank's Safeguard Policies which the document referred to as the benchmark standards for international financial organizations. Therefore, the World Bank safeguard policy, which has now been changed or updated to World Bank Environmental Social Standards, will be considered to be substituted for the World Bank's Operational Policies.

For the JICA Guidelines, projects that result in large-scale involuntary resettlement required a Resettlement Action Plan (RAP) to be submitted. The following are outlines for involuntary resettlement in the JICA Guidelines:

- Involuntary resettlement and loss of livelihood are to be avoided when feasible by exploring all viable alternatives. After such an examination, avoidance is proved unfeasible, effective measures to minimize impact and compensate for losses must be agreed upon with the people who will be affected.

- People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported by project proponents etc. on time. Prior compensation must be provided as much as possible at full replacement cost. Project proponents must enable people affected by projects to improve their standard of living, income opportunities, and production levels, or at least restore these to pre-project levels. Measures to achieve this may include: Providing land and monetary compensation for losses (to cover land and property losses), Supporting means for an alternative sustainable livelihood, and Providing the expenses necessary for the relocation and re-establishment of communities at resettlement sites.
- Appropriate participation by affected people and their communities must be promoted in the planning, implementation, and monitoring of resettlement action plans and measures to prevent the loss of their means of livelihood. In addition, appropriate and accessible grievance mechanisms must be established for the affected people and their communities.
- For projects that will result in large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public. In preparing a RAP, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. When talks are held, explanations must be given in a form, manner, and language that are understandable to the affected people. The RAP should include elements laid out in the ESS5.

3.4 World Bank Environmental and Social Standard 5 (ESS5)

World Bank's Environmental and Social Standard 5 (ESS5) replaces the World Bank safeguard policy, OP 4.12, which forms part of the 2016 World Bank Environmental and Social Framework. The ESS5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons. Project-related land acquisition may cause physical displacement (relocation, loss of residential land, or loss of shelter), economic displacement (loss of land, assets, or access to assets leading to loss of income sources or other means of livelihood) or both.

ESS 5 applies to a bank-funded project when the displacement is caused or any loss of land or other assets resulting in:

- relocation or loss of shelter;
- loss of assets or access to assets; or
- loss of income sources or means of livelihood, whether or not the affected people must move to another location.

ESS 5 applies to all components of a bank-funded project that result in involuntary resettlement, regardless of the source of financing. It also applies to other activities resulting in involuntary resettlement that in the judgement of the Bank are:

- i. directly and significantly related to the Bank-assisted Project;
- ii. necessary to achieve its objectives as outlined in the project documents; and
- iii. carried out, or planned to be carried out, contemporaneously with the Project.

ESS5 provides guidelines to project proponents on land acquisition, restrictions on land use, and involuntary resettlement. ESS5 will apply where involuntary resettlement, impacts on livelihoods and assets, acquisition of land, or restrictions to natural resources may occur due to the Project. The requirements of ESS 5 includes:

- Involuntary resettlement is avoided or, when unavoidable, minimize involuntary resettlement by exploring project design alternatives;
- The Project avoids forced eviction;
- To mitigate unavoidable adverse social and economic impacts from the land acquisition or restrictions on land use by:
 - Providing timely compensation for loss of assets at replacement cost, and
 - Assisting displaced persons in their efforts to improve, or at least restore their livelihoods and living standards in real terms, to pre-displacement levels or to levels prevailing before the beginning of project implementation, whichever is higher.
- To improve living conditions of poor vulnerable persons who are physically displaced by providing adequate housing access to services and facilities, and security of tenure.
- To conceive and execute resettlement activities as sustainable development programs, providing sufficient investment resources to enable displaced persons to benefit directly from the Project, as the nature of the Project may warrant.
- To ensure that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation, and the informed participation of those affected.

Also, ESS 5 provides eligibility criteria and it states that affected persons may be classified as persons:

- Who have formal legal rights to land or assets;
- Who do not have formal legal rights to land or assets, but have a claim to land or assets that is recognized or recognizable under national law; or

- Who have no recognizable legal right or claim to the land or assets they occupy or use.

ESS5 also addresses issues of grievances that may emerge as a result of the implementation of certain project activities. Firstly, the proponent must ensure that a grievance mechanism is in place as early as possible in the project development phase to address specific concerns about compensation, relocation, or livelihood restoration measures raised by displaced persons (or others) in a timely fashion. Where possible, such a grievance mechanism will utilize existing formal or informal grievance mechanisms suitable for project purposes, supplemented as needed with project-specific arrangements designed to resolve disputes impartially.

3.4.1 Comparison of Sierra Leonean Regulations, JICA Guidelines and World Bank's ESS5

This section assesses the gaps and discrepancies between Sierra Leonean regulations, the JICA Guidelines and the World Bank ESS5. Where there is a discrepancy between national policy and the World Bank policies, under this Project, the JICA Guidelines and the Bank's requirement will take precedence as part of the gap-filling measures in the implementation of the RF summarized in *Table 6*

Common Principles

Generally, both the donors and the policy of GoSL support the following basic principles:

- Involuntary resettlement shall be avoided or minimized to the extent possible by incorporating social consideration into design options and alignment selections.
- Where displacement is unavoidable, i.e. people losing assets, livelihood, and other resources, shall be assisted in improving or at a minimum regaining their former status of living at no cost to themselves.

Table 6: Comparison of the Laws of Sierra Leone and World Bank ESS 5 concerning land acquisition, restrictions on land use, and involuntary resettlement.

Category	The Laws of Sierra Leone	World Bank ESS5	JICA Guidelines	Gaps filling measures under the Project
Landowners	Cash compensation based upon market value under the statute. Land for land under Customary Law	Recommends land for-land compensation of equal productive use or potential, located in the vicinity of the affected land or new sites of similar or better value plus transaction costs such as registration, transfer taxes or customary fees. Or compensation is the Market value of the equivalent area and use, with similar or improved infrastructure and services, located in the vicinity of the affected land plus all transaction costs.	Land and monetary compensation for losses (to cover land and property losses)	JICA Guidelines and ESS5 will be followed
Land Tenants	Entitled to compensation based upon land under the statute	PAPs are entitled to resettlement assistance in lieu of compensation for land, to help improve or at least restore their livelihoods.	Supporting means for an alternative sustainable livelihood and providing the expenses necessary for the relocation and re-	JICA Guidelines and ESS5 will be followed - Land tenants receive compensation irrespective

Land Users; Farmers; Gardeners	Entitled to compensation for crops and all other forms of improvements made to the land. Land for land under customary.	Entitled to compensation for crops, may be entitled to replacement land and livelihood must be restored to pre-project levels at least.	Provide the expenses necessary	of the legal recognition of their occupancy and any other livelihood restoration measure that will be agreed upon.
Owners of Non-Permanent Buildings	Cash compensation based on market value under the statute.	Entitled to in-kind compensation or cash compensation at full replacement cost including movement allowance, livelihood assistance for income loss, etc.	Land and monetary compensation for losses (to cover land and property losses)	JICA Guidelines and ESS5 will be followed
Owners of Permanent Buildings	Cash compensation based on market value.	Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, before displacement.	Land and monetary compensation for losses (to cover land and property losses)	JICA Guidelines and ESS5 will be followed

Crops	Cash compensation based upon rates calculated as the one-year net agricultural income.	Market value for lost crops.	Provide the expenses necessary	JICA Guidelines and ESS5 will be followed - the RAP Implementation Committee (RIC) set up to handle crop compensation matters shall mediate between the parties for the farmer to accept cash compensation as per market value.
Timing of compensation payment	Prompt	Prior to displacement	At resettlement sites.	Compensation payments must be paid prior to displacement.
Calculation of compensation	Fair and adequate.	Full replacement cost	Full replacement cost	The Full Replacement Cost Approach will be adopted for the calculation of compensation. No depreciation will be considered. Full replacement cost will include labour, relocation expenses and administrative costs of legalization

Squatters	No provision for PAPs with no claim whatsoever to land. Are deemed not to be eligible and therefore not entitled to any compensation	Are to be provided resettlement assistance and compensation for lost or damaged structures, and trees or crops they planted (but no compensation for land itself)	Expense necessary for relocation.	Squatters are to be provided resettlement assistance and compensations for crops, trees and structures (but no compensation for land)
Grievances	Formal and informal mechanisms and formal access to court of law	Functional, effective, transparent and accessible grievance redress mechanisms to be established	Appropriate and accessible grievance redress mechanisms must be established for the affected people and their communities	Functional, effective, transparent and accessible grievance redress mechanisms to be established
Consultation and information disclosure	The owner/occupier of the land must be formally notified at least a week in advance of the intent to enter, and be given at least 24 hours' notice before actual entry	Displaced persons and their communities are provided timely and relevant information, consulted on resettlement options, and offered opportunities to participate in planning, implementing, and monitoring resettlement.	Consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people	JICA Guidelines and ESS5 will be followed.

SECTION 4: PRINCIPLES AND OBJECTIVES GOVERNING RESETTLEMENT PREPARATION AND IMPLEMENTATION

From the legal and policy frameworks discussed in Section 3, the resettlement/livelihood principles adopted for the Project of extension of power distribution system will provide compensation at replacement cost, resettlement and rehabilitation assistance to all Project affected persons (loss of space for business and other such immovable properties, and crops), including the informal dwellers/squatters in the Project corridor footprint. The basic resettlement principles and guidelines include:

- i) Involuntary resettlement would be avoided where possible and where population displacement is unavoidable, it should be minimized by exploring all viable project options.
- ii) Persons affected by land acquisition and face relocation or loss of incomes associated with a change in land use due to the Project would be given prompt and adequate compensation that reflect current market realities so that they can improve or at least maintain their former standard of living.
- iii) The compensation cost and/or benefit estimation will be based on the Full Replacement method so that the cost of land and other properties taken and demolished are accounted for. This will ensure that the Project-affected persons' living standards are maintained or improved above the pre-displacement level.
- iv) Resettlement/rehabilitation of affected persons where needed (preparation of resettlement plan). Make provision for multiple options for resettlement (self-relocation or assisted relocation) of the affected residential structures, including informal dwellers/squatters.
- v) Consult affected persons meaningfully and provide opportunities to plan and implement resettlement programs. Inform affected persons about their rights/options pertaining to land acquisition/resettlement.
- vi) Project Affected Persons would be given full information on the qualification (eligibility), mode of compensation, the restoration plan of

- vii) production income, and the Project's progress and be involved in the enforcement of resettlement arrangements (community participation). Compensation and rehabilitation assistance will be paid before displacement. The land and/or property affected would be taken only when the PAPs are satisfied with the compensation arrangements. No civil works will be initiated unless compensation for land and assets and rehabilitation assistance is provided to all eligible PAPs.
- viii) An appropriate grievance redress mechanism will be established at multiple levels to ensure speedy resolution of disputes if any. The following principles will be followed:
 - Simplicity: procedures in filing complaints are understandable to users and easy to recall;
 - Accessibility: filing complaints is easy through means that are commonly used by stakeholders, especially by the Project-affected people;
 - Transparency: information about the system is made widely available to all stakeholders and the general public;
 - Timeliness: grievances are attended to and resolved in a timely manner;
 - Fairness: feedback or complaints are validated thoroughly and subjects of complaints are given due process and opportunities for appeal;
 - Confidentiality: the identity of complainants remains confidential;
 - Provide multiple uptake points to build trust and confidence in the GRM. Complainants will be provided with multiple channels to submit their complaints;
 - Develop a simple system (possibly electronic-based) for receiving, sorting, verifying, and tracking complaints for more effective management of grievances; and
 - Publicly disclose the complaints/grievance redress arrangements so that people are aware of where and how complaints will be managed.
- ix) All activities related to resettlement planning, implementation, and monitoring will ensure the involvement of vulnerable groups (including women and people living with disabilities). Incorporate special measures and assistance for vulnerable groups.

SECTION 5: RESETTLEMENT PLAN PREPARATION, REVIEW, AND APPROVAL PROCESS

In compliance with the JICA Guidelines and the World Bank ESS5, resettlement is prepared when people are physically or economically displaced from their land or other assets as a result of such development projects. This plan records baseline conditions of Project Affected Persons (PAPs) within the Project area, details potential impacts, holds adequate consultations with PAPs, and proposes a strategy to avoid or minimize impacts and compensate for unavoidable losses. When appropriately implemented, the resettlement plan should improve PAPs' living standards and livelihoods over and above their pre-displacement levels.

5.1 Project Screening

A screening process should be initiated to determine whether a development project of such nature will require a resettlement plan. The screening process should be able to identify the land/areas that will be affected. In all cases, the primary objective of screening will be to see whether land acquisition can be avoided by realignment or change in design.

The project screening was undertaken during the preparation of this RF. The result of the screening process suggests that the Project land take is very minimal and most of it is on the government RoW. No resettlement is expected. It is also anticipated that the Project will only cause economic displacement. Hence the ESS5 stipulates that a livelihood plan be prepared.

5.2 Resettlement/Livelihood Plan Preparation Process

The following procedure applies in preparing a resettlement/livelihood plan:

An independent consultant shall be hired to prepare the resettlement/livelihood plan. Detailed guidelines for preparing a resettlement/livelihood plan is available on the JICA website (www.jica.go.jp) and World Bank's website (www.worldbank.org) and in the World Bank's Resettlement and Rehabilitation Guidebook. Reference should be made to this RF in preparation of any resettlement/livelihood under this Project. A sample resettlement/livelihood plan outline is shown in *Annex ii*.

5.3 Resettlement/Livelihood Plan Approval and Disclosure

The resettlement/livelihood plan will be submitted to JICA for review in order to ensure compliance with the JICA Guidelines and the World Bank Safeguard policy OP 4.12 (now ESS5). JICA will provide clearance for the document. Once cleared by JICA, the document will be disclosed in-country and on the JICA external website. Through disclosure, the resettlement/livelihood plan shall be made available in publicly accessible areas such as community spaces in the Project area. The Project will communicate the availability of the document through the media, posters in the Project area, and relevant stakeholders such as market associations, chiefs, etc.

SECTION 6: ELIGIBILITY AND ENTITLEMENTS CRITERIA

6.1 Eligibility Criteria

According to the JICA Guidelines and the World Bank ESS5, the criteria for determining PAPs eligibility are as follows:

- Those who have formal legal rights to the land or assets they occupy or use;
- Those who do not have formal legal rights to the land or assets but have a claim to land that is recognized or recognizable under national law. Communal lands usually fall in this category;
- Those who have no recognizable legal right or claim to the land or assets they occupy or use. The squatters and encroachers will fall into this category.

However, all these categories should be or have their assets or interest in the Project area before the cut-off date is announced.

Any person who suffers a loss of, or damage to an asset or loss of access to productive resources or restricted access (temporarily), as a result of the carrying out of the Project for the extension of power distribution system, will be considered eligible for compensation and/or resettlement assistance provided the damage or loss is induced by the Project and satisfies the conditions of eligibility including the cut-off date.

The eligibility will be based on the category of losses at the cut-off date identified through the various interest and rights derived from common law and international conventions and in specific cases as agreed with the affected community. Eligible persons would include, but not be limited to, those listed in *Table 7*.

Table 7: Type of Loss and Eligible Persons

Type of Loss	Eligible persons
Loss of Land	Various interest and rights – allodial titleholder, usufruct, freeholder, leaseholder, tenant, licensees
Loss of Structure	Various interests and rights – freeholder, leaseholder, etc.
Business Losses Loss of business income	Business owner/operator

6.2 Defining Entitlements and Preparing the Entitlement Matrix

Table 8 presents the eligibility criteria and entitlement matrix for the general categories of impacts. The resettlement/livelihood plan for this Project will only consider impacts applicable to the Project.

Loss of business goodwill	Business owner/operator
Loss of rent income	Landlord/Lessor
Loss of wage income	Business employees/attendants
Loss of fees from trainees or apprentices	Trainer/Person offering apprenticeship job training
Loss of Business, Residential or Industrial Accommodation or Room	Residential/Commercial/Industrial Tenant Owner of a building during the reinstatement period
Loss of location for a temporary structure	Owner of a temporary structure
Loss of training or apprenticeship	Apprentice/Trainee
Loss of economic or perennial trees	Various rights and interest holders – farm owner, Sharecroppers, Licensees, Lessees
Loss of food crops	
Loss of grazing land	

6.1.1 Proof of Eligibility

EDSA or contractor undertaking the resettlement/livelihood plan will consider various forms of evidence as proof of eligibility to cover:

- i. Affected persons with formal legal rights, documents in the form of land title registration certificates, leasehold indentures, tenancy agreements, rent receipts, building and planning permits, business operating licenses, and utility bills. Unprocessed/unregistered formal legal documents will not bar eligibility and procedures for confirming the authenticity of such documents will be established in the resettlement plan.
- ii. Affected persons with no formal or recognized legal rights - Criteria for establishing non-formal, undocumented, or unrecognized claims to eligibility shall be established paying particular attention to each situation and its peculiarities. Alternative means of proof of eligibility will include:
 - An affidavit signed by landlords and tenants;
 - Witnessing or evidence by recognized traditional authority, customary heads, community elders, family heads and elders and the general community.

Table 8: Eligibility Criteria and Entitlements

Affected Assets	Type of impact	Entitled units	Eligibility criteria	Entitlement
Land	Permanent acquisition of land, i.e., leasing of land	Landowner (individual, family, community/stool)	Owns the affected plot of land under Sierra Leone laws, including customary laws, including customary	1. Land for land (of equivalent productivity, location advantages, and acceptable to PAPs) including transaction cost, transfer taxes, etc. or 2. Cash compensation as agreed among the parties via negotiation or prevailing market rates.
	Temporary occupation of land	Landowner (individual, family, community)	Owns the affected plot of land under Sierra Leone laws, including customary	1. Compensation (in cash or kind) for the period of occupation as agreed among the parties via negotiation.
	Renters	Renter (individual, family)	Rent land for farming, business or any livelihood activities etc	Are entitled to resettlement assistance in lieu of compensation for any improvement or undertaking on land, to help improve or at least restore their livelihoods
Crops (food/cash crops and	Destruction of/damage to standing crops	Owner or Farmer	Have grown the affected crop (regardless of related plot ownership)	1. Cash compensation for standing crops counted at the valuation date and based upon updated market rates, and

Affected Assets	Type of impact	Entitled units	Eligibility criteria	Entitlement
economic trees inclusive) Structures	Destruction of immovable structures	Owner - permanent	Owns affected structure	2. Disturbance allowance of 10% of (1)
				1. Compensation at full replacement cost (no depreciation) of structure, including the cost of registration, transfer taxes 2. right to salvage 3. Cost of moving (e.g. persons/ goods in the structure under or belonging to the owner) 4. Disturbance allowance of 10% of (1)
				1. Cost of renting a similar structure (e.g. for 6 months duration) 2. compensation for any non-movable asset at full replacement cost 3. Cost of moving out to a new place 4. Disturbance allowance of 10% of (1)
		Occupant - permanent	Live in or use the affected structure on a rental basis (Occupant different from owner)	1. Alternative route for ease of access
		Structure - temporal	Lives or use structure but may be restricted access due to Project operations	

Affected Assets	Type of impact	Entitled units	Eligibility criteria	Entitlement
Livelihoods	Relocation of movable structures	Owner	though the structure itself may not be affected Owns the affected structure	2. Disturbance allowance as negotiated with the PAP 1. Cost of moving affected structure to a new site 2. Disturbance allowance of 10% of (1)
		Occupant	Use or occupies the affected structure	1. Cost of moving occupants to a new site 2. Disturbance allowance of 10% of (1) [NB: if the owner is the same as the occupant, he/she will not be entitled to this disturbance allowance].
	Agriculture - the destruction of economic or cash crops	Farmer	Use affected land for farming as livelihood sources (emphasis on perennial crops. Annual crops can be harvested prior to land entry or destruction)	1. Cash compensation for any temporary loss of income or livelihood incurred as a result of the project during the transition period (period required to re-establish farm at a new location agreed upon).
Businesses	Businesses	Business person (may be distinct from owner of a	Operate a business on Project affected land, regardless of the land	1. Compensation of structures at full replacement value.

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Affected Assets	Type of impact	Entitled units	Eligibility criteria	Entitlement
Livelihoods	Use of communal resources	structure where business takes place)- permanent loss Business person (may be distinct from owner of a structure where business takes place)- temporal loss	ownership situation (includes squatters) Operate a business on Project affected land, regardless of the land ownership situation (includes squatters)	2. right to salvage materials 3. cost of moving to a new location 4. Disturbance allowance of 10% of (1) 1. Cash compensation of temporary loss of income and livelihood based on daily income and duration works before re-establishment of the business to pre-Project conditions.
		The user of such resources (can be individuals or communities)	Use communal resources as an element of livelihood	1. Assistance in identifying and accessing similar resources elsewhere 2. Cash compensation of temporary loss of income incurred because of the Project during the period required to access similar resources elsewhere/period required to provide alternative livelihood assistance

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SECTION 7: VALUATION PROCEDURES

7.1 The Process of Valuation Inspection/Referencing

Key points that the valuation will cover are as follows:

- i. Collection of all relevant primary and secondary data on the affected property during final detailed valuation inspection and referencing to serve as the basis for assessment of loss; and
- ii. A comprehensive primary database for monitoring, evaluation and audit.

Some relevant data to be captured by the valuer will be:

1. For Land
 - Capture location details of the land
 - Identify the boundaries of the area/section of the land to be affected.
 - Take detailed measurements of the land area to be affected along the affected boundaries.
2. For Buildings (Immovable Structures)
 - Photograph all affected immovable properties
 - Precise internal measurement of buildings should be done
 - Collate property details which will include noting affected accommodation details, constructional details of affected parts and external works (fence walls, gates, pavements), affected owner's details, etc.
3. For Temporary Structures (Movable Properties)
 - Collate data on temporary structures by categorizing temporary structures based on constructional details (wall materials, affixed to concrete slabs or not), size of the structure and use of structure (business/residential) and type of business.
4. Intangible Assets (loss/impact arising from disturbance)
 - Obtain relevant data on households affected (tenants, owners, relatives), apprentices/trainees and determine intangible loss on households, businesses and livelihoods.
5. For Crops
 - During the inspection and enumeration exercise, details such as type, age, stage of growth, size of farm (or the number of crops for isolated economic/perennial trees), nature of the farm, etc. should be captured.

Affected Assets	Type of impact	Entitled units	Eligibility criteria	Entitlement
Cultural heritage resource (e.g., sacred site).	Relocation of or removal of or access to cultural heritage resource located on project site	The owner (individual or community). Local traditional authority	Use or pay homage to cultural heritage resource/sacred site	Negotiate with traditional authority or community with regard to rites to be performed to ensure successful access to, relocation or removal of cultural resource/sacred site.

7.2 Identification and Categorization of Loss and Impact

PAPs should be identified by the types of losses they suffer or the project's impact on them. PAPs should not be limited to renters, tenants, farmers, and others who don't own their housing/field/etc. but will be displaced. The resettlement consultant will:

1. Ensure that identification and categorization of the likely loss or impact is undertaken during the planning and design stages of the project;
2. Establish the magnitude and coverage of impacts early in the project planning to justify adopting the resettlement instrument. A general categorization of losses will be done to reflect the extent of loss in terms of the following:-
 - Permanent or Temporary Loss;
 - Full or Partial Loss;
 - Minimal or Significant Loss.
3. Determine specific losses or impacts to reflect the exact nature of loss, whether visible and tangible or intangible and categorize into the following losses: -
 - Physical loss of assets which will be determined by assessing the interest or right to ownership, occupation and possession;
 - Loss of income, loss of livelihood and opportunities to employment; and
 - Impacts arising from disturbance/disruptions.

7.3 The Basis and Method of Valuation

The valuation basis would comply with the JICA Guidelines and the World Bank ESS5. Compensation will be assessed and granted at Full Replacement Cost. The methods for valuation for the various losses are presented in *Table 9*.

Table 9: Method of Valuation

Type of Loss	Method of Valuation	Basis
Loss of land	Land for land of equal productive use or potential, located in the vicinity of the affected land or new housing site plus the cost of preparation to levels similar to or better than those of the affected land, and transaction costs such as registration and transfer	Based on the market value of comparable recent land transactions

	taxes, or comparative sales method	Replacement cost method or comparative sales method (whichever gives a commensurate value)	Based on ongoing market rates. Crop rates will consider the stage of the crop and the number of years to maturity before such trees will begin to generate income, including the cost of labour and equipment invested in crop cultivation.
Loss of buildings (any type of structure, e.g., mud houses, wooden structures, sandcrete block houses, public buildings etc)	Replacement cost method or comparative sales method (whichever gives a commensurate value)	Based on ongoing market rates. Crop rates will consider the stage of the crop and the number of years to maturity before such trees will begin to generate income, including the cost of labour and equipment invested in crop cultivation.	Based on the average monthly net profit
Loss of trees, perennial crops, food/ cash crops	Comparative sales method/ replacement cost method	Based on the average monthly net profit	Based on the comparable rent passing, rent advance paid
Loss of business income and loss of business goodwill	Comparative method	Based on the comparable rent passing, rent advance paid	Based on the comparable rent passing, rent advance paid
Loss of income from rent and expenditure incurred for alternative accommodation during the reinstatement period	Comparative sales method	Based on the comparable rent passing, rent advance paid	Based on the comparable rent passing, rent advance paid
Expenditure incurred for transfer of chattels, movable properties and temporary structures	Comparative method	Based on truck/ transport hiring charges	Based on truck/ transport hiring charges
Loss of wages	Comparative method	Estimated income of the business or daily sales of the business; and	Estimated income of the business or daily sales of the business; and
Loss of fees from apprentice	Comparative method	Estimated period of construction which will disrupt business or commercial activity.	Estimated period of construction which will disrupt business or commercial activity.
Loss of Job training	Comparative method	Estimated period of construction which will disrupt business or commercial activity.	Estimated period of construction which will disrupt business or commercial activity.

Loss of access to natural resources	Access to similar resource elsewhere taking into consideration impacts at the alternative location. Cash compensation at replacement cost when it is demonstrated that there is no feasible alternative measures available.	Losses of income for businesses will be estimated from net monthly/annual profit of the business verified by an assessment of visible stocks and activities.
		Full replacement cost

7.4.2 Assistance to vulnerable persons

Assistance to vulnerable persons will be outlined in the resettlement/livelihood plan following the census and may take various forms depending on the circumstance of their vulnerability and needs. Assistance to vulnerable people may include but not limited to the following:

Similar to all PAPs, assistance in financial literacy training, especially for women and assistance in compensation payment procedures (e.g. going to the bank with them to cash the compensation cheque);

- Assistance in the post-payment period to secure the compensation money and reduce risks of misuse/robbery;
- Assistance in moving: providing vehicle, driver and assistance at the moving stage;
- Where compensation is determined in-kind payment, vulnerable persons should be paid in cash if they so desire;
- Access to Health insurance and assistance to medical facilities for critically ill PAPs.
- Moving and rent subsidy for the transition period.

7.4 Consideration for Vulnerable Groups

7.4.1 Identification of vulnerable groups

Vulnerable groups are those at risk due to the displacement, compensation, and resettlement process. There may also be some PAPs who are already vulnerable based on their existing conditions such as poor health, disability, old age, etc., project impact could worsen their condition. During the census, the project should identify such persons for the resettlement/livelihood plan. In preparing the resettlement/livelihood plan, the following categories of PAPs shall be given special considerations:

- The elderly, usually from 70 years and above;
- Widows, Women and children;
- Physically challenged persons;
- Mentally challenged/highly depressed persons;
- Affected Persons who are too ill, bedridden, hospitalized or stricken with HIV/AIDS;
- Unemployed youth;
- Female-headed households; and
- Migrant without proper land documents.

SECTION 8: PROCEDURE FOR DELIVERY OF ENTITLEMENT AND IMPLEMENTATION SCHEDULE

8.1 RAP Implementation Arrangement

EDSA has a functional implementation arrangement for RAP/ARAP implementations. The implementation arrangement mentioned below has been used for the Bo-Kenema project, the Energy Sector Utility Reform Project (ESURP), and the ESURP Additional Finance (ESURP-AF) implemented in Sierra Leone.

This arrangement can be adopted for the extension of power distribution system along the Freetown Peninsula.

8.1.1 Roles and Responsibilities

The Ministry of Energy will provide general Project oversight. Planning, management, and implementation of the resettlement/livelihood are the responsibility of the Environmental and Social safeguards Specialists at EDSA. For successful implementation of the Project, a RAP Implementation Committee (RAP-IC) will be established to support all activities of the implementation of the ARAP. The RAP-IC oversees the implementation of the resettlement/livelihood and shall work with the resettlement/livelihood implementation schedule. The implementation process will require that MoE and EDSA coordinate with several stakeholders. An Inter-Ministerial Sub-Committee (ISC) will be established to provide the necessary support to the Project's implementation.

- **The Inter-Ministerial Sub-Committee (ISC)**

The ISC shall support the RAP-IC access to necessary legal documentation such as building permits, house plans, etc. on properties within the RoW. This committee is comprised of officials from Statehouse, Ministries of Energy and Lands, Roads Authority, the Sierra Leone Police, EPA-SL, Ministry of Lands, Ministry of Works and Infrastructure, the Law Office Department, Ministry of Information and Communication, Office of National Security and a representative from the RAP-IC.

Structure of the Committee

The committee is structured as follows:

- A Chairperson - Director of SPU responsible for convening meetings; chairing and moderating meetings and also giving responsibilities to committee members
- A Coordination Committee - where other Ministries Departments and Agencies (MDAs) can be co-opted on a needs basis
- A Secretariat - the MoE will coordinate activities before, during and after committee meetings

Composition of the Committee

- Deputy Minister, Ministry of Energy
- Head, Road Infrastructure Monitoring and Protection Unit – SLRA
- WARDC
- Civil Engineer, Civil Engineering Department - Ministry of Works, Housing and Infrastructure
- Director, Disaster Management Unit - Office of National Security
- Director General – EDSA
- Senior Regional Officer – Environmental Protection Agency
- Sierra Leone Police
- Deputy Director, Surveys and Lands - Ministry of Lands, Housing and Country Planning
- Senior Information Officer - Ministry of Information and Communications
- Principal State Counsel, Law Officers' Department - Attorney General's Office
- Senior Director - Strategic and Policy Unit, State House
- Adviser to the President on Energy and Infrastructure - Strategic and Policy Unit, State House
- Chairman of Energy Committee – House of Parliament

Major Responsibilities

The Inter-Ministerial Sub-Committee (ISC)

- supports monitoring activities and enforce regulations to protect the RoW, with particular emphasis on congested communities
- facilitates the demolition of all affected structures as per defined Project guidelines for demolition
- ensures timely implementation of the RAP and related issues to the RoW

Expected Outputs

Specifically, the expanded inter-ministerial will have the following outputs:

- Access to necessary legal documentation such as building permits, house plans, etc. on properties within the RoW facilitated;

- All structures violating RoW clearances will be demolished, including: those identified as ineligible for compensation
 - PAPs that had received compensation and yet in occupancy in the RoW;
 - structures in the RoW that have been built after cut-off date;
 - temporary structures during rehabilitation works of the Contractor
- safeguards monitoring enhanced
- community sensitization as well as door-to-door sensitization on electric hazards associated with living under the RoW supported

Frequency of Meetings

Quarterly meetings will be held and where necessary extraordinary meetings will be organized. For resettlement/livelihood implementation, monthly meetings will be held.

The RAP-IC

The committee will assist in the validation of the PAPs, and in identifying affected persons for compensation. The contractor shall submit a construction work plan to the committee, which the supervising engineer of EDSA must endorse. This committee will meet regularly to review the work plan and discuss other matters. An adequately constituted structure for administration and implementation of the resettlement/livelihood plan is imperative and agreement must be reached from the onset with the committee members. The RAP-IC will need capacity building to successfully implement the resettlement/livelihood plan. This should be budgeted for.

Composition of the RAP-IC

The composition of the committee shall include the main stakeholders in the Project.

- EDSA (Facilitator/secretariat)
- EDSA Legal Representative
- MoE
- EDSA Planning Network Planning Department Representative
- EDSA Health and Safety Department Representative
- WARD C Chief Administrator, Community Councilors, council Engineer,
- Traditional Leaders/Chiefs of the respective Communities,
- Witness NGO
- A representative from the PAPs
- A representative from Disabled Organizations
- A representative from the Ministry of Lands, Housing and Country Planning
- A Representative from SLRA
- A Representative of Inter-religious Council (Pastor & Imam)

- A Representative of Traders Union

Structure

- Chairperson: responsible for convening meetings; chairing and moderating meetings and also give responsibilities to committee members
- A Coordination Committee - where other stakeholders can be co-opted on a needs basis
- Secretariat: The Facilitator/Secretariat, the EDSA, will be responsible for the following:
 - Coordinate, organise, and facilitate committee and PAP meetings, including preparation of an agreed standing agenda, presentations, and sending minutes to stakeholders;
 - Act as a key contact person for the ISC;
 - Co-ordination and liaison, including tracking and reviewing Project progress through regular meetings with respective committee members and committees;
 - Ongoing reporting and communication to the RAP-IC, and ISC, through a communication strategy, on the progress of committee related matters;
- Other responsibilities include but are not limited to:
 - Providing upfront planning, scheduling, and resourcing for the Project;
 - Reviewing the resettlement/livelihood preparation process, including the scope, budget, and schedule;

Frequency of Meetings

- Monthly meetings for the duration of the resettlement/livelihood planning and development phase will be held.
- All meetings will be accompanied by an agenda, minutes of the meeting, and action plan;
- Meeting invites will go out 2 weeks before the meeting to secure a suitable timeslot and a telephonic reminder will be done 2 days before the meeting;
- Meetings will take place at the most convenient and practical location for all members

8.2 Procedures for Delivery of Entitlements

The procedure for delivering of entitlements will be detailed in the resettlement/livelihood plan. EDSA shall follow approved procedures, ensuring that full payment of compensation is made before possession of acquired sites.

A database of PAPs prepared by the resettlement/livelihood plan consultant forms the basis for compensation. The database should include the name, telephone number, photo, description of the affected property, total compensation, etc. of PAPs. EDSA shall then hold consultations with PAPs to negotiate with PAPs to agree on the compensation package, highlight the time allowed to salvage properties, establish payment methods.

8.2.1 Payment of Compensation

The following shall be followed:

- i. The compensation rates and total budget should be verified and approved by EDSA
- i. Once EDSA approves the compensation rates and total budget, EDSA shall proceed to sign individual compensation agreements with PAPs
- ii. Payment of cash will be made via direct bank transfer to the PAPs bank account. EDSA shall open bank accounts for PAPs if they do not have one to pay in cash instead of giving them cheques.
- iii. Payments to PAPs should be made in the presence of the RAP-IC.
- iv. A local NGO should be hired to monitor the payment process.
- v. Every stage of the process will be photographed, and all PAPs will be thumb printed
- vi. Compensation shall be paid before displacement

8.3 Preparation of ARAP and Setting Up of Resettlement Management Teams

Table 10 shows typical steps to prepare ARAPs and set up resettlement teams.

Table 10: ARAP Preparation Steps and Setting up Resettlement Management Committees

Step	Detail	Responsibility	KPIs
Conduct census and socio-economic survey	Identification of PAPs including those who were not available during the course of the survey and resistant PAPs as well as the vulnerable.	EDSA/Consultant	Survey data (including pictures and full details of PAPs) stored in a database
Establish cut-off date	Survey of affected assets Determine the cut-off date and develop the cut-off date communication strategy and budget. Communicate the cut-off date as determined	EDSA/Consultant	Cut-off date implementation plan signed off
Preparation, review and publishing of the ARAP	Local publication at the MoE/EDSA website and local tabloids and also at JICA website	JICA/MOE / EDSA	ARAP published
Establish the RAP IC	Send out invitation letters and launch committee; ToRs for RAP IC	EDSA	Meeting minutes of RAP IC meetings
Validate ARAP	Approve eligibility criteria including the LRP for each PAP	EDSA/ RAP IC	PAP entitlements signed off
Develop Monitoring Plan	Recruit the services of an Independent Monitor; develop internal monitoring plan	JICA/EDSA	Monitoring plan signed off and completed
Recruit firm or provide for Livelihood Restoration Program	Draft ToRs; Evaluate CVs; Negotiations; Contract signing; develop and implement plan	JICA/EDSA	List of PAPs eligible for LRP
Notification of eligibility	Prepare notification letters of eligibility. Letter should request proof of ownership/tenancy	JICA/EDSA	Proof of delivery of notification letters to every PAP on eligibility matrix

PAP initial consultations	where applicable Informing community leadership; Preparing invitation letters; Developing meeting agenda (Project background, ARAP process, GRM, Cut-off date, title claims, ID cards); print posters, Selection of meeting locations, media and other arrangements and secure budget funds; Documentation (minutes, pics, recording)	JICA/EDSA	Initial meetings with PAPs undertaken
PAP negotiations	Invitation letters to negotiations meetings; Prepare negotiations sign-off sheets; Draft negotiations points (compensation amount, in-kind/cash compensation, time required to salvage, preferred option for demolition etc.); Negotiations meeting; Identify alternatives and include in compensation agreements	JICA/EDSA	Signed PAP negotiations form
PAP compensation	Draft compensation agreement forms; Confirm Powers of Attorney (PoAs) and claims; Outsource service of fund manager; Selection of meeting locations, media and other arrangements and secure	JICA/EDSA	Signed compensation agreements; signed cheques

	budget funds; Sign final agreements	JICA/EDSA	Demolition report
Demolition of affected structures	Source service provider; Prepare MoU or Contract as the case may be; Budget; Establish mutual expectations around workers health and safety procedures and community health and safety; demolish as per agreed timeline with PAPs	JICA/EDSA	Handing over notes/ photos
Hand over site to contractor		JICA/EDSA	Onsite checklist or forms
Supervision of construction works		JICA/EDSA	Number of grievances received
Grievance management	develop grievance registers; set up WhatsApp group;	JICA/EDSA	

SECTION 9: PROVISIONAL BUDGET

9.1 RF Implementation Budget

The estimated budget for the implementation of this RF is USD 10,500. The budget components include disclosure of RF, establishing a Grievance Redress Mechanism (GRM), training and capacity for all relevant entities, etc.

Table 11: Estimated Budget for RF

Activity	Description	Item	Unit cost (US\$)	No.	Total Cost US\$
Disclosure	Disclosure of RF	Media advertisement, the printing of documents, Local travel, community/stakeholder engagements etc.	NA	NA	5,000
GRM sensitization and Implementing	popularize the GRM among PAPs and the general public	Local travel, allowances, community engagements, stakeholder meetings, etc.	NA	NA	3,000
Capacity building of key stakeholders in Project implementation.	Training of Project and Project-related staff, Resettlement Committee etc.	Technical assistance/Resource persons (for training), training materials, hall rental, food and refreshment	NA	NA	2,500
Total Cost			NA	NA	\$10,500

9.2 Resettlement/Livelihood Plan Preparation Budget Estimation

An outline of the indicative costs for the preparation of resettlement/livelihood plan and implementation is indicated below and will be derived from expenditure relating to:

- (1) the preparation of the resettlement instrument,
- (2) relocation and transfer,
- (3) income losses and livelihood restoration plan, and
- (4) administrative costs.

Table 12: Indicative Outline of Resettlement/Livelihood Plan Budget

No.	ITEM Description	QTY	Unit Cost (USD)	Total Cost (USD)
1.0	PREPARATORY PHASE COST			
1.1	Preparation of resettlement plans or compensation reports			
1.2	<i>Subtotal 1 (Preparatory phase cost)</i>			
2.0	COMPENSATION COST			
2.1	Compensation for temporary occupation of land			
2.2	Compensation for the destruction of standing crops			
2.3	Compensation for the destruction of permanent immovable structures			
2.4	Compensation for temporary displacement of moveable structures			
2.5	<i>Subtotal 2 (Compensation cost)</i>			
3.0	LIVELIHOOD RESTORATION /MITIGATION MEASURES COST			
3.1	Compensation for PAPs loss of income			
3.2	Compensation for business person loss of income			

SECTION 10: GRIEVANCE REDRESS MECHANISM

10.1 Introduction

A systematic and functional Grievance Redress Mechanism (GRM) should be adopted to address the concerns of PAPs and other residents. Such a mechanism should detail the processes involved in registering grievances at no cost to the PAPs. In the context of this RE, a grievance could mean a simple query or inquiry, concern, issue, or formal complaint that bothers or disturbs the lives of PAPs. The levels of the GRM should be well publicised as a way of educating PAPs and other residents on the process. However, alternative means of access will be the public information centres that will be established at various Project communities. At the same time, information about where complaints can be lodged shall be incorporated into all compensation and/or livelihood restoration agreements. There is a wider public understanding and acceptance of the mechanisms proposed for grievance redress. Similar information will be published on public notice boards communicated verbally at all public meetings and outreach sessions.

10.2 Rationale for GRM

The primary purpose of the GRM is to hear the complaints or address the concerns of PAPs and related communities to a fair extent and on time. Dissatisfaction can cause an aggrieved PAP or resident to act beyond expectations, culminating in some unforeseen repercussions that would negatively affect Project implementation and stall Project progress. Consequently, the GRM proposed for this Project seeks to achieve the following objectives:

- Encourage registration, acknowledgement, and recording of all concerns or issues raised by the PAPs or stakeholders;
- Identify the frequencies of issues raised: for instance, unpaid compensation, inadequate compensation, disregard for local ritual ceremonies, land acquisition and many more;
- Ensure that complaints are appropriately registered, tracked and documented, with due regard for confidentiality;
- Address the composition of a committee that would handle all grievances;
- Inform people of the public information centre establishment and access;
- Establish procedures for the GRM to enhance easy access, transparency and accountability, and tackle escalation of grievances beyond expectations;

3.3	Cost of special assistance to vulnerable groups			
3.4	<i>Subtotal 3 (Livelihood restoration/mitigation cost)</i>			
4.0	CAPACITY BUILDING & IMPLEMENTATION COST			
4.1	Capacity building for key stakeholders			
4.2	Disclosure of resettlement instrument			
4.3	Logistical support and engagement of Safeguard Officer (s)			
4.4	Cost for grievance redress/monitoring & evaluation activities			
4.5	Cost for compensation disbursement			
4.6	Legal fees (in case of court dispute)			
4.7	Cost for Resettlement/livelihood Completion Audit			
4.8	<i>Subtotal 4 (Capacity building & implementation cost)</i>			
5.0	TOTAL COST (addition of all subtotals 1-4)			
6.0	CONTINGENCY (5%-10% OF TOTAL COST)			
7.0	GRAND TOTAL COST (Total Cost + Contingency)			

- Manage the concerns raised by PAPs to achieve a win-win situation within a reasonable timeframe that would comply with national and international best practices; and
- Record all resolutions agreed upon by all parties involved and ensure that aggrieved persons are satisfied with every outcome of remedial resolution to foster harmony in the Project's implementation.

10.3 GRM Institutional Framework

A functional Grievance Redress Mechanism (GRM) exists within EDSA for the ESURP and ESURP-AF Projects. Residents within the Project area (Western Area) are very convenient with its procedures. Therefore, it is advisable to adopt the same structure for this Project.

This GRM is very systematic and functional to address the concerns of PAPs. Such a mechanism details the processes involved in registering grievances at no cost to the PAPs. The levels/tiers of the GRM shall be well publicised to educate PAPs and other residents on the process. However, alternative means of access will be the public information centres that will be established at the councillor's office. At the same time, information about where complaints can be lodged shall be incorporated into all compensation and or livelihood restoration agreements so that there is a wider public understanding and acceptance of the mechanisms proposed for grievance redress. Similar information should be published on public notice boards communicated verbally at all public meetings and outreach sessions.

The grievance redress process shall follow the following principles:

- **Simplicity:** procedures in filing complaints are understandable to users and easy to recall;
- **Accessibility:** filing complaints is easy through means that are commonly used by stakeholders, especially by the PAPs;
- **Transparency:** information about the system is made widely available to all stakeholders and the general public;
- **Timeliness:** grievances are attended to and resolved on time;
- **Fairness:** feedback or complaints are validated thoroughly and subjects of complaints are given due process and opportunities for appeal;
- **Confidentiality:** the identity of complainants remains confidential;
- **Provide multiple uptake points to build trust and confidence in the GRM.** Complainants will be provided with multiple channels to submit their complaints;

- Develop a simple system (possibly electronic-based) for receiving, sorting, verifying, and tracking complaints about more effective management of grievances; and
- Publicly disclose the complaints/grievance redress arrangements so that people are aware of where and how complaints will be managed.

10.3.1 Grievance Procedure

A Grievance Redress Committee (GRC) shall be established and composed of MoE, EDSA, ward councillors, traditional chiefs, and ward committees before the commencement of construction site works and the Engineering, Procurement and Construction (EPC) contractors shall be briefed of the GRM system. The GRC will be headed by a grievance redress officer at the EDSA and steps will be taken to ensure that all grievances are appropriately documented and updated in a database for tracking of resolution.

The GRC members may require some capacity in managing grievances. Therefore, a budget will be allocated for training and sitting allowances for the GRC members.

Overall, the grievances management steps will include the following:

- Lodge complaints through a phone call, text message, WhatsApp, in-person directly to community influencers, the grievance redress officer at the EDSA or the appeals committee all at the Project level.
- Acknowledgement and registration of complaints within 2 days
- The investigation, verification, and determination of resolution options. Complaints shall be acted upon within fourteen (14) working days;
- Provision of feedback to the stakeholder regarding resolution and progress towards resolution and complainant satisfaction within 2 days of receipt of resolution outcome
- Final resolution -tracking and documenting actions and outcomes in the database and with the stakeholder;
- Where a PAP is fully satisfied with the resolution process, the matter will be formally closed.

If the complainant is not satisfied with the mediation at the community and EDSA levels, a referral to an appeals committee is required at all the Project levels. While the Project will undertake reasonable efforts to resolve all grievances within the Project structures, complainants will still have the right to resort to the court of law to get a final settlement where the resolution offered by the Project is not accepted.

EDSA should maintain all records of grievances in a database. The scope of reporting should include:

- Quarterly reporting of grievance mechanism data
- The types of complaints received, response times, offers of the resolution, and acceptance and complaints resolved vs. appealed
- Whether the Project worked to improve processes to eliminate the issue causing a repeated concern
- Track any unresolved or illegitimate complaints where a resolution was offered but not accepted.
- Timeframe to analyze the effectiveness of the GRM and make changes as appropriate

10.3.2 Levels of Grievance Resolution

Tier 1. Ward councillors and other community influencers shall be the first level to resolve grievances. Councillors, chiefs, headmen, and other community stakeholders are known community structures for dispute resolution who reside in their local communities to be engaged by PAPs more easily. PAPs prefer this easy access and familiar means to settle disputes in their communities. However, to ensure effective grievance management at this level, the councillors should be trained on the resettlement/livelihood processes (*Figure 2*).

Tier 2. When grievances are not resolved at tier 1, PAPs can file a complaint to any person at tier 2. Also, PAPs can directly report a grievance to tier 2. A PAP shall file grievances using a complaint form (*Annex iii*) for sample form). All complaints received in writing (or written when presented verbally) and processed through the stages identified in the GRM, will be recorded in a register or log sheet by the Environmentalist at EDSA and updated in a database. The register presents the date of the complaint, the name of the complainant, the community she/he is from, a description of the complaint, and the actions taken to address the grievance (which shall also note the status of the grievance).

Acknowledgment of receipt of grievance reports should be within seven working days. Outcomes from the decision should be provided within fourteen (14) working days of receiving the complaints, which should be communicated to the PAP. Once a grievance or complaint has been resolved or being escalated, the officer responsible shall complete a Grievance/Complaint Resolution/Escalation Form (see *Annex iii* for sample form) to close out the complaint or record the reason for escalation, and the officer and the complainant shall sign the form (if she/he so desires), with a witness.

However, where no amicable resolution is reached with the PAP or the PAP does not receive a response from the stakeholders in tier 2, the PAP can appeal to the GRC, which should look at the complaint within fourteen (14) working days.

Tier 3: The court of law will serve as the last resort for all types of grievances. According to grievance redress procedures, PAPs should be exempted from all administrative and legal fees. However, the decision to use the court as a redress mechanism should be left to the discretion of a PAP.

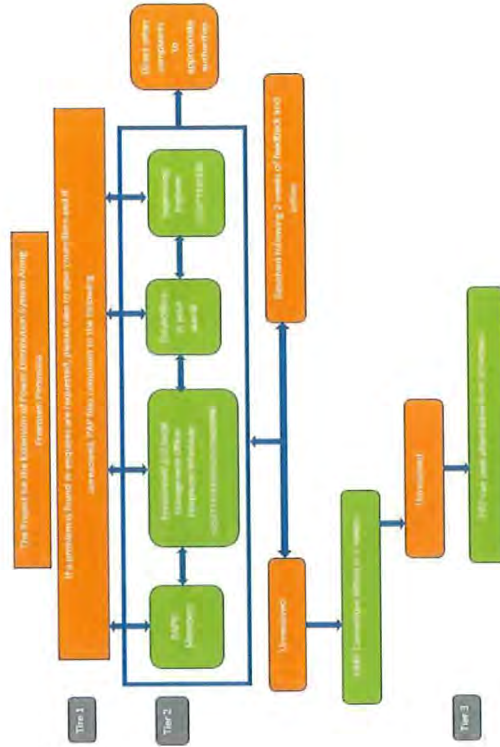


Figure 2: GRM Structure

10.3.3 Key Community Influencers

The following stakeholders are very influential in their respective communities (*Table 13*). Therefore, the Project should find ways to incorporate them into the GRC.

Table 13: List of Key Community Influencers

Name	Community	Designation	Contact
Julick Prat	York	Headman	
Daniella Grace Dove	Mama Beach	Deputy Headman	

Prince Williams	Mama Beach	Headman
Lamin Koroma	No 2	Youth Leader
Joseph Jalloh	No. 2	Headman
Thomas Squire	Black Johnson	D.Youth Leader
Edward K Samuel	Black Johnson	Headman
Ibrahim Marrah	John Obey	PRO
Hassan Marrah	John Obey	Headman
Samuel Mansah	Kent	Headman
	Kerry Town	Ward
		Development Committee chairman
Santigie Kamara	Kerry Town	Deputy Secretary
Mohamed Medino Sankoh	Boyor	Headman
Alie Kabia	Boyor	Youth Leader
Mohamed Sidie Kamara	Tombo	IN-Charge Committee
Mr. Alie Kamara	Tombo	Youth Chairman
Alpha Koroma	Tombo	Land Owner
Abubakarr Tejan Conteh	Tombo	Community Deputy Chairman
Amadu Bangura	Tombo	Western Area
Chief Michael K Bengheh	Tombo	Sherbro Chief
Nusukuta O Baratay	Tombo	CHO
Sarah Bah	Tombo	Headman
Isaac T Koroma	Tombo	Headman (Kassie)
	Tombo	Land Owner (secondary substation)
Mohamed Kamara	Mile 13	Headman
Ibrahim Kamara	Mile 13	Chairlady
Mariama Bintu Caulker	Bawbaw	Headman
Alex Issa Bangura	Bawbaw	Secretary-General
Pst. James Macauley	Ogoo Farm	Headman
Abdulai S Kamara	Ogoo Farm	Deputy Headman
Ashimie Cole	Lakka	Headman
Foday Tucker	Lakka	Deputy Headman
Alhaji A Dumbuya	Lakka	chairlady
Aminata Shillon	Lakka	youth leader
Mondeh Kargbo	Lakka	Chief
Foday Kamara	Lakka	

Sheku Fornah	Funkia	Headman
Foday Sankoh	Funkia	Deputy Headman
Tommy Sawyer	Sussex	Headman
Denis Clay	Sussex	Deputy Headman
	PWD	
Ibrahim Macauley	compound/Bridget	Headman
	PWD	
Kallah Adnan	compound/Bridget	Deputy Headman
Samuel Gorden	Russet	Headman
James Macfoy	During Town	Chairman
Christiana Macfoy	During Town	Deputy Headman

SECTION 11: STAKEHOLDER CONSULTATION AND INFORMATION DISCLOSURE PROCESS

11.1 Objectives of Stakeholder Engagement and Information Disclosure

The ESS10 provides the following objectives of the Stakeholder Engagement and Information Disclosure process:

- To establish a systematic approach to stakeholder engagement that will help borrowers identify stakeholders, build and maintain a constructive relationship with them, in particular, Project-affected parties;
- To assess the level of stakeholder interest and support for the Project and to enable stakeholders' views to be taken into account in Project design and environmental and social performance;
- To promote and provide means for effective and inclusive engagement with Project-affected parties throughout the Project life cycle on issues that could potentially affect them;
- To ensure that appropriate Project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible, and fair manner and format;
- To provide Project-affected parties with accessible and inclusive means to raise issues and grievances and allow borrowers to respond to and manage such grievances.

11.2 Stakeholder Engagement and Participation Strategy

The key elements of the stakeholder engagement and information disclosure strategy for the Project for the extension of power distribution system operations will include the following:

- i. disclosure of important Project related information by the implementing agencies on its website and at the appropriate local level and other disclosure procedures agreed with JICA;
- ii. a framework for consultation with the key stakeholders including the affected communities, important local leaders and energy user groups (e.g., local

business associations) during planning, design and implementation of the Project;

- iii. ensuring free, prior, informed consultation with the affected communities and key energy user groups and their representatives for obtaining broad community support;
- iv. the establishment of a GRM at the national and Project site levels (to be managed by EDSA in concert with WARDC) to meet specific grievance redress requirements of operations/Project.

11.3 Consultations Strategy and Participation Framework

To ensure people's participation in the planning phase and to promote public understanding of Project scope, activities, and impacts, various sections of Project affected persons and other stakeholders shall be engaged in various consultations throughout Project planning and implementation.

Public participation, consultation and information disclosure in the Project for the extension of power distribution system operations should begin with initial social assessment activities during the initial phases of Project preparation. Public consultation activities and information disclosure to PAPs and local authorities will continue as the Project preparation activities proceeds.

Mechanisms for community entry, consultation and participation of PAPs will be addressed in the resettlement/livelihood plan for the Project and shall be defined by cultural prescriptions, which will be carefully studied and adhered to in each affected community. The mechanisms will include public meetings, participation in site preparation, resettlement committees for PAPs and communities and interagency committees for participating stakeholders.

- a) **Public meetings:** Meetings with Community leaders, opinion leaders, utility agencies, district councillors and PAPs as individuals (during the surveys) and in their groups shall be arranged. At the meetings with the PAPs, the resettlement team shall explain the various resettlement options so that PAPs can choose what they want, for instance, cash compensations, alternative land or building, or group resettlement as they apply. As feasible, resettlement options will be designed within mind social networks and community institutions so that they are not disintegrated and appropriate for Projects affecting whole settlements or sites. Usually, electric energy Projects such as installing distribution lines, constructing substations, etc., often involve linear resettlement.

PAPs will also be informed about the resettlement process and each affected person shall be given a chance to express their concerns on a draft resettlement/compensation plan.

- b) **Involvement in site preparation:** Participation should also be fostered through local know-how and materials. The EPC contractor will be encouraged to use local people to supply materials and goods needed for implementation.
- c) **Group formation:** Using existing groups or assisting PAPs to form groups provides an institutional framework for participatory resettlement/compensation planning.
- d) **Involvement in resettlement committees and monitoring teams:** participation in committees would be one of the key mechanisms for involvement of PAPs in the planning, implementation, and monitoring of the resettlement/livelihood plan.

This framework shall be a subset of the overall communication strategy of the Project for the extension of power distribution system operations. Some potential communication methods will include information boards, pamphlets, wall paintings, gong-gong beating, organizing meetings with key informants and village committees and opinion gathering through phones and SMSs. To facilitate this, the Project for the extension of power distribution system will prepare and disclose Public Consultation and Communication Plans as part of the Project preparation process. A percentage of the Project cost shall be allocated to design and implement the communication strategy.

Details of all public meetings held with people and local government officials shall be documented with dates, locations and the information provided and the major emerging issues. It is recommended that the Resettlement/livelihood plan and other documents include this list, as an attachment. Where public announcements are made, the details, together with a copy of the text of the announcements, should be provided in the documents.

11.4 Stakeholder Engagement during Preparation of Resettlement Framework

Consultation during this framework preparation was done openly and transparently (*Figure 3*). Stakeholders were given notice of the consultation with a Project summary document shared by email or WhatsApp (as convenient for the stakeholders). The stakeholders include the police, local council, traditional leaders, residents, traders

along the RoW. A printed copy of the Project document was also shared during the consultations among stakeholders who could not access it via the internet or social media. The content of the summarized Project document was read out to stakeholders in Krio.

11.4.1 Stakeholder Identification and Analysis

For this framework, stakeholders comprised MDAs at national and district levels, district councils, traditional authorities, women's groups, youth groups, and other residents.

During the stakeholder engagement process, the framework consultants adhered to the following principles:

- As Project-affected communities were engaged, the main focus was building trust, mutual respect, and understanding to achieve better Project outcomes. This provided a valuable opportunity to influence public perception and set a positive tone with stakeholders at this stage moving forward.
- Overall, stakeholder engagements were very productive and have built a relationship that shall serve as "capital" during the Project life span.
- The engagements also helped establish a long-term relationship with stakeholders, drawing attention to bigger pictures and minor issues so that we don't jeopardize the broader social license for the Project to operate in the Project communities.

- Community Chairmen
- Headmen
- Mamie Queens
- Youth Leaders

Invitation Procedure

Stakeholders identified for this Project were informed about the meeting through either formal letters, SMS text messages, or calls. Brief information on the Project, the Project objectives, benefits, and adverse impacts were attached to the letter. Contact information (email address and phone numbers) were provided

Places and Date of meetings

The meeting date and venue were agreed on in consultation with stakeholders. These stakeholders were very cooperative in providing the venue for these meetings. Consultation meetings were held at different locations and at different times (

Table 14)

Table 14: Consultations Held

Date	Place	Participants	Number of participants	Contents
17th December 2021	Funkia	Community leaders and community residents	23	To inform and enlighten on; Project objectives, Project components, the scope of the Project, likely significant benefits of the Project, and the purpose and relevance of the consultation.
17th December 2021	Ogoo Farm	Community leaders	8	To capture and comprehend; residents' perception of the Project, potential benefits, and impacts of the Project, and suggestions on measures to lessen probable negative impacts.
17th December 2021	Lakka	Community leaders	5	
8th January 2022	Mile 13	Community leaders	8	
8th January 2022	Mambo	Community leaders and	9	



Figure 3: Consultation Meeting

Stakeholder Profiling

The following stakeholder categories were identified:

- The Western Area Rural District Council
- WARD councillors
- The Police
- Project Area Community Chiefs

Date	Place	Participants	Number of participants	Contents
8th January 2022	Bawbaw village	community residents	5	
15th January 2022	Tokeh village	Community leaders and community residents	15	
15th January 2022	York village	Community leaders	8	
15th January 2022	Black Johnson	Community leaders and community residents	12	
15th January 2022	Adonkia Police Division, Adonkia	Support Officer	1	To inform and enlighten on; Project objectives, Project components, the scope of the Project, likely significant benefits of the Project, and the purpose and relevance of the consultation as well as importance of stakeholders' institution to the Project. And concerns.
21st January 2022	Ogoo Farm	RoW occupants (Adonkia, New Jersey, Ogoo Farm)	32	To inform and enlighten on; Project objectives, Project Components, the scope of the Project, likely significant benefits of the Project, and the purpose and relevance of the consultation.
22nd January 2022	Mechkem Godenich	RoW occupants (battalion,	9	

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Date	Place	Participants	Number of participants	Contents
		Mechkem, college junction)		To capture and comprehend; participants' perception of the Project, potential benefits, and impacts of the Project, and suggestions on measures to lessen probable negative impacts. To understand from RoW occupants the extent to which they envisage the Project will affect them. And measures to cushion severe effects.
22nd January 2022	Tombo	Community leaders	16	To inform and enlighten on; Project objectives, Project Components, the scope of the Project, likely significant benefits of the Project, and the purpose and relevance of the consultation.
30th January 2022	Kent	Community leaders	5	
6th February 2022	Mama Beach	Community leaders	2	
6th February 2022	Bridget/PWD compound	Community leaders	5	To capture and comprehend; residents' perception of the Project, potential benefits, and suggestions on measures to lessen probable negative impacts.
6th February 2022	Rusel	Community leaders and community residents	11	
13th February 2022	During town	Community leaders	5	
13th February 2022	Kerry town	Community leaders	2	
16th February 2022	Western Area Rural District Council	Environmental Social Officer, and Deputy	2	To inform and enlighten on; Project objectives, Project components, the scope of the Project, likely significant benefits of the Project, and the

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persons to elicit information from the people on various matters associated with their socio-economic status and living conditions. Accordingly, the Mohapewa team is in their community to carry out a Social Impact Assessment of their community which involves the conduct of a Focus Group Discussion meeting with key stakeholders in the affected communities and the random administration of a household survey to traders and residents along the power distribution line route that are most likely to be affected by the implementation of the proposed Project. Following these remarks, the meeting went into an open forum in which the Mohepewa team asked participants a prepared set of questions on their perceptions and concerns about the proposed Project. The answers given by the participants were documented by Mohapewa staff and formed the basis of these minutes.

Date	Place	Participants	Number of participants	Contents
		Chief Administrator		purpose and relevance of the consultation as well as importance of stakeholders' institution to the Project. And concerns. Discuss council's role in the Project implementation

Meeting Procedure

The agenda below was adopted for the meeting.

- Registration of participants
- Opening prayer
- Introduction of the high table
- Introduction of participants
- Purpose of the Meeting (the Consultant)
- Statement from community stakeholders
- Q&A
- Closing prayer.

Summary of Meeting Discussions

At the meeting, stakeholders from communities along the proposed power distribution line from Goderich to Tombo and Kerry Town were most likely to be affected by the Project as shown in the attendance list in the attached (*Annex iv*).

After the opening courtesies of Muslim and Christian prayers and self-introductions, the head of the Mohapewa Social team informed participants that the meeting had been called to inform participants that the Government of Sierra Leone through EDSA is applying for a loan from Japan International Cooperation Agency (JICA) to finance the Extension of Power Distribution System Along the Freetown Peninsula. YACHIYO ENGINEERING CO. LTD is contracted for the "Preparatory Survey for the Project of the Extension of Power Distribution System along the Freetown Peninsula". YEC was to undertake the survey jointly with the Electricity Distribution and Supply Authority (EDSA), the Project's proponent. Under this survey, YEC will be required to hire a qualified local consultant to assist EDSA in complying with environmental and social considerations required by JICA.

Consequently, YEC contracted the services of Mohapewa Co. Limited to carry out an ESIA Study of the Project area, which involves consultations with the Project affected

11.4.2 Stakeholder Concerns and Comments

The following are a summary of concerns during the consultation:

Table 15: Summary of Questions from participants and Responses from the consultants

Topic	Concerns/questions	Response from Consultant
About the Project and exact location of the poles	Where will the Transmission line pass? Left or right of the road?	Going from Goderich through the Peninsula to Kerry Town the distribution line poles will be on the left of the main road
	Where are the exact location of the poles	The poles will be located on the RoW.
	What dimension of each pole	The pole dimension is 1 by 1 metre
Commencement of Construction work and Duration	When will construction work begin?	Construction work will commence after securing the EIA Licence
	How long will construction work last?	The Project will last for one year six months (18 months)
Employment Opportunity	Will the contractor consider the employment of youth in the communities along the RoW?	The policy emphasises that operators or contractors give first consideration to Sierra Leoneans, especially those in the Project area
Electricity connectivity to Communities along the transmission line	Will all the communities along the transmission line be connected to the transmission Line	There will be primary substation (existing Goderich Substation (S/S) to Tombo Substation (S/S) (Approx. 50km) and 11/0.4kV Distribution Transformer (100-500kVA) (Approx. 28 lots) for the communities

Compensation Payment.	Will the Project also provides meter for the communities	No, the distribution of meters is not part of this Project. Meters are bought at designated outlets in Freetown.
	Who will sell electricity to consumers?	Distribution and selling of the electricity generated will be done by EDSA to consumers through pre-paid meters.
	Will compensation be paid to those whose structures and/or businesses are affected?	Yes. A resettlement plan will be prepared that will determine affected persons and the required compensation.
Project completion date?	If one has legal documents for structure along the RoW, will he/she be compensated?	The RoW belongs to Government however if one has a document for the structure, you will bring it forward for examination and onward submission to the appropriate authorities. However, all affected occupants of RoW will be compensated.
	What type of traders or house will you compensate	The transmission line will pass along the government RoW. The Project footprint is very minimal, compensation at this stage is not guaranteed
	When will the Project be completed and we start enjoying the light	The Project is expected to be completed within a year and half

The following table presents a summary of responses from participants during the Focus Group Discussion meetings:

Table 16: Summary of Responses from Focus Group Discussion Meetings

Category	Question	Summary of Response(s)
Knowledge, Perception and Challenges	Do you know about the Goderich-Samuel Town Transmission Line Project?	About 70% of the participants were not aware of the Project
	What is your understanding of the Project?	To provide an uninterrupted electricity
	How do you feel about the Project? (positive, negative, mixed); * ask them to give reasons for how they feel, and list them*	All the participants said they feel very good about such a Project. It will lead to improvement in the quality of life
	What challenges do you foresee in the Project?	Very pessimistic about the completion of the Project, Low voltage, stealing of cables, high tariffs Community engagement and vigilance.
Livelihoods	How would you want those challenges to be addressed?	Trading, fishing, Quarrying, sand mining, Local administration,
	What are the main livelihood activities engaged in this community?	
	What is the range of monthly income generated from livelihood activities?	Three main income brackets were identified low income earners (Le 400,000 to 1 million) Middle income earner (between Le 1,000,000 -3,000,000) Middle income earner above Le 3,000,000 monthly
	Le 50,000 to 250,000	
	Le 251,000+ to 500,000	
	Le 501,000+ to 1000,000	
	Le 1000,001+ to 2000,000	
	Le 2000,000+ to 5000,000	
	Le 5000,000+	
	Do you think your livelihoods will be affected in any way by the Project? Good or bad? Give reasons.	Most of the participants believe that the Project do not have any negative impact on their livelihood. However, traders on the RoW fear that it will losing or disruption of business site Yes, it will be affected in a positive way Not applicable
If bad, how do you think this can be mitigated		

Completion of ESIHA Report	When will the ESIHA report be completed	The report will be complete by end of February 2022.
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Category	Question	Summary of Response(s)
	How much do you spend on lighting home in a month	Monthly Expenditure on lighting homes Ranges between Le 20,000 to Le 150,000

Category	Question	Summary of Response(s)
Positive expectations from Project implementations	<p>Perceived benefits from the Project highlighted by the communities include: Land will appreciate, as more people would come to buy land; Employment opportunities will become available; Educational and health facilities will be improved; Compensation for traders along the Row will increase business activities. Improved social facilities; Business activities within the communities will increase, and NGOs and other development organizations.</p> <p>What do you think is/are the positive expectations from Project</p>	<p>Potential negative impacts of the Project listed by participants include: Increased crime rates as population increases; Influx of people into the communities to settle or in search of jobs and business opportunities resulting in encroachment on the limited social facilities and contributing to the incidence of STIs in the affected communities</p> <p>Between 1 to 20 years</p> <p>Private, lease and government (WARD C)</p> <p>Most respondent outside the RoW have legal document while those on the RoW alleged that land was lease to them by Western Area Rural District Council</p>
Negative expectations from Project	<p>What do you think is/are the negative expectations from Project</p>	<p>It will improve trading activities, health, education and social life. fish and food preservation .</p>
Land Acquisition	<p>How Long have you stayed/done business on the land</p> <p>How did you acquire the land/business site?</p> <p>Do you have legal document for the use of the land</p>	
For Communities without Electricity	<p>How do you think the Project will positively impact livelihood</p>	

SECTION 12: MONITORING AND EVALUATION

The monitoring arrangements are intended to track the resettlement/livelihood implementation performance and will consist of both internal and external monitoring. The MoE will have the overall responsibility for Project coordination, monitoring, and reporting on results achieved in the Project.

12.1 Internal Monitoring and Reporting

Internal monitoring of the resettlement/rehabilitation operations will be undertaken by EDSA following the schedules (including identification of PAPs, land acquisition, compensation of PAPs, and how these PAPs have participated in the Project resettlement preparation and implementation) to be outlined in the resettlement/livelihood plan. The Environmental and Social Management Unit of EDSA is primarily responsible for monitoring resettlement activities. However, the Supervising Engineers will conduct the day-to-day field supervision and capture in the monthly and quarterly progress reports subject to review by EDSA. EDSA will produce quarterly reports for the MoE and JICA.

12.2 External Monitoring and Reporting

The Project shall incorporate external monitors. Independent monitoring shall be commissioned for the Project. Civil Society Organizations (CSOs) are often suitable for such task. The independent monitor shall monitor engagements with the PAPs until compensation payments are made and the demolition of affected properties is concluded. This task will be carried out in parallel with implementing the resettlement/livelihood activity.

As part of promoting greater community participation and involvement in the Project and encouraging a sense of ownership, the local council (WARDC) and Project communities should be involved in monitoring resettlement implementation. For this purpose, they need to be adequately sensitized on land issues and transfer procedures and conditions governing such transfers. This will create a better understanding of the land issues related to the Project.

The monitoring system will:

- Inform the Environmental and Social Management Unit of EDSA on the progress and performance of the land acquisition;

- Number of households enrolled for the livelihood restoration program
- Document timely completion of the Project resettlement obligations for all permanent and temporary losses, as well as unanticipated, additional construction damages;
- Status of ongoing income restoration activities;
- Number of vulnerable households supported during the transition period; and
- Records on grievances received, number of grievances resolved, number of grievances pending resolution, number of Project grievances escalated and forwarded to the Law Court;

12.3 Monitoring Indicators

While taking lead responsibility, MoE and the Environmental and Social Management Unit of EDSA shall track the preparation and implementation of the Resettlement/livelihood plan. They shall closely monitor the following indicators as shown in *Table 17*.

Table 17: Sample Resettlement/Livelihood Monitoring Indicators

No.	Monitoring	Specific Indicator	Frequency
1.	Social and Economic Monitoring	Provide the number of PAPs: i) Whose livelihoods have been restored to pre-Project level, ii) whose livelihoods have improved beyond the pre-Project level, iii) whose livelihoods are worse than the pre-Project level	Monthly until the end of Resettlement/Livelihood implementation
2.	Private Structures	Provide the number of PAPs: i) whose livelihood has been restored to pre-Project level, ii) whose livelihoods improved beyond the pre-Project level, iii) whose livelihood are worse than the pre-Project level	Monthly until the end of Resettlement/Livelihood implementation
3.	Public Structures	Provide the number of PAPs: i) whose livelihoods have been restored to pre-Project level, ii) whose livelihoods have improved beyond the pre-Project level, iii) whose livelihoods are worse than the pre-Project level	Monthly until the end of Resettlement/Livelihood implementation
4.	Economic Crops	Track progress on: i) number and type of economic crops planted by affected farmers, ii) number of farmers who have restored their income to pre-Project level, iii) the number of farmers who have not restored their income to pre-Project level, iv) the number of farmers whose income has been restored beyond the pre-Project level, v) the number of affected farmers	Monthly until the end of Resettlement/Livelihood implementation

No.	Monitoring	Specific Indicator	Frequency
5.	Assistance to Businesses	who have changed their livelihoods from farming to other livelihood activities. Track progress on: i) number of affected businesses that have resumed business operations, ii) number of businesses that have restored net income to pre-Project levels, iii) number of businesses that have restored their net income beyond the pre-Project level, iv) number of affected businesses that have not resumed operations	Monthly until the end of Resettlement/Livelihood implementation
6.	Vulnerable Groups	Provide the number of vulnerable PAPs: i) whose livelihoods have been restored to pre-Project level, ii) whose livelihoods have improved beyond the pre-Project level, iii) whose livelihoods are worse than pre-Project level, iv) who have received assistance from the special package, v) who are sick and who benefitted from health service in the Project area, vi) the number of disabled-friendly facilities constructed by the Project such as access ramps from the main road to their living quarters or neighbourhood.	Monthly until the end of Resettlement/Livelihood implementation
7.	Tenants	Provide the number of affected tenants: i) who have found new rental places, ii) who reported that the rental allowance is inadequate, iii) who showed satisfaction over their new rental places compared to the ones they occupied before the Project, iv) the number of tenants who have not yet found rental places.	Monthly until the end of Resettlement/Livelihood implementation

12.4 Evaluation (Completion Audit)

An audit will be done to determine whether the efforts to restore the living standards of the affected population have been adequately designed and executed. This completion audit will verify that all physical inputs earmarked in the Resettlement/Livelihood have been delivered and all services provided. The audit will also evaluate if the mitigation actions prescribed in the Resettlement/Livelihood plan have had the desired effect. The baseline conditions of the affected parties before the relocation will be used as a measure against their socio-economic status after the resettlement.

The exercise shall provide the feedback needed to adjust the resettlement/livelihood plan and take corrective action. The evaluation shall have the following specific objectives:

- General assessment of the implementation of resettlement activities;
- Examine compliance of the implementation of resettlement activities with national laws, regulations, JICA Guidelines and World Bank ESS5;
- Assessment of resettlement and compensation procedures as outlined in the RF and ESS5;
- Evaluation of the impact of the resettlement and compensation programs on PAP incomes and standards of living, with focus on the “no worse-off if not better-off” requirement;
- Identify actions to be taken as part of the ongoing monitoring exercises to improve resettlement/livelihood implementation.

No.	Monitoring	Specific Indicator	Frequency
8.	Grievances and grievance management system	Track grievances and report: i) number of cases at each impact location, ii) the number of cases resolved, iii) number of cases pending, iv) reasons for pending cases, v) frequency of GRM meetings, vi) description of compliance to GRM procedures	Monthly until the end of Resettlement/Livelihood implementation

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ANNEXES

Annex i: List of Possible Affected Assets

No	Photo Code	Description	Latitude	Longitude
1	P001	Timber/stick sales point	8.431359	-13.277353
2	P002	Timber/stick sales point	8.431689	-13.277423
3	P003	Timber/stick sales point	8.430568	-13.277481
4	P004	Movable business Tables	8.430568	-13.277477
5	P006	Building material shop close to the pole.	8.429744	-13.277472
6	P007	Boutique	8.429459	-13.2775
7	P008	Makeshift structure	8.428337	-13.27759
8	P009	Makeshift about 2 meters from the pole	8.428282	-13.277564
9	P011	Mercury sales point	8.427084	-13.277785
10	P012	Flowers around pole	8.427093	-13.277878
11	P014	Mango tree close to the pole. It leaves around the pole	8.424816	-13.277144
12	P020	Tree and a business table	8.422091	-13.275238
13	P022	Few stands of crops around the pole	8.421224	-13.274512
14	P024	Sale of used tyres near the pole	8.421041	-13.274088
15	P028	Timber sales point	8.419392	-13.27205
16	P029	Timber sales point	8.418994	-13.271499
17	P034	Movable businesses around	8.416581	-13.268622
18	P035	Structure built around the pole	8.416106	-13.26802
19	P036	Structure built around the pole	8.415782	-13.26746
20	P038	Tree around the pole	8.41544	-13.26655
21	P041	Makeshift built around the pole	8.41386	-13.265376
22	P048	Movable kiosk close to the pole	8.410109	-13.262637
23	P049	A movable business table near the pole	8.409506	-13.262188
24	P050	Makeshift around pole	8.409491	-13.262184
25	P051	Timber sales point	8.409008	-13.261681
26	P053	Movable business close to the pole	8.407098	-13.260438
27	P057	Makeshift business structures around		
28	P058	Makeshift business structures around	8.404079	-13.26206
29				
30	P061	Makeshift about 0.2 meters off pole on one end	8.403744	-13.262599
30	P062	Makeshift about 0.1 meter off pole	8.402668	-13.262943

31	P063	Metal kiosk about 0.2 meters off pole on one end	8.402296	-13.26323
32	P070	Timber selling	8.398283	-13.26316
33	P072	Makeshift about 0.1 meter off pole	8.397462	-13.262624
34	P073	20 feet container about 2 meters off pole	8.396612	-13.262381
35	P077	Kiosk about 1 meter off pole	8.395147	-13.261422
36	P078	Pole between two makeshift Kiosks about 0.1 meters from each kiosk.	8.39395	-13.261216
37	P079	Makeshift about 1.6 meters off pole	8.393504	-13.260223
38	P082	Short wood fence about 0.1 meters off pole	8.391462	-13.259855
39	P084	Makeshift about 0.1 meter off pole on one end	8.391458	-13.258154
40	P087	Storey building about 4.5 meters off pole	8.389203	-13.255897
41	P094	Construction of concrete structure ongoing close to the pole	8.388106	-13.253609
42	P095	makeshift structure around the pole	8.387611	-13.252663
43	P097	Makeshift about 1 meter off the pole. And the tree closer to the pole	8.387342	-13.251863
44	P102	Fence about 2.5 meters off pole	8.386897	-13.249421
45	P107	Mango tree closer to pole	8.386189	-13.24669
46	P115	Pole between two makeshifts about 1 meter off each makeshift structure.	8.383069	-13.244653
47	P117	Timber selling point	8.381733	-13.244321
48	P118	Fence about 0.1 meter off pole	8.38191	-13.243978
49	P119	Kiosk about 0.1 meter off pole	8.380858	-13.243373
50	P120	Makeshift about 1 meter off pole on one end.	8.381184	-13.243204
51	P121	Tree closer to pole	8.38071	-13.242074
52	P124	Makeshift about 0.1 meter off pole	8.378978	-13.241223
53	P125	Metal makeshift about 1.5 meters off pole	8.388314	-13.255026
54	P127	Makeshift about 1.6 meters off pole	8.377589	-13.240759
55	P131	Fence about 1.3 meters off pole	8.3754	-13.239756
56	P133	Makeshifts around pole	8.375359	-13.239571
57	P134	Pole inside makeshift	8.374341	-13.237498
58	P135	Makeshift and timber selling around the pole	8.374311	-13.235313
59	P138	Pole inside makeshift	8.372633	-13.235362
60	P141	Pole inside makeshift	8.370714	-13.23325
61	P144	Makeshift around pole	8.369739	-13.232678
62	P150	Makeshift about 1 meter off pole	8.365685	-13.231959
63	P151	Makeshifts about 0.2 meters off pole on two sides	8.36501	-13.232034
64	P152	Pole between block buildings	8.364318	-13.232119

65	P157	Tree shrub around the pole	8.360935	-13.231489
66	P165	Makeshift around the pole	8.355808	-13.230581

Annex ii: Indicative Outline of Resettlement/Livelihood Plan

According to the World Bank ESS5, the minimum elements of a resettlement plan are as follows:

1. Description of the project: General description of the project and identification of the project area.
2. Potential impacts. Identification of:
 - (a) the project components or activities that give rise to displacement, explaining why the selected land must be acquired for use within the timeframe of the project;
 - (b) the zone of impact of such components or activities;
 - (c) the scope and scale of land acquisition and impacts on structures and other fixed assets;
 - (d) any project-imposed restrictions on use of, or access to, land or natural resources;
 - (e) alternatives considered to avoid or minimize displacement and why those were rejected; and
 - (f) the mechanisms established to minimize displacement, to the extent possible, during project implementation.
3. Objectives: The main objectives of the resettlement program

2. Census survey and baseline socio-economic studies. The findings of a household-level census identifying and enumerating affected persons, surveying land, structures, and other fixed assets to be affected by the project. The census survey also serves other essential functions:
 - a) identifying characteristics of displaced households, including a description of production systems; labor, and household organization; and baseline information on livelihoods (including, as relevant, production levels and income derived from both formal and informal economic activities) and standards of living (including health status) of the displaced population;
 - b) information on vulnerable groups or persons for whom special provisions may have to be made;
 - c) identifying public or community infrastructure, property or services that may be affected;

- d) providing a basis for the design of, and budgeting for, the resettlement program;
- e) in conjunction with the establishment of a cutoff date, providing a basis for excluding ineligible people from compensation and resettlement assistance; and
- f) establishing baseline conditions for monitoring and evaluation purposes.

As the World Bank may deem relevant, additional studies on the following subjects may be required to supplement or inform the census survey:

- g) land tenure and transfer systems, including an inventory of common property natural resources from which people derive their livelihoods and sustenance, non-title-based usufruct systems (including fishing, grazing, or use of forest areas) governed by locally recognized land allocation mechanisms and any issues raised by different tenure systems in the project area;
 - h) the patterns of social interaction in the affected communities, including social networks and social support systems, and how they will be affected by the project; and
 - i) social and cultural characteristics of displaced communities, including a description of formal and informal institutions (e.g., community organizations, ritual groups, non-governmental organizations (NGOs)) that may be relevant to the consultation strategy and to designing and implementing the resettlement activities.
3. Legal framework. The findings of an analysis of the legal framework, covering:
 - a) the scope of the power of compulsory acquisition and imposition of land use restriction and the nature of compensation associated with it, in terms of both the valuation methodology and the timing of payment;
 - b) the applicable legal and administrative procedures, including a description of the remedies available to displaced persons in the judicial process and the normal timeframe for such procedures, and any available grievance redress mechanisms that may be relevant to the project;
 - c) laws and regulations relating to the agencies responsible for implementing resettlement activities; and
 - d) gaps, if any, between local laws and practices covering compulsory acquisition, imposition of land use restrictions and provision of resettlement measures and ESS5, and the mechanisms to bridge such gaps.

4. Institutional framework. The findings of an analysis of the institutional framework covering:
 - a) the identification of agencies responsible for resettlement activities and NGOs/CSOs that may have a role in project implementation, including providing support for displaced persons;
 - b) an assessment of the institutional capacity of such agencies and NGOs/CSOs; and
 - c) any steps that are proposed to enhance the institutional capacity of agencies and NGOs/CSOs responsible for resettlement implementation.
5. Eligibility. Definition of displaced persons and criteria for determining their eligibility for compensation and other resettlement assistance, including relevant cutoff dates.
6. Valuation of and compensation for losses. The methodology to be used in valuing losses to determine their replacement cost; and a description of the proposed types and levels of compensation for land, natural resources and other assets under local law and such supplementary measures as are necessary to achieve replacement cost for them.
7. Community participation. Involvement of displaced persons (including host communities, where relevant):
 - a) a description of the strategy for consultation with, and participation of, displaced persons in the design and implementation of the resettlement activities;
 - b) a summary of the views expressed and how these views were taken into account in preparing the resettlement plan;
 - c) A review of the resettlement alternatives presented and the choices made by displaced persons regarding options available to them; and
 - d) institutionalized arrangements by which displaced people can communicate their concerns to project authorities throughout planning and implementation. These measures ensure that such vulnerable groups as indigenous people, ethnic minorities, the landless, and women are adequately represented.
8. Implementation schedule. An implementation schedule providing anticipated dates for displacement and estimated initiation and completion dates for all resettlement plan activities. The schedule should indicate how the resettlement activities are linked to the implementation of the overall project.
9. Costs and budget. Tables showing categorized cost estimates for all resettlement activities, including allowances for inflation, population growth, and other contingencies; timetables for expenditures; sources of funds; and arrangements

for timely flow of funds, and funding for resettlement, if any, in areas outside the jurisdiction of the implementing agencies.

10. Grievance redress mechanism. The plan describes affordable and accessible procedures for the third-party settlement of disputes arising from displacement or resettlement; such grievance mechanisms should take into account the availability of judicial recourse and community and traditional dispute settlement mechanisms.
11. Monitoring and evaluation. Arrangements for monitoring of displacement and resettlement activities by the implementing agency, supplemented by third-party monitors as considered appropriate by the Bank, to ensure complete and objective information; performance monitoring indicators to measure inputs, outputs, and outcomes for resettlement activities; involvement of the displaced persons in the monitoring process; evaluation of results for a reasonable period after all resettlement activities have been completed; using the results of resettlement monitoring to guide subsequent implementation.
12. Arrangements for adaptive management. The plan should include provisions for adapting resettlement implementation in response to unanticipated changes in project conditions, or unanticipated obstacles to achieving satisfactory resettlement outcomes.

Annex iii: Sample Grievance Redressal Form

-GRIEVANCE AND RESOLUTION FORM FOR RESETTLEMENT AND COMPENSATION-

Name (Filer of Complaint):
 ID Number (PAP's ID number):
 Contact Information (house number/ mobile phone):
 Nature of Grievance or Complaint:
 Date:
 Individuals Contacted:
 Signature:
 Signed (Filer of Complaint):
 Name of Person Filing Complaint (if different from Filer):
 Position or Relationship to Filer:
 Date of Conciliation Session:
 Was Filer Present?:
 Was field verification of complaint conducted?:
 Findings of field investigation:

Summary of Conciliation Session Discussion
 Issues:
 Was agreement reached on the issues?
 If agreement was reached, detail the agreement below:
 If agreement was not reached, specify the points of disagreement below:

Signed (Conciliator):
 Signed (Filer):
 Signed (Independent Observer):
 Date:

Annex iv: Consultation Attendance List

MOHAPEWA
 Dealer in Swaziland Production

MOHAPEWA is a registered company in Swaziland with registration number 15172/2021

Name: Lukha Date: 15/12/2021

No.	Name	Signature
1	Mphahlele Mkhabela, Executive Director	[Signature]
2	Chief Executive Officer, Community Bank	[Signature]
3	Chief Executive Officer, Standard Bank	[Signature]
4	Chief Executive Officer, Standard Bank	[Signature]
5	Executive Director, Nkomo	[Signature]
6	Executive Director, Nkomo	[Signature]
7	Executive Director, Nkomo	[Signature]

MOHAPEWA
 Dealer in Swaziland Production

MOHAPEWA is a registered company in Swaziland with registration number 15172/2021

Name: Diplo T. Tshabalala Date: 15/12/2021

No.	Name	Signature
1	Mphahlele Mkhabela, Executive Director	[Signature]
2	Chief Executive Officer, Community Bank	[Signature]
3	Chief Executive Officer, Standard Bank	[Signature]
4	Chief Executive Officer, Standard Bank	[Signature]
5	Executive Director, Nkomo	[Signature]
6	Executive Director, Nkomo	[Signature]
7	Executive Director, Nkomo	[Signature]

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULAR

LOCATION: Funtua DATE: 17th/12/2021

No.	Name	Designation	Phone Number	Signature
9	Faduwati Bangura	Youtie		<i>[Signature]</i>
10	Daddy Karama	Chairman		<i>[Signature]</i>
11	Mustapha P. Karama	Former Chairman		<i>[Signature]</i>
12	Kadiolu Karama	Stakeholder		<i>[Signature]</i>
13	Estimuel Mansaray	Youtie		<i>[Signature]</i>
14	Dussemanis Sany (Stakeholder)	Stakeholder		<i>[Signature]</i>

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULAR

LOCATION: Ogija DATE: 17.12.2021

No.	Name	Designation	Phone Number	Signature
	Selawati	Youtie		<i>[Signature]</i>
	Baba Saig	Community head		<i>[Signature]</i>
	Mohamed A. Karama	✓		<i>[Signature]</i>
	Shefa Kaboral			<i>[Signature]</i>

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULAR

LOCATION: Tanda Boce DATE: 17th/12/2021

No.	Name	Designation	Phone Number	Signature
1	Sarah Bah	Head of TA		<i>[Signature]</i>
2	Abdul B. Saiss	CAH Chairman		<i>[Signature]</i>
3	Saatiye B. Saiss	Tanda Boce Head		<i>[Signature]</i>
4	Alimamy Saiss	Chief		<i>[Signature]</i>
5	M. Alimamy Saiss	Chief		<i>[Signature]</i>
6	M. Alimamy Saiss	Chief		<i>[Signature]</i>
7	Zakaria Kadiou	Sub head		<i>[Signature]</i>
8	MICHAEL K. BEIGA	SUPERVISOR HEAD		<i>[Signature]</i>
9	Mohamed S. Bah	Youtie Head		<i>[Signature]</i>

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULAR

LOCATION: Funtua DATE: 17/12/2021

No.	Name	Designation	Phone Number	Signature
1	Abdul M. Karama	Youtie		<i>[Signature]</i>
2	Shekka Farnah	Head		<i>[Signature]</i>
3	Fadya Saiss	Deputy Head		<i>[Signature]</i>
4	Pst. Mansur Dumbuya	Religious Head		<i>[Signature]</i>
5	Mu. Karama	Youtie		<i>[Signature]</i>
6	Mohamed Amin Mansaray	Youtie		<i>[Signature]</i>
7	Abdina Ayese Karama	Youtie		<i>[Signature]</i>
8	Umaru Karama	Youtie		<i>[Signature]</i>

Tomboro 20/01/22

MOHAPEWA
Dealer in Spectra Precision

Project Public Consultation: MOHANE MINING LIMITED EA STUDY
Location: Bukawa Village Date: 21/1/22

No	Name	Designation	Phone Number	Signature
1	Mr. Alex Jisa Brantama	Headman	[Redacted]	[Signature]
2	Mr. P. James Manamelay	Sec. General	[Redacted]	[Signature]
3	Mr. Bangun	Community Stakeholder	[Redacted]	[Signature]
4	Mr. Basilio Wiland	Stakeholder	[Redacted]	[Signature]
5	Praktika T-yul	Community Stakeholder	[Redacted]	[Signature]

MOHAPEWA
Dealer in Spectra Precision

Project Public Consultation: MOHANE MINING LIMITED EA STUDY
Location: Bukawa Village Date: 21/1/22

No	Name	Designation	Phone Number	Signature
1	Alex Jisa Brantama	Headman	[Redacted]	[Signature]
2	P. James Manamelay	Sec. General	[Redacted]	[Signature]
3	Mr. Bangun	Community Stakeholder	[Redacted]	[Signature]
4	Mr. Basilio Wiland	Stakeholder	[Redacted]	[Signature]
5	Praktika T-yul	Community Stakeholder	[Redacted]	[Signature]

MOHAPEWA
Dealer in Spectra Precision

Project Public Consultation: MOHANE MINING LIMITED EA STUDY
Location: Bukawa Village Date: 21/1/22

No	Name	Designation	Phone Number	Signature
1	Alex Jisa Brantama	Headman	[Redacted]	[Signature]
2	P. James Manamelay	Sec. General	[Redacted]	[Signature]
3	Mr. Bangun	Community Stakeholder	[Redacted]	[Signature]
4	Mr. Basilio Wiland	Stakeholder	[Redacted]	[Signature]
5	Praktika T-yul	Community Stakeholder	[Redacted]	[Signature]

MOHAPEWA
Dealer in Spectra Precision

Project Public Consultation: ENVIRONMENTAL AND SOCIAL CONSEQUENCES STUDY FOR PREPARATION SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE PRETOWN PRINCIPALIA
Location: Prakab. 2 Date: 21/1/22

No	Name	Designation	Phone Number	Signature
1	Mohamed Saena	Headman	[Redacted]	[Signature]
2	Mike Boding	Youth Representative	[Redacted]	[Signature]
3	Jay Jay	Women	[Redacted]	[Signature]
4	Djabrut	Youth	[Redacted]	[Signature]
5	Zahariza Smith	Youth	[Redacted]	[Signature]
6	Mary Luning	Elder	[Redacted]	[Signature]
7	Mohamed Saena	Elder	[Redacted]	[Signature]
8	Terry Sosa M.	Youth	[Redacted]	[Signature]
9	Daud Kanoro	Headman	[Redacted]	[Signature]

15/10/2022

Attendance

No.	Name	Community/Village	Designation/Position	Phone Number	Signature
1	Alhaji James Stone	✓	Headman		
2	Sharif Bangura	✓	Village Secretary		
3	Tommy George	✓	Assistant		
4	Phillip Gakwendo	✓	Community Leader		
5	Tommy Decker II	✓	Headman		
6	Hassan Bangura	✓	Asst Headman		
7	Amir Elvins	✓	SEC		
8	Lamin Koroma	✓	Youth Chairman		
9	Abraham Kumbo	✓	Member		
10	Abibatu Johnson	✓	Member		
11	Unisa Fanga	✓	Member		
12	Sulaiman Karama	✓	Member		
13	Fatmata Karama	✓	Member		
14	Rangate M. Bangura	✓	Member		
15	Kadiatu Sesay	✓	Member		

15/10/2022

Attendance

No.	Name	Community/Village	Designation/Position	Phone Number	Signature
1	Junisa Felis	✓	Secretary		
2	Abu Bakari Karama	✓	Headman		
3	Moses H. Thalleh	✓	Youth Chairman		
4	Muhammad Kumbha	✓	Member		
5	Poi Alhany Geba	✓	Member		
6	Muhammad S. Kumbha	✓	Member		
7	A. Sheela Fomoro	✓	Black Woman		
8	Moses Biliwa	✓	Member		
9	Abraham Karama	✓	Member		

15/10/2022

MOHAPEWA
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No.	Name	Designation	Phone Number	Signature
10	Mohd Bangura	Member		
11	Abraham J. Bangura	Member		
12	Mohd Sesay	Secretary		

15/10/2022

ATTENDANCE
Project: The Extension of Power Distribution System along the Freetown Peninsula

No.	Name	Community/Village	Designation/Position	Phone Number	Signature
1	Elizabeth Brown	YORK	Chairwoman		
2	Samuel Fawcett	YORK	Member		
3	Francis Maitland	YORK	Member		
4	Raymond Fawcett	YORK	Member		
5	Jurick Pratt	YORK	Member		
6	Edmond Sabong	YORK	Member		
7	Edmond Sabong	YORK	Member		
	Nathaniel Turner	YORK	Secretary		

MOHAPEWA
Dealer in Spectra Precision

PROJECT PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSULTATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULAR
Location: Opes Farm - FSD

No.	Name	Designation	Phone Number	Signature
	Samir Ibrahim	Farmer		
	Tim Ticker	New Jersey		
	Mouss Saareh	Opes Farm		
	Richard James	New Jersey		
	Karim Banga	Opes Farm		
	Hussein Mamboury	Opes Farm		
	David Clewley	Opes Farm		
	Muhammad Karama	Opes Farm		
	Hassan B. Saad	Opes Farm		
	Amrita Karam	Opes Farm		
	Idriss L. C.	Opes Farm		

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Dealer in Spectra Precision

PROJECT PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSULTATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULAR
Location: Opes Farm - FSD

No.	Name	Designation	Phone Number	Signature
	Ally Ali Ballal	Opes Farm		
	Samuel Frangie	Opes Farm		
	Muhammad BANAWRA	Opes Farm		
	Fahif Moughit	Opes Farm		
	Abdulle	Opes Farm		
	Alioum of Coulib	Opes Farm		
	Serodio Coulib	Opes Farm		
	Muhammad Karam	Opes Farm		

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Dealer in Spectra Precision

PROJECT PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSULTATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULAR
Location: Opes Farm - FSD

No.	Name	Designation	Phone Number	Signature
1	Muhammad S. Long	Opes Farm		
2	Abubakar Bangura	Opes Farm		
3	Kadiata Coulib	Opes Farm		
4	Mr. Muhammad Coulib	Opes Farm		
	Muhammad S. Long	Opes Farm		
	Samuel Frangie	Opes Farm		
	Muhammad Karam	Opes Farm		
	Muhammad Karam	Opes Farm		
	Muhammad Karam	Opes Farm		
	Samuel Frangie	Opes Farm		
	Muhammad Karam	Opes Farm		

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Dealer in Spectra Precision

PROJECT PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSULTATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULAR
Location: Opes Farm - FSD

No.	Name	Designation	Phone Number	Signature
1	Tim Ticker	New Jersey		
2	Muhammad Saareh	Opes Farm		
3	Muhammad Karam	Opes Farm		
4	David Clewley	Opes Farm		
5	Muhammad Karam	Opes Farm		

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULA

LOCATION: Brigade/PAEP, Free Press DATE: 13-2-2022

No	Name	Designation	Phone Number	Signature
1	Toussaint Mully	Community	[REDACTED]	[Signature]
2	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
3	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
4	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
5	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULA

LOCATION: Brigade/PAEP, Free Press DATE: 13-2-2022

No	Name	Designation	Phone Number	Signature
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2	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
3	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
4	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
5	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULA

LOCATION: Brigade/PAEP, Free Press DATE: 13-2-2022

No	Name	Designation	Phone Number	Signature
1	Toussaint Mully	Community	[REDACTED]	[Signature]
2	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
3	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
4	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
5	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]

MOHAPEWA
Dealer in Spectra Precision

PROJECT: PUBLIC CONSULTATION, ENVIRONMENTAL AND SOCIAL CONSIDERATIONS STUDY FOR PREPARATORY SURVEY FOR THE EXTENSION OF POWER DISTRIBUTION SYSTEM ALONG THE FREETOWN PENINSULA

LOCATION: Brigade/PAEP, Free Press DATE: 13-2-2022

No	Name	Designation	Phone Number	Signature
1	Toussaint Mully	Community	[REDACTED]	[Signature]
2	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
3	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
4	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]
5	Josephine Robinson	Deputy Headman	[REDACTED]	[Signature]

Annex v: Consultation Pictures



**15. Rainy Season Environmental Baseline
Study Report**

**Rainy Season Environmental
Baseline Study For the Project of
Extension of Power Distribution
System**

**Along the Freetown Peninsula in the
Republic of Sierra Leone**

August 2022



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Introduction

Through the Electricity Distribution and Supply Authority (EDSA), the Government of Sierra Leone (GoSL) is applying for a loan from the Japan International Cooperation Agency (JICA) to finance the Project of Extension of Power Distribution System along the Freetown Peninsula. The Project's main aim is to expand and stabilise the power supply in the southwest part of the Freetown Peninsula from Goderich to Kerry Town via Sussex, Tokeh, York, Kent, Tombo etc. communities by constructing two new primary substations, secondary substations and transmission/distribution network to contribute to the reduction of poverty, the stability of society and the establishment of peace.

As part of the Project preparation, EDSA has prepared an Environmental, Social and Health Impact Assessment (ESHIA) Report based on the dry season environmental baseline study conducted from December 2021 to February 2022.

In addition to the dry season environmental baseline study, JICA Study Team conducted a rainy season environmental baseline study from July to August 2022. This Report presents the findings of the rainy season environmental baseline study on the same sites and specific locations surveyed in the dry season. Three environmental parameters (i.e. air quality, water and flora and fauna) were monitored during this study. To determine the locations/points surveyed in the dry season, the coordinates were loaded into handheld electronic notepads running the Android operating system and the SW Maps software. SW Maps allows Google Earth satellite images to be loaded in real-time, overlaid by the vector points and an icon representing the real-time GPS coordinates of the user's position. Thus, field crews could see their current position and inputted points.

ECOLOGICAL ASSESSMENT

Study Methodology

This ecological survey was carried out in 70 locations where the distribution line project will be implemented. The extent of the survey covered the following areas within the specified locations:

- (i) Areas within the immediate surroundings of the proposed location of the Project.
- (ii) Areas within 500m radius of the Project sites, including all landscape features: human settlement, forest, farm bush, swamps and bridges, any species or ecology of interest.

Four key thematic areas constituted this ecological assessment, which are considered as appropriate indicators of environmental health.

- Vegetation and Botanic assessment
- Mammals
- Birds
- Herpes (reptiles and amphibians)

Vegetation and plant composition

The survey was conducted to assess the botanical characteristics of the sites to be involved in the construction and operation of the Project. *Table 1* shows the names and locations of the sites visited; these are consistent with the sites where the birds, mammals, and herpetological surveys were conducted:

Table 1: Locations of sites surveyed for vegetation and botanic assessment

Start Point	Eastings	Northings	Dominant Vegetation
Waterloo -Mammah Beach Beach axis (Site 1)			
Benguema	711913	919394	Elephants grass mix with stands of mango <i>Mangifera indica</i> , mix with sparse wild palm along the stream and Baboon cane forest patches.

Benguema	712018	919235	Stands of mango <i>Mangifera indica</i> mix with sparse wild palm along the stream and Baboon cane forest patches. Swampy.
Middletown	711437	916939	Degraded farm bush dominated with <i>Chromolaena odorata</i> species and sparse wild palm.
Middle Town	711529	916939	Swamp looks inland valley dominated with cassava plant and vegetables gardens.
Macdonald	711423	915564	Stream alongside with patches of gallery forest, degraded farm bush
Macdonald	711531	915504	Inland valley swamp stream sparse gallery patches, sparse wild palm mix with elephant grass and <i>Chromolaena odorata</i> plant.
During Town	711133	912243	Degraded farm bush, grassland hilly forest patches and open stands of wild palm
During Town	711018	912274	Degraded farm bush, hilly forest gallery patches with invasive species plant <i>Chromolaena odorata</i> at the edges.
Madina Town	710071	909788	Open areas grassland highly degraded rocky boulders.
Madina Town	710171	909727	Stream along the bridge inland valley canopy forest trees.
Tombo Town End - Point	709259	908494	Sparse tree stands of <i>Acacia</i> and <i>Mangifera indica</i> , forest regrowth, human settlement and housing construction.

Kissy Town	708239	907547	Degraded farm bush stands of wild palm and mix species plant <i>Gmeliana aborea</i> , and mango <i>Mangifera indica</i> , and patches of forest on the hillside
Kissy Town	708141	907213	Degraded farm bush, elephant grass <i>Panicum maximum</i> dominated vegetation and patches of <i>Acacia</i> spp. and <i>Parkia</i> spp. Trees.
Mammah Beach Quarry	705959	907564	Degraded farm bush, grassland hilly forest patches and open stands of wild palm.
Kent – York axis (Site 2)			
Kent area	704188	908208	Degraded forest on the hilly side (part of the WAPNP) and shrubby and grassy vegetation on the seaside.
John Obey	704660	909419	Degraded farm bush, hilly forest gallery patches with invasive species plant <i>Chromolaena odorata</i> at the edges.
John Obey	704433	909366	Open dry areas grassland burnt towards the Atlantic Ocean.
John Obey	703505	911798	Stream rocky boulders and gallery forest with different species of plant.
Black Johnson	703015	915345	Degraded farm bush dominated with <i>Chromolaena odorata</i> species plant and mix with open stands of wild palm.
York	701337	916772	Open flat grassland area, degraded farm bush along hilly patches of forest and stands of wild palm.

Tokeh	700247	918823	Stream inland valley swamp, hilly degraded farm bushes dominated grassland.
Tokeh	700534	918756	Degraded farm bush clearing areas grassland and hilly forest patches.
Tokeh - Sussex Farm axis (Site 3)			
Banga Farm (Sussex)	694732	924573	Hilly environment with tree stands mainly comprising mango <i>Mangifera indica</i> , Cashew nut, pawpaw <i>Carica papaya</i> and Banana <i>Musa sapientu</i> plants. The edge of the forest is within 500 of the main road.
Borbor Community	696586	922586	Hilly environment with tree stands mainly comprising mango <i>Mangifera indica</i> , Cashew nut, pawpaw <i>Carica papaya</i> and Banana <i>Musa sapientu</i> plants. The edge of the forest is within 500 of the main road.
No 2 Biobaray Guma Trail	700068	923628	Degraded farm bush and few patches of gallery forest inundated by housing construction on either sides of the road.
No 2 Biobaray Guma Trail	700058	922909	Degraded farm bush and few patches of gallery forest inundated by housing construction on either sides of the road.
Grassfield Tokeh	699998	921146	Degraded farm bush, grassland hilly forest patches and human settlement.
Tokeh Junction End - Point	699561	919849	Degraded farm bush, hilly forest gallery patches with invasive species plant <i>Chromolaena odorata</i> at the edges.

Three Core Areas within the WAPNP (Western Area Peninsula National Park)				
WAPNP 1	Forest adjacent to John Obey	706861	912644	The site is a core forest area located at 3.2 kilometres from John Obey, with an elevation of 710 m asl.
WAPNP 2	Forest adjacent to Tokeh	703412	919707	The site is a core forest area located at 3.17 kilometres from Tokeh, with an elevation of 398 m asl.
WAPNP 3	Forest adjacent to Mambo	696429	929076	The site is a core forest area located at 3.2 kilometres from Mambo, with an elevation of 702 m asl.

The survey methods applied here are consistent with a rapid assessment, which mainly involves determining vegetation types and distribution from observations in and around specific locations, distribution of the project distribution line route and along defined transects running through main habitat types in the environs of the proposed site, respectively. The broad vegetation categories encountered in the project area were classified based on the biogeography representation of the country and/or sub-region (see Cole, 1978). The recorded plant species were checked for conservation status by referring to the IUCN Red List (2021) and by considering their regional distribution.

Mammals and Birds

The survey sites for mammals and birds were consistent with the sites visited for vegetation and botanic assessment, as given in *Table 1*. Data on mammals were obtained mainly through interviews with local people and hunters and visual evidence, such as faecal droppings, footprints, and nesting sites. At least two to five

people, including hunters and farmers, were interviewed in the adjacent settlements associated with the project area. Some degree of triangulation was done to give credence to the information provided by the respondents. A field guide to mammals of Africa (Kingdon 1997) and birds of West Africa (Borrow and Demey 2014) were reference materials used particularly to show pictures to respondents of mammals and birds that possibly occur in the area. The recorded mammal and bird species were checked for conservation status by referring to the IUCN Red List (2021) and by considering their regional distribution and abundance (e.g., asking local informants whether those species are confined to the Project area, or they also exist in other places).

Herpes (Reptiles and Amphibians)

Herpes were surveyed through the use of some of the standard methods in rapid assessment of their diversity and distribution. An extensive search was the main method employed whereby known and suspected habitats were checked through the lifting of small rocks and clearing of leaf litter where amphibians usually hide. A general search of relevant habitats and interviews with local people were used to assess the diversity of snakes on both sides of the road corridor and proposed primary substation sites at York and Tombo.

RESULTS AND DISCUSSION

Vegetation

The descriptions and photos below give a general landscape view of the sites, including the specific site features for the implementation of the Project. The general view of the landscape is that of a mosaic of various states of the vegetation and the components that influence the ecology. Much of the mosaic is human settlement surrounded by various degrees of vegetation degradation and regrowth, under different regimes of human influence such as agriculture, housing construction and settlement expansion.

The vegetation of the 28 sites visited along the proposed transmission line corridor, can generally be described as having the similar plant distribution and physiognomy because they seem to be influenced by similar environmental and anthropogenic factors, except for few differences at Mammah Beach and Tokeh community where signs of forest. Each of the sites proposed for the project is surrounded by human settlement to a more or less extent depending on the location. Away from the sites are a variety of vegetation ranging from farmbush fallows, grasslands and closed forest, but no sacred groves were observed. In all rural communities surveyed no sacred groves were encountered although it's a component of the traditional and cultural practices of the people. They are usually found in close association with the settlement and a vital symbol of traditional authority and control. The tradition, which is generic to all sites surveyed do not allow entry of any individual who do not belong to the secret society that manages these sites, to enter and/or take anything from the site. Permission to enter can only be given through the traditional authority after the performance of certain cultural rights. However, no sacred groves were found within the corridor and the core Peninsula forest.

The vegetation remained unchanged and unaltered during the rainy season surveys. The usual human activities along the edges of the road, mainly housing construction, is evident in all areas visited, and the intensity of associated development has steadily increased because the areas traversed are relatively new housing expansions around the Peninsula. This would continue for the foreseeable future and most of the vegetation within the first 500m hillside of the corridor would be lost and would be replaced by housing and associated facilities.

Specific Site Characteristics

Waterloo – Mammah Beach axis (Site 1)

This site mainly comprises open grassy areas of species *Panicum maxima*, with the few stands of trees along the road dominated by economic trees such as mango *Mangifera indica*, pawpaw *Carica papaya*, wild oil palm *Elaeis guineensis* and banana *Musa sapientum*. Most of these fruit trees, especially mangoes occur in private properties along the main road. The vegetation in areas 500 meters on the seaside end of the main road similar to that near to the road, but towards the forest, there was a relatively higher tree densities of some timber species including *Melicia regia*, *Azalia africana*, *Gmelina arborea*, *Parkia biglobosa* and *Anisophyllea laurina*. There were also patches of elephant grass *Panicum maxima* on either side of the road, with few stands of wild oil palm



Elaeis guineensis, and *Acacias* trees, The nature of the vegetation could suggest that it has been derived from a long history of slash-and-burn farming which may have degraded the soil leading to the pre-dominance of degradation tolerant trees and grasses. An inland valley swamp was encountered at Benguema, where the local people are engaged in vegetable gardening. Two quarries (Mammah beach and Kerry Town) were encountered on the forest end of the road with vegetation mainly comprising elephant grass and *Anisophyllea laurina*. A few additional herbs and ferns (especially *Selaginella* spp) were recorded during the rainy season. The vegetation was more greener during the rainy season.

Kent – Tokeh axis (Site 2)

This stretch of site has a vegetation characteristic similar to all others particularly on the seaside end of the main road. The vegetation from the road to about 500 meters is generally open and shrubby in places, mainly comprising elephant grass *Panicum maximum* and *Anisophyllea laurina*. On the side of the forest, the vegetation tends to be more forested than the Waterloo – Mammah Beach axis, with patches of degraded forest in places. However, these patches are being further fragmented by land acquisition for housing. Thus, the area is inundated by cleared land on the fringes of the forest and unfinished buildings, even in locations that



are apparently contiguous with the core Peninsula forest. The remnant tree stands include *Anisophyllea laurina*, *Daniella thurifera*, *Amphimas pterocarpoides* *Terminalia ivorensis*, *Herritiera utilis* and *Phyllanthus descoideus*. Two major streams traverse this axis of the main road; the John Obey Stream and the Big Water Stream, which are major sources of water for domestic and other uses by the local communities. Other smaller streams occur and serve the same purpose, but most of the smaller streams were drying up at the time of visit, which coincided with the dry season.

In addition to the species recorded previously, three species of mangrove were recorded on the seaside end of the corridor near the Kent Junction where a brackish water occur, namely *Rhizophora mangle*, *Rhizophora racemose* and *Avicennia germinans*; their presence was an oversight in the dry season survey. The patches of these mangroves covering about 0.3 ha are distributed along a narrow strare degraded low stands and occur at a reasonable distance from the road, along the creek leading from Bureh Town coastline. Generally, the mangrove species grow in small patches of its con specifics. Much of the sparse stands of *Rhizophora* species are found in the inner portions and the *Avicennia* towards the coastal end. The mangroves identified here covering about 0.3ha are distributed along a narrow stip along the creek leading to Bureh Town coastline and are jus scrubby patches. Most of the mangrove patches have been cut and degraded because they are exploited all the time for fuel wood and are virtually unprotected. The mangrove patches are quite distant from both new substations. It is about 5km from the Tombo substation and about 17km from the York substation. This means that the construction of the key infrastructural elements (the substations) will not affect the conservation status of the mangroves. In addition, the

mangrove patches occur at a reasonable distance from the road. The area to be traversed by the powerline is along the Kent Junction. This area would not experience much infrastructural changes from the installation of the distribution line. Therefore, the impact caused by the project is expected to be minimal. Regarding mitigation measures, one of the key measures is to avoid the left-hand-side of the road for the installation of the poles which hold the mangrove patches. Its is also important that during the installation of the poles, none should be located closed to the stream flowing into the creek.

No. 2 River – Sussex axis (Site 3)

The vegetation in this axis has similar features characteristic of the landscape that seems to be familiar to the entire western area Peninsula. The vegetation on the forest end of the road comprises widespread degraded portions of the WAPNP with remnant tree stands of species *Anisophyllea laurina*, *Daniella thurifera*, *Amphimas pterocarpoides* *Newtonia sp* *Terminalia ivorensis* and *Phyllanthus descoideus*. The degradation is associated with the acquisition of land for housing development that has been observed all around the park's buffer zones. This is particularly evident in the No. 2 River to Tokeh area. Much of the landscape comprises open areas, ongoing building construction, grasses *Andropogon gabonensis* and *Panicum maximum* in places and scattered stands of wild oil palm *E. guineensis*. On the seaside end of the road, the landscape is associated with more built-up settlements, business and fruit trees of various species (mango, pawpaw, banana etc) in private properties. The fruit trees on the forest end of the road are of similar diversity along both ends of the road. The terrain in this axis is relatively more hilly closer to the road than the two other axes described previously.



Location of Substations

A. York substation

The York substation is located on a laterite pan and so the resident vegetation is grassland dominated by the species *Pennisitum subangustum* interspersed by *Chromolaena odoratum*. The surrounding vegetation is forest on the remote end of the grass field and sparse stands of shrubs, mainly *Premna hispida*, *Anisophyllea laurina*, *Phyllocosmos africanus* and *Spondias mombin*. Adjacent to the open grass field are land spaces that have been acquired for housing development. The site looks more green in the rainy season because of the regrowth of grass mainly of species *P. subangustum*. On the seaside end of the road, shrubby vegetation dominates, with *A. laurina* and *Alchonia cordifolia* being the most common plant species.



B. Tombo substation

The Tombo substation is located at an open field surrounded by houses at various stages of construction. The area is apparently a relatively new extension of the Tombo town (towards the Peninsula forest), where the vegetation has been completely decimated and much of the land is exposed loamy soil and only young grasses of the species *Panicum laxum* are sprouting due to the rainy season. Adjacent areas are full of mango *Mangifera indica* trees and some stands of *Gmelina arborea*. There is a small stream running within 50 meters which was virtually dry in the dry season but was observed to be flowing in the rainy season.



Botanic Characteristics

The rainy season survey recorded a total of 131 species of plants belonging to 63 families (**Table 2; Appendix A**). The Kent-Tokeh corridor (Site 2) was the most diverse in terms of plant species richness, with 109 species (83.2% of the total), closely followed by (Site 3) with 100 species (76.3% of the total). Site 2 and Site 3 have relatively higher vegetation cover than Site 1, which only had 75 species (57.3% of the total). The most common tree species across all sites were *Anisophyllea laurina*, *Daniella thurifera*, *Amphimas pterocarpoides* *Terminalia ivorensis*, *Herritiera utilis* and *Phyllanthus descoideus*. Grasses of the species *Panicum laxium*, *Andropogon gabonensis* and *Pennisitum purpureum* dominated most of the degraded portions of the landscape on the seaside

end of the road and in places along the forest end. Along the edges of the road particularly within the vicinity of streams six species of ferns were recorded as follows: *Selaginella versicolor*, *S. kalbreyii*, *S. myoserus*, *Ophioglossum costatum*, *Lycopodium affine* and *Osmunda regalis*.

Four (4) species of trees recorded are in the IUCN Red List (2021) as vulnerable (VU); *Heritiera utilis*, *Azalia africana*, *Terminalia ivorensis* and *Milicia regia*; these were the same species observed during the dry season.

Table 2: Botanic categories of plant species recorded during the survey. Note that the same species of

Botanic Category	Site 1	Site 2	Site 3	Total
No. of Species	75	109	100	131
No. of Families	42	56	48	63
IUCN Red List species (VU)	1	3	2	4
No. used as food (F)	19	28	25	31
No. used as timber (T)	6	12	9	12
No. used for domestic uses (U)	17	16	15	17
No. used for wood (W)	4	5	5	7

Fauna (mammals, birds and herpetes)

Mammals

During this survey a total of eight species was recorded through interviews, signs and visual evidence across the three axes visited along the Peninsula road corridor. The common species of interest is the March Cane Rat *Thryonomys swinderianus*. **Table 2** gives a full list of the mammals identified by the local people to be present in the respective sites and their IUCN conservation status. All through the survey corridor, no chimpanzee or signs of their presence or use of the forest edges was observed. Residents who relied on the forest for a daily living commented that chimps can only be seen in a location deep into the forest.

Table 3: Mammal species recorded by visual evidence or through respondent information

Species	Scientific name	IUCN Status	Site 1	Site 2	Site 3
Green Monkey	<i>Chlorocebus sabeus</i>	LC		X	
Maxwell's Duiker	<i>Cephalophus maxwelli</i>	LC		X	X
Marsh Cane-rat	<i>Thryonomys swinderianus</i>	LC	X	X	X
Giant Pouch rat	<i>Crecitomys emini</i>	LC	X	X	X
African Civet	<i>Civettictis civetta</i>	LC			X
Stripped ground squirrel	<i>Atlantoxerus getulus</i>	LC	X	X	X
Fire-footed rope squirrel	<i>Funisciurus pyrropus</i>	LC	X	X	X
Slender mongoose	<i>Herpestess anguinea</i>	LC	X	X	X

Most of the mammal species recorded by visual evidence or interviews are presumed to be in decline in terms of their occurrence within the 500 meters range on either side of the Peninsula road corridor. From observation and anecdotal information, the rarity of mammalian fauna could be attributed to the spate of deforestation of the forest buffers and the other side of the road, mainly for housing development. Buffer zones and roadside vegetation are very important refugia for small mammals and crossing point for large foraging mammals. Seldom encounter by local people of Maxwell's Duikers *Cephalopus maxwelli* and Green Monkeys *Chlorocebus sabeus* were also reported during this survey.

Birds

A total of 110 species of birds belonging to 34 avian families was recorded across the three axes of the seventy sites surveyed (*Table 34*; Appendix B) during this season. Most of the species recorded were resident and ubiquitous (91.8%). There was a high degree of similarity in the diverse birds among the sites, except in a particular species observed during the dry season. Five species of global conservation importance was encountered (*Table 3*). Along the edge of forest at No. 2 River – Capuchin babblers *Phyllanthus atripenni* listed as near threatened (NT) by IUCN (2022). Two other near-threatened species were recorded in the core peninsula forest area visited – Rufous-winged Illadopsis *Illadopsis rufescens* (NT) and Green-tailed Bristlebill *Bleda eximia* (NT) whilst one Afrotropical migrant waterbird was recorded in Site 3 – Wolly-necked

Stork *Ciconia episcopus* (NT). Of the birds recorded, 20 species belong to the Guinea-Congo Forest biome assemblage (11.5% of the 174 species known for Sierra Leone) and two to the Sudan-Guinea savannah biome assemblage. Only three migratory species were recorded: one species of Afrotropical migrant (*C. episcopus*) and two species of Palearctic migrants.

Table 4: Bird Species on IUCN Red List in Rainy season

Species	Scientific Name	IUCN Status	Site 1	Site 2	Site 3	Core site
Hooded Vulture	<i>Necrosyrtes monachus</i>	CR		X	X	
Green-tailed Bristlebill	<i>Bleda eximius</i>	NT				X
Rufous-winged Illadopsis	<i>Illadopsis rufescens</i>	NT				X
Grey-hooded Capuchin Babbler	<i>Phyllanthus atripennis</i>	NT			X	
Wolly-necked Stork	<i>Ciconia episcopus</i>	NT			X	

Table 5 provides detailed data on the distribution of species recorded into various thematic and biogeography categories. In effect, there are limited chances of encountering savannah-dependent species. However, based on observation and the data generated, the road corridor being examined in this survey does not have a high and significant diversity of avifauna compared to the core protected area of the WAPNP. The proportion of species in all categories that were recorded along the road corridor was much less than those in the core areas of the park; but two of the five globally threatened species were recorded during this survey.

Table 5: Biogeographic and diversity information about bird species recorded

Species Category	Site 1	Site 2	Site 3	Core area	All axes	WAPNP	% of WAPNP
Number of species	91	94	93	49	110	374	29.4
Number of families	22	26	26	16	32	58	55.2
Resident species	82	83	84	49	101	327	30.9
Afrotropical migrants	5	6	6	0	7	19	36.8
Palearctic migrants	1	1	1	0	3	28	10.7
GC biome spp	14	20	17	19	23	91	25.3

UGF endemic spp	0	0	0	1	1	0	100
SG Savanna biome spp	0	0	0	1	1	5	20
IUCN Threat status Total	0	0	0	4	2	6	33.3
Critically Endangered (CR)	0	0	1	1	1	1	100
Endangered (EN)	1	0	0	0	0	0	0
Vulnerable (VU)	0	0	0	1	1	2	50
Near Threatened (NT)	0	0	0	2	0	2	0



Hooded Vulture *Necrosyrtes monochas*



Great Blue Turacco *Corythaeola cristata* (LC)

Herpetofauna (Reptiles and Amphibians)

The herpetofauna recorded in the rainy season survey corridor comprises common species as observed in the dry season. A total of 22 species of reptiles and amphibians encountered, but none were globally threatened (*Table 6*). The number of herpes recorded in the survey only represents 24.7% of the 89 species known to the National Park. The number of amphibians recorded was 12 and the increase over the dry season count is associated with the increased wet conditions that favours the breeding and foraging activities of amphibians. The most common species in the count was the African Common Frog *Sclerophrys regularis*, which had a widespread distribution and was found in almost all streams and associated habitats throughout the survey corridor. Other common species were *Ptychadena oxyrhynchus* and *Ptychadena bibroni*.

Table 6: Numbers and distribution of herpetofauna in the sites surveyed

No.	Species	Scientific Name	IUCN Status	Site 1	Site 2	Site 3
AMPHIBIANS						
1	African Common Frog	<i>Sclerophrys regularis</i>	LC	x	x	x
2	Broad-banded Grass Frog	<i>Ptychadena bibroni</i>	LC	x	x	
3	Sharp-nosed Frog	<i>Ptychadena oxyrhynchus</i>	LC	x	x	
4	Medine Grassland Frog	<i>Ptychadena pumilio</i>	LC			X
5	Ridged Frog	<i>Ptychadena mascariensis</i>	LC	x	x	X
6	African Grove-crowned Frog	<i>Hoplobatrachus occipitalis</i>	LC	x	x	X
7	Ahl's River Frog	<i>Phrynobatrachus latifrons</i>	LC	x	x	
8	West African Puddle Frog	<i>Phrynobatrachus maculatus</i>	LC	x	x	X
9	Marsh Frog	<i>Amnirana galamensis</i>	LC	x		X
10	Common toothed frog	<i>Petropedetes natator</i>	LC	x	x	X
11	West African Brown Frog	<i>Aubria occidentalis</i>	LC		x	X
12	Variable Reed Frog	<i>Hyperolius concolor</i>	LC	x	x	
REPTILES						
1	African Lizard	<i>Agama africana</i>	LC	x	x	X
2	Rainbow Lizard	<i>Agama agama</i>	LC	x	x	X
3	Greater Martinique Skink	<i>Mabouya mabouya</i>	LC		x	
4		<i>Mabouya dorsivittata</i>	LC	x	x	
5	Nile monitor	<i>Varanus niloticus</i>	LC		x	
6	Green Mamba	<i>Dendroaspis viridis</i>	LC	x	x	X
7	Black Mamba	<i>Dendroaspis polylepis</i>	LC		x	
8	African Forest Cobra	<i>Naja melanoleuca</i>	LC		x	X
9	Stripped House Snake	<i>Lamprophis lineatus</i>	LC	x	x	X
10	Gaboon Viper	<i>Bitis gabonica</i>	LC		x	X

The number of reptile species recorded was ten (10) and the most common reptiles recorded were the African Lizard *Agama africana* and the Rainbow Lizard *Agama agama*, which were observed in all habitats and sites visited. Other lizards included Greater Martinique Skink *Mabouya mabouya* and *Mabouya dorsivittata*. This is because they hide from wet and cold conditions during the rains; the latter is the only additional species of reptile recorded during the rainy season. No snakes were seen, but local people say snakes are seen more frequently in their homes during the rainy season. The movement and activities of reptiles are particularly affected by the cold and moist weather conditions in the rainy season, and so snakes were not visibly observed during this season's surveys.



Broad-banded Grass Frog *Ptychadena bibroni*



Sharp-nosed Frog *Ptychadena oxyrhynchus*



African Common Frog *Sclerophrys regularis*



Ridged Frog *Ptychadena mascariensis*



African Lizard *Agama Africana*



Rainbow Lizard *Agama agama*

AIR QUALITY ASSESSMENT

The background air quality values in this impact assessment are defined as the concentrations measured in the rainy season before the commencement of the Project activities. Air quality monitoring were made at fourteen (14) sample sites previously monitored in the dry season. The key parameters measured include particulate matter (PM), ozone (O₃), Nitrogen dioxide (NO₂), Sulphur dioxide (SO₂), carbon monoxide (CO), air temperature, and percent relative humidity. Concentrations were measured every minute for 30 minutes in the morning, afternoon, and night. These values were computed into daily averages per site.

Results and Discussions

Table 7 shows air quality testing results.

Table 7: Air Quality Testing Results

Sample	Sample Site	SO ₂ (ppb)	NO ₂ (ppb)	O ₃ (ppb)	CO (ppb)	PM _{2.5} (ppb)	PM ₁₀ (ppb)	TSP (ppb)	Temp (°C)	Humidity (%RH)	Wind Speed (m/s)	Wind Direction (°)
AQ1	Goderich Substation	129.55	47.39	9.98	0.61	9.32	12.49	15.36	28.29	81.49	1.47	200.14
AQ2	Delcon Primary School	135.17	49.55	10.58	0.79	4.36	8.32	12.30	28.66	81.69	0.88	163.57
AQ3	Bawbaw Park	148.43	44.11	14.43	0.70	8.022	15.22	21.53	28.67	80.53	1.28	215.02
AQ4	School	101.47	23.80	16.58	0.35	1.68	3.77	6.07	28.87	80.71	1.15	176.17
AQ5	York PSS	155.17	31.10	18.27	0.78	4.69	7.12	10.02	29.32	80.00	0.83	202.66
AQ6	Tombo Park	94.97	26.26	21.19	0.381	0.64	0.77	0.92	28.30	81.44	1.86	136.89
AQ7	Tombo PSS	106.32	45.91	15.58	0.33	0.97	1.99	2.87	27.69	84.35	0.97	161.82
AQ8	Buyor School	112.06	48.61	15.20	0.37	1.33	2.39	3.23	28.30	81.79	1.63	78.00
AQ9	No. 2 along main Road	137.56	40.51	16.28	0.77	7.13	10.69	13.87	28.26	81.72	1.62	128.91
AQ10	Tokeh junction	96.06	37.78	16.76	0.42	4.93	7.30	9.078	29.37	80.44	2.072	188.66
AQ11	Newly Built hospital at Tokeh	97.25	34.18	17.83	0.51	4.54	7.43	9.96	28.49	80.51	2.37	87.43
AQ12	During Town along main Road	117.16	48.02	14.61	0.43	5.26	7.71	9.62	26.63	87.70	3.43	87.48
AQ13	Hospital at Kerry town	91.38	46.78	14.89	0.30	3.64	5.86	7.74	25.96	89.42	2.33	161.12
AQ14	Macdonald along main Road	122.08	51.49	10.53	0.50	10.68	13.64	16.32	25.93	91.70	0.59	151.36

Air quality during the rainy season are considerably favourable as compared to the dry season. Nitrogen dioxide (NO₂) and Sulfur dioxide (SO₂) exceed the minimum WHO thresholds.

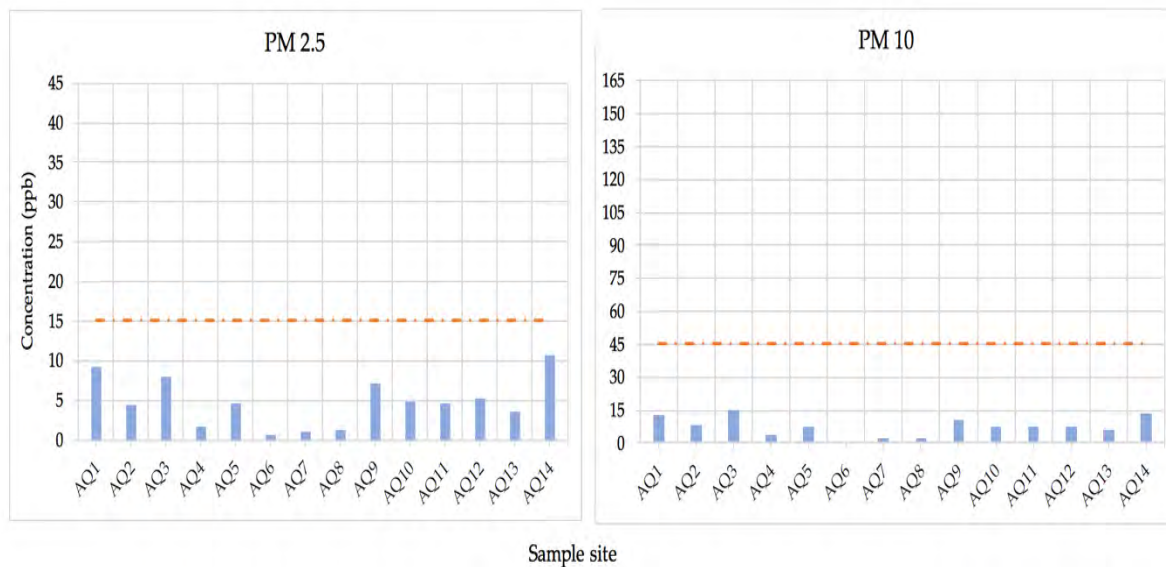


Figure 1: Particulate Matter Readings

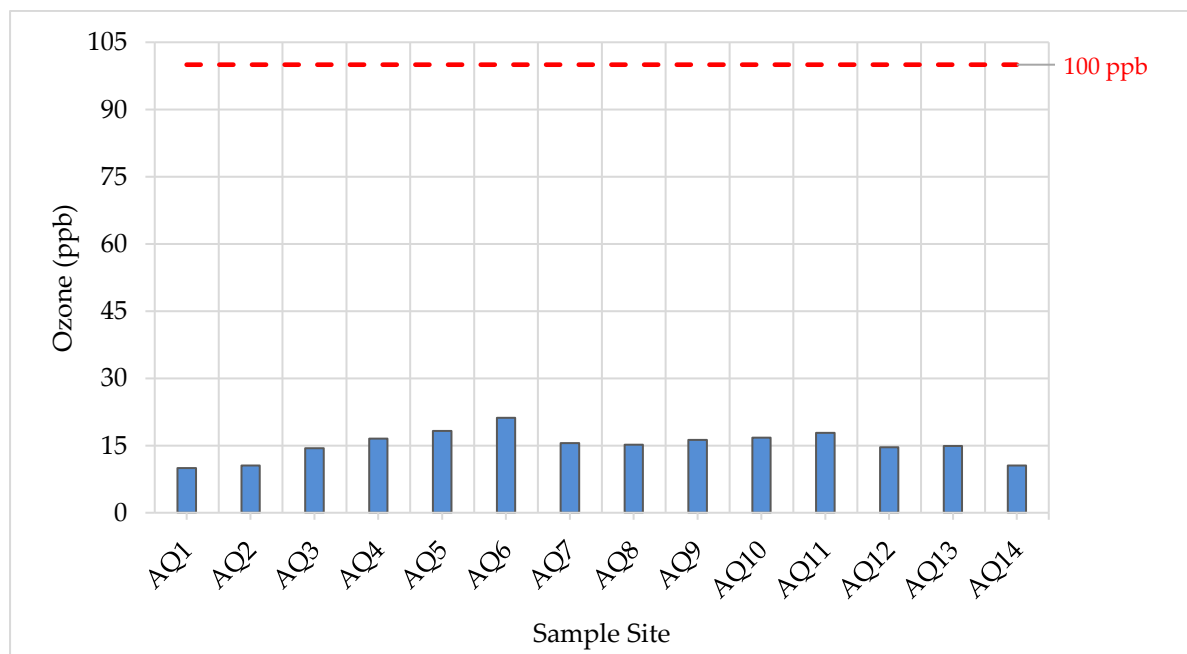


Figure 2: Ozone Readings

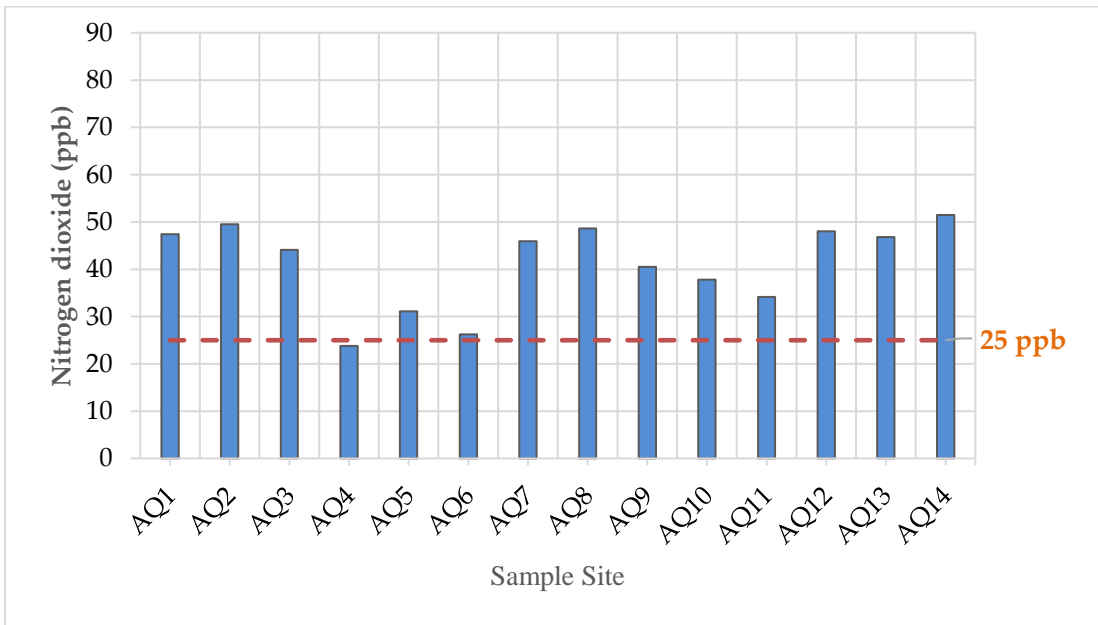


Figure 3: NO₂ Readings

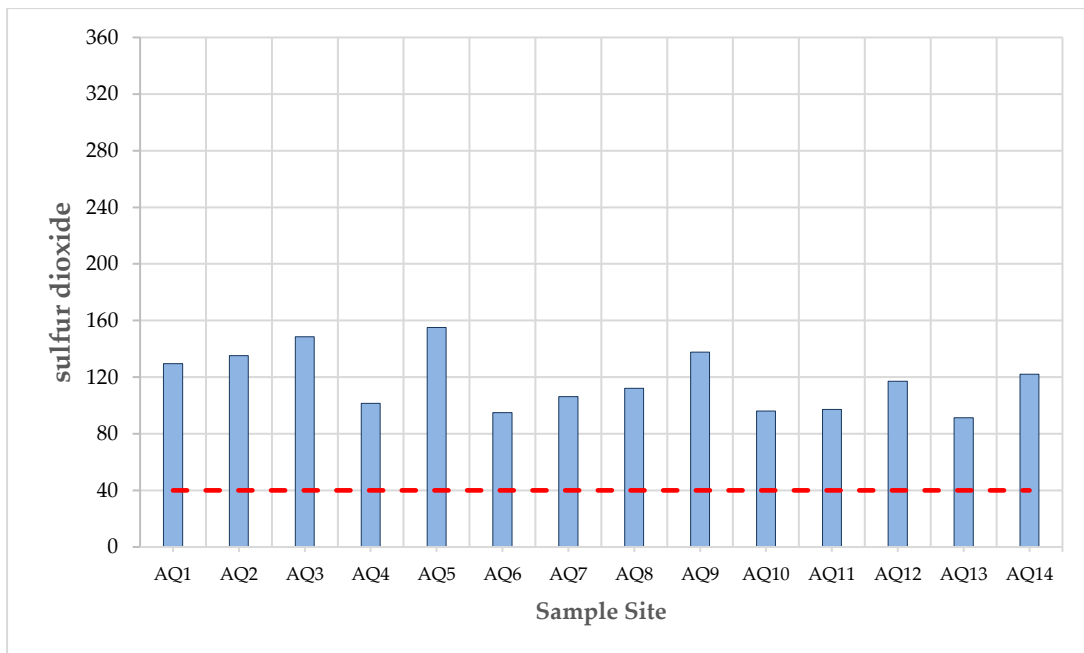


Figure 4: SO₂ Readings

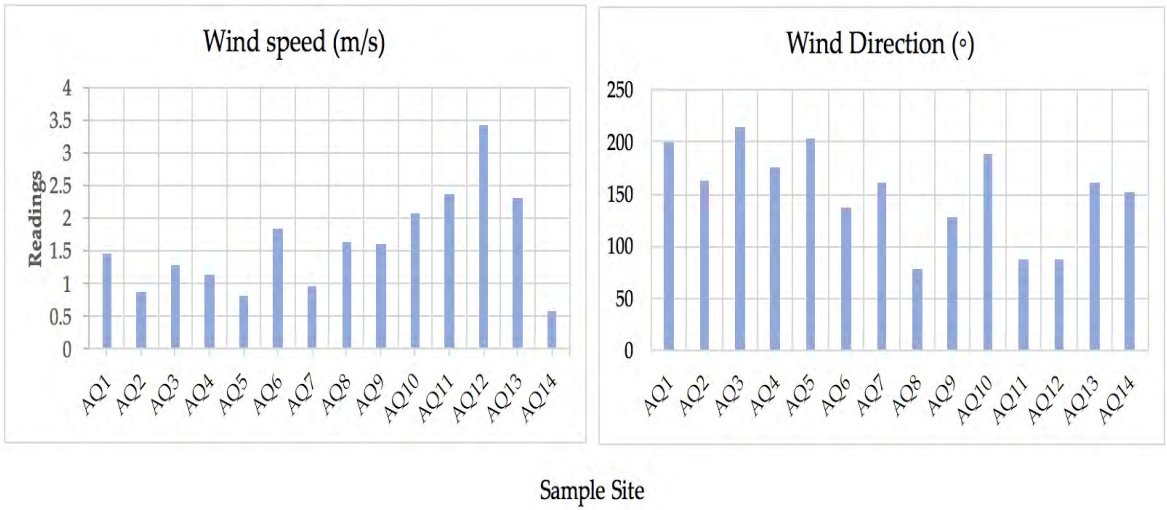


Figure 5: Wind Speed and Wind Direction Readings

WATER QUALITY ASSESSMENT

Community surface water sources were assessed for water quality testing around the proposed site. During the ESHIA study in the dry season, water samples were collected at 8 locations within the Project area. At the time of this study, in the rainy season, field crews noticed 2 seasonal streams were identified at the Tombo and York primary substations. Therefore, ten (10) samples were collected at the following locations (*Table 8*).

Table 8: Water Sample Points

No	Easting	Northing	Location
WS1	710548.19	914616.02	Kerry Town
WS2	709800.97	909172.28	Tombo
WS3	702678.25	905646.06	Kent
WS4	703509.36	911802.98	John Obey
WS5	702362.00	916911.85	York
WS6	700125.87	918733.20	Tokeh
WS7	700473.92	922240.03	No 2
WS8	696116.92	922721.91	Bawbaw
WS9	709725.95	909559.71	Tombo Primary substation
WS10	701715.19	916799.50	York Primary substation

Figure 6 is a map showing the sample points.

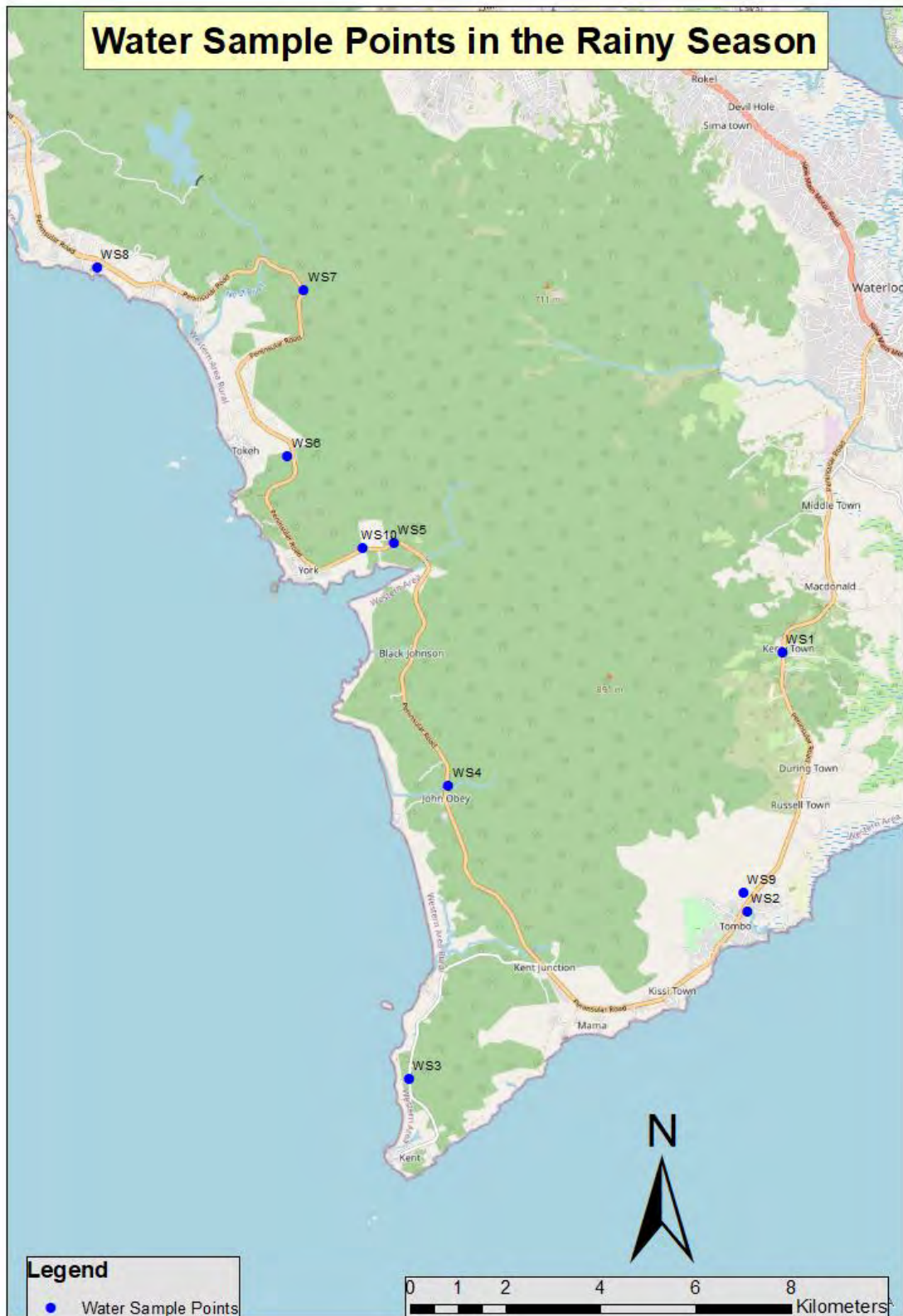


Figure 6: Water Sample Points

Methodology

Water quality samples were collected across the ten (10) surface water quality monitoring stations. Physical parameters were tested on-site, and the water samples were preserved and transported to the laboratory for chemical analysis.

Results and Discussions

Table 9 below shows the water quality testing results and WHO drinking water quality guideline target values.

Table 9: Water Quality Testing Results

No	Parameter	WS1	WS2	WS3	WS4	WS5	WS6	WS7	WS8	WS9	WS10	WHO recommended Permissible Limits
1	Water Temp (°C)	27.4	27.4	27.8	26.3	28.9	27.1	25.9	26.8	29.3	27.5	No. Value
2	PH (mg/l)	6.61	6.64	6	6.24	4.27	5.45	4.22	4.16	6.34	5.22	6.5 – 8.5
3	Turbidity (NTU)	24	54	0	0	0	0	0	0	0	0	<5.0
4	Conductivity (µS/Cm)	16	21	19	14	19	14	14	32	30	14	<500
5	DO(mg/l)	6.6	6.65	7.33	7.39	6.5	7.11	7.06	7.08	6.3	7.15	>6
6	TDS	8	10.5	9.5	7	9.5	7	7	16	15	7	<248
7	Ammonia mg/l	0.05	0.04	0.05	0.04	0.01	0.01	0.01	0.02	0.01	0.01	No. Value
8	Copper mg/l	0.27	0.25	0.23	0.32	0.29	0.32	0.23	0.23	0.13	0.4	<1.0
9	Flouride (mg/l)	0.12	0.025	0.025	0.025	0.025	0.025	0.025	0.29	0.025	0.025	<1.5
10	Iron (mg/l)	0.05	0.03	0.03	0.015	0.015	0.04	0.015	0.07	0.09	0.2	<0.3
11	Nitrite (mg/l)	0.005	0.005	0.005	0.005	0.005	0.005	0.01	0.05	0.005	0.005	3
12	Nitrate (mg/l)	0.37	0.13	0.13	0.12	0.13	0.06	0.17	0.09	0.25	0.12	<10
13	Potassium (mg/l)	0.8	0.8	1.1	0.9	0.8	0.8	0.8	0.8	0.7	0.8	<6.0
14	Orthophosphate (mg/l)	0.57	0.59	0.93	0.77	0.77	0.66	0.84	0.35	0.72	0.4	<0.035
15	Sulphate (mg/l)	2.05	5.2	5.9	2.5	2.5	2.5	2.5	18.4	2.5	2.5	<400
16	Chloride mg/l	0.005	0.8	1.5	0.6	2.8	0.25	0.6	2.8	2.4	0.6	<250
17	Chromium mg/l	0.04	0.15	0.04	0.06	0.15	0.13	0.02	0.15	0.06	0.06	<0.05
18	Zinc	0.02	0.3	0.4	0.12	0.25	0.03	0.2	0.41	0.17	0.15	<5.0
19	BOD mg/l	1.4	3.2	1.2	1.5	1	1.5	1.3	1.4	4.2	3.1	Maximum Contaminant Level (MCL) or Guidelines for Drinking water. 5 (US EPA)

Analysis of Results

1. Dissolved Oxygen

Dissolved oxygen (DO) is the oxygen available to support life in the water body; it is measured in milligrams per litre (mg/L). It is critical to the survival of various aquatic life such as fish and macroinvertebrates. The pH of water is significant because it influences nutrient solubility and availability, as well as how aquatic species utilise them. The more dissolved oxygen a body of water can hold, the colder it is. The concentration of DO in the water also influences the availability of heavy metals and nutrients. According to the WHO, a minimum dissolved oxygen concentration of 5-6 mg/L for warm waters and 6.5-9.5 mg/L for cold waters are ideal for aquatic life.

The results show that the DO for all samples collected is higher in the rainy season. The reason for the high mean DO in the rainy season is because at this time of the year, the streams flow is turbulent, and aeration occurs.

2. Turbidity

Turbidity is a measurement of water clarity. It's the quantity of light scattered in water by suspended particles. Minerals or biological stuff can be used to make it. Nephelometric Turbidity Units are used to measure turbidity (NTU). The WHO recommends that turbidity should not exceed 5 NTU for drinking water.

Only WS1 and WS2 exceed the 5 NTU guidelines. The possible cause for the higher turbidity at these two sample locations is maybe runoff. Runoff is high in the rainy season and carries sediments easily into streams. Also, the high deforestation in the Western Area is major contributor to the gradual increasing in the stream's turbidity as the cutting down of trees exposes the soil cover which is easily eroded in rainfall events.

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APPENDICES

APPENDIX A: PLANT SPECIES RECORDED ALONG THE PROPOSED DISTRIBUTION LINE CORRIDOR.

USES OF THESE PLANTS: F – FOOD; M – MEDICINE; U – UTILITY; W – WOOD; T – TIMBER.
IUCN THREATENED STATUS: VU - VULNERABLE

SPECIES NAME	FAMILY	SITE 1	SITE 2	SITE 3	USES
<i>Asystasia gangetica</i>	Acanthaceae	X	X	X	F
<i>Adiatum</i> sp	Adiantaceae	X	X		
<i>Cyathula prostrata</i>	Amaranthaceae		X		
<i>Anacardium occidentale</i>	Anacardiaceae	X	X	X	F/M
<i>Mangifera indica</i>	Anacardiaceae	X	X	X	F/M
<i>Spondias mombin</i>	Anacardiaceae		X		F/M
<i>Sorindeia jugladifolia</i>	Anacardiaceae		X		F
<i>Anisophyllea laurina</i>	Anisophylleaceae	X	X	X	T/M
<i>Funtumia Africana</i>	Apocynaceae		X	X	T/M
<i>Carpodinus dulcis</i>	Apocynaceae		X	X	M
<i>Xanthosoma sagittifolium</i>	Araceae		X	X	F
<i>Cocos nucifera</i>	Arecaceae	X	X	X	F/U
<i>Raphia vinifera</i>	Arecaceae			X	U
<i>Elaeis guineensis</i>	Arecaceae	X	X	X	F/U/ T
<i>Tridax procumbens</i>	Asteraceae	X	X	X	
<i>Chromolaena odorata</i>	Asteraceae	X	X	X	
<i>Avicennia germinans</i>	Avicennaceae	x			
<i>Newboulda laevis</i>	Bignoniaceae	X	X	X	M
<i>Bombax buonopozense</i>	Bombacaceae		X		M
<i>Plectranthus ciliates</i>	Brassicaceae		X	X	
<i>Cassia tora</i>	Caesalpinaceae	X		X	M/W
<i>Afzelia africana (VU)</i>	Caesalpinaceae		X	X	T
<i>Tamarindus indica</i>	Caesalpinaceae	X		X	F/M
<i>Dialium guinense</i>	Caesalpinaceae	X	X	X	F/M
<i>Cassia sieberiana</i>	Caesalpinaceae	X	X		M
<i>Cassia occidentalis</i>	Caesalpinaceae		X	X	M
<i>Amphimas pterocarpoides</i>	Caesalpinaceae		X		T
<i>Danielia thurifera</i>	Caesalpinaceae		X	X	T
<i>Trema guineensis</i>	Cannabaceae	X	X	X	

SPECIES NAME	FAMILY	SITE 1	SITE 2	SITE 3	USES
<i>Carica papaya</i>	Caricaceae	X	X	X	F/M
<i>Salacia senegalensis</i>	Celastraceae		X	X	F/M
<i>Parinari excelsa</i>	Chrysobalanaceae		X	X	F/M
<i>Terminalia ivorensis</i> (VU)	Combretaceae	X	X	X	T
<i>Aspilia latifolia</i>	Compositae	X	X	X	
<i>Croton hirtus</i>	Compositae	X	X	X	M
<i>Emilia coccinea</i>	Compositae	X	X	X	
<i>Bidens pilosa</i>	Compositae	X	X	X	
<i>Cnestis ferruginae</i>	Connaraceae	X	X	X	M
<i>Ipomoea trilobal</i>	Convolvulaceae	X	X	X	
<i>Ipomoea batatas</i>	Convolvulaceae	X	X	X	F/M
<i>Merremia umbellate</i>	Convolvulaceae			X	F
<i>Cucumis sativus</i>	Cucurbitaceae		X		F
<i>Cucumis sativus</i>	Curcubitaceae	X	X		F
<i>Cyperus polystachyos</i>	Cyperaceae	X		X	
<i>Kyllinga gracillima</i>	Cyperaceae	X	X	X	
<i>Cyperus rotundus</i>	Cyperaceae		X	X	
<i>Pteridium aquilinum</i>	Dennstaedtiaceae		X	X	
<i>Tetracera potatoria</i>	Dilleniaceae	X	X	X	M
<i>Dioscorea bulbifera</i>	Dioscoreaceae	X	X	X	F/M
<i>Diospyros heudelotii</i>	Ebenaceae		X		F/M
<i>Diospyros thomasii</i>	Ebenaceae		X		M
<i>Macaranga barteri</i>	Euphorbiaceae		X		W/M
<i>Anthostema senegalense</i>	Euphorbiaceae		X		M
<i>Manihot esculenta</i>	Euphorbiaceae	X	X	X	F
<i>Mareya micrantha</i>	Euphorbiaceae	X	X	X	M
<i>Phyllanthus discoideus</i>	Euphorbiaceae	X	X	X	M
<i>Alchornea cordifolia</i>	Euphorbiaceae	X	X	X	M
<i>Albizia adianthifolia</i>	Fabaceae		X	X	W
<i>Centrosema pubescens</i>	Fabaceae	X	X	X	
<i>Calopogonium mucunoides</i>	Fabaceae	X	X	X	
<i>Harungana madascariensis</i>	Hypericaceae		X	X	M
<i>Phyllocosmos africanus</i>	Ixonanthaceae	X	X	X	W
<i>Ocimum viride</i>	Labiatae			X	M
<i>Tectona grandis</i>	Lamiaceae	X	X	X	T/M
<i>Gmelina arborea</i>	Lamiaceae	X	X	X	T
<i>Clerodendrum infortunatum</i>	Lamiaceae		X	X	M

SPECIES NAME	FAMILY	SITE 1	SITE 2	SITE 3	USES
<i>Persea Americana</i>	Lauraceae	X	X	X	F
<i>Centotheca linearifolium</i>	Leguminosae	X		X	
<i>Lycopodium affine</i>	Licopodiaceae	X	X	X	
<i>Anthocleista nobilis</i>	Loganiaceae		X	X	U
<i>Anthocleista procera</i>	Loganiaceae		X		
<i>Sida stipulate</i>	Malvaceae	X	X	X	M
<i>Hibiscus columnaris</i>	Malvaceae	X	X	X	F
<i>Urena lobate</i>	Malvaceae			X	U
<i>Hibiscus sabdariffa</i>	Malvaceae		X	X	F/M
<i>Heritiera utilis (VU)</i>	Malvaceae		X		T
<i>Dissotis rotundifolia</i>	Melastomataceae		X	X	
<i>Heterocentron subtriplinervium</i>	Melastomataceae		X	X	
<i>Carapa procera</i>	Meliaceae		X		M
<i>Acacia auriculaformis</i>	Mimosaceae	X	X	X	W
<i>Acacia mangium</i>	Mimosaceae	X		X	W
<i>Dichrostachys glomerate</i>	Mimosaceae		X		M
<i>Parkia biglobosa</i>	Mimosaceae	X	X	X	F/M
<i>Mimosa pudica</i>	Mimosaceae	X	X	X	M
<i>Artocarpus communis</i>	Moraceae			X	F
<i>Milicia regia (VU)</i>	Moraceae	X	X	X	T
<i>Ficus capensis</i>	Moraceae	X	X	X	M
<i>Ficus exaspirata</i>	Moraceae	X	X		M
<i>Musa sapientum</i>	Musaceae	X	X	X	F
<i>Psidium guajava</i>	Myrtaceae	X	X	X	F/M
<i>Eucalyptus sp</i>	Myrtaceae	X		X	U
<i>Nymphaea lotus</i>	Nymphaeaceae	X			
<i>Lophira lanceolate</i>	Ochnaceae		X		T
<i>Ophioglossum costatum</i>	Ophioglossaceae	X	X		
<i>Osmunda regalis</i>	Osmundaceae	x			
<i>Cajanus cajan</i>	Papilionaceae	X	X	X	F/M
<i>Smeathmannia laevigata</i>	Passifloraceae		X	X	M
<i>Passiflora foetida</i>	Passifloraceae			X	M
<i>Axonopus compressus</i>	Poaceae	X	X	X	M/U
<i>Imperata cylindrica</i>	Poaceae	X	X	X	U
<i>Pennisetum purpureum</i>	Poaceae	X	X	X	U
<i>Andropogon gabonensis</i>	Poaceae	X	X	X	U
<i>Chasmopodium caudatum</i>	Poaceae		X	X	U
<i>Chasmopodium afzelii</i>	Poaceae		X	X	U

SPECIES NAME	FAMILY	SITE 1	SITE 2	SITE 3	USES
<i>Rottboellia cochinchinensis</i>	Poaceae	X	X	X	U
<i>Sporobolus virginicus</i>	Poaceae	X		X	M
<i>Isachne globose</i>	Poaceae		X	X	
<i>Eleusine indica</i>	Poaceae	X	X	X	M/U
<i>Zea mays</i>	Poaceae		X	X	F
<i>Bambusa vulgaris</i>	Poaceae		X	X	U
<i>Panicum maximum</i>	Poaceae		X	X	U
<i>Pennisetum macrourum</i>	Poaceae	X		X	U
<i>Rhizophora mangle</i>	Rhizophoraceae	x			
<i>Rhizophora racemose</i>	Rhizophoraceae	x			
<i>Craterispermum laurinum</i>	Rubiaceae		X	X	M
<i>Psychotria reptans</i>	Rubiaceae		X		
<i>Borreria verticillate</i>	Rubiaceae	X	X	X	M
<i>Morinda geminata</i>	Rubiaceae	X	X	X	M
<i>Mussaenda afzelii</i>	Rubiaceae		X		
<i>Flacourtia indica</i>	Salicaceae		X		
<i>Homalium africanum</i>	Samydaceae		X		W
<i>Selaginella versicolor</i>	Selaginellaceae			X	
<i>Selaginella kalbreyii</i>	Selaginellaceae	X		X	
<i>Selaginella myoserus</i>	Selaginellaceae			X	
<i>Solanum torvum</i>	Solanaceae		X		F
<i>Capsicum annuum</i>	Solanaceae	X	X	X	F/M
<i>Physalis angulate</i>	Solanaceae	X	X	X	M
<i>Sterculia tragacantha</i>	Sterculiaceae		X	X	M
<i>Cyclosorus afer</i>	Thelypteridaceae	X	X	X	
<i>Premna hispida</i>	Verbenaceae	X	X	X	M
<i>Costus afer</i>	Zingiberaceae		X		M

APPENDIX B: BIRD SPECIES RECORDED ALONG THE PROPOSED DISTRIBUTION LINE CORRIDOR.

IUCN Threatened Status: CR – Critically Endangered; VU – Vulnerable; AM – Afrotropical migrants; PM – Palearctic migrants; R – Resident species; GC – Guinea-Congo Biome species

Scientific names	English names	Site 1	Site 2	Site 3	Core Areas	Status	Biome
ACCIPRITRIDAE							
<i>Milvus migrans</i>	Yellow-billed Kite	X	X	X		AM	
<i>Gypohierax angolensis</i>	Palm-nut Vulture	X	X	X	X	R	
<i>Necrosyrtes monachus</i>	Hooded Vulture (CR)	X				R	
<i>Polyboroides typus</i>	African Harrier Hawk	X	X	X	X	R	
<i>Buteo auguralis</i>	Red-necked Buzzard	X	X	X	X	R	
<i>Kaupifalco monogrammicus</i>	Lizard Buzzard	X	X	X	X	R	
CICONIIDAE							
<i>Ciconia episcopus</i>	Wolly-necked Stork (NT)			X			
PHASIANIDAE							
<i>Francolinus bicalcaratus</i>	Double-spurred Francolin	X	X	X		R	
RALLIDAE							
<i>Sarothrura pulchra</i>	White-spotted Flufftail		X	X	X	R	GC
COLUMBIDAE							
<i>Turtur tympanistria</i>	Tambourine Dove	X	X	X	X	R	
<i>Turtur afer</i>	Blue-spotted Wood Dove	X	X	X	X	R	
<i>Streptopelia semitorquata</i>	Red-eyed Dove	X	X	X		R	
<i>Streptopelia senegalensis</i>	Laughing Dove	X	X	X		R	
MUSOPHAGIDAE							
<i>Corythaeola cristata</i>	Great Blue Turaco	X	X	X	X	R	
<i>Crinifer piscator</i>	Western Grey Plantain-eater	X	X	X		R	
CUCULIDAE							
<i>Chrysococcyx cupreus</i>	African Emerald Cuckoo	X	X	X	X	R	
<i>Chrysococcyx klaas</i>	Klaas's Cuckoo	X	X	X		AM	
<i>Chrysococcyx caprius</i>	Didric Cuckoo	X	X	X		AM	
<i>Centropus senegalensis</i>	Senegal Coucal	X	X	X		R	
CAPRIMULGIDAE							
<i>Caprimulgus inornatus</i>	Plain Nightjar	X	X	X		R	
APODIDAE							
<i>Cypsiurus parvus</i>	African Palm Swift	X	X	X		R	
<i>Apus barbatus</i>	African Black Swift	X	X	X	X	AM	
<i>Apus affinis</i>	Little Swift	X	X	X		R	
ALCEDINIDAE							
<i>Halcyon malimbica</i>	Blue-breasted Kingfisher	X	X	X	X	R	
<i>Halcyon senegalensis</i>	Woodland Kingfisher	X	X	X		R	
MEROPIDAE							
<i>Merops persicus</i>	Blue-cheeked Bee-eater	X	X	X	X	R	
<i>Merops albicollis</i>	White-throated Bee-eater	X	X	X	X	R	
CORACIIDAE							

Scientific names	English names	Site 1	Site 2	Site 3	Core Areas	Status	Biome
<i>Eurystomus glaucurus</i>	Broad-billed Roller	X	X	X		R	
BUCEROTIDAE							
<i>Tockus fasciatus</i>	African Pied Hornbill	X	X	X	X	R	GC
<i>Ceratogymna elata</i>	Yellow-casqued Hornbill (VU)		X		X	R	GC
CAPITONIDAE							
<i>Gymnobucco calvus</i>	Naked-faced Barbet	X	X	X	X	R	GC
<i>Pogoniulus scolopaceus</i>	Speckled Tinkerbird	X	X	X	X	R	GC
<i>Pogoniulus atroflavus</i>	Red-rumped Tinkerbird	X	X	X	X	R	GC
<i>Pogoniulus bilineatus</i>	Yellow-rumped Tinkerbird	X	X	X	X	R	
PICIDAE							
<i>Dendropicos fuscescens</i>	Cardinal Woodpecker	X	X	X		R	
<i>Picus canus</i>	Grey Woodpecker	X	X	X			
HIRUNDINIDAE							
<i>Psalidoprocne nitens</i>	Square-tailed Saw-wing	X	X	X	X	R	GC
<i>Psalidoprocne obscura</i>	Fanti Saw-wing	X	X	X		R	GC
<i>Hirundo daurica</i>	Red-rumped Swallow	X	X	X		AM	
<i>Hirundo lucida</i>	Red-chested Swallow	X	X	X	X	R	
<i>Hirundo rustica</i>	Barn Swallow	X	X	X		PM	
PYCNONOTIDAE							
<i>Andropadus virens</i>	Little Greenbul	X	X	X	X	R	
<i>Andropadus ansorgei</i>	Ansorge's Greenbul						
<i>Andropadus gracilis</i>	Little Grey Greenbul				X		
<i>Phyllastrephus icterinus</i>	Icterine Greenbul						
<i>Andropadus gracilirostris</i>	Slender-billed Greenbul	X	X	X	X	R	
<i>Andropadus latirostris</i>	Yellow-whiskered Greenbul	X	X	X	X	R	
<i>Chlorocichla simplex</i>	Simple Leaflove		X		X	R	GC
<i>Thescelocichla leucopleura</i>	Swamp Palm Bulbul	X	X	X		R	GC
<i>Pyrrhurus scandens</i>	Leaflove	X	X	X	X	R	GC
<i>Bleda canicapillus</i>	Grey-headed Bristlebill	X	X	X		R	GC
<i>Bleda eximia</i>	Green-tailed Bristlebill (NT)				X		
<i>Pycnonotus barbatus</i>	Common Bulbul	X	X	X		R	
<i>Nicator chloris</i>	Western Nicator	X	X	X	X	R	GC
TURDIDAE							
<i>Cossypha niveicapilla</i>	Snowy-crowned Robin chat	X	X	X		R	
<i>Stizorhina finschi</i>	Finsch's Flycatcher Thrush		X		X	R	GC
<i>Turdus pelios</i>	African Thrush	X	X	X		R	
TIMALIIDAE							
<i>Illadopsis rufescens</i>	Rufous-winged Illadopsis (NT)		X		X		
<i>Phyllanthus atripennis</i>	Grey-hded Capuchin Babbler (NT)		X	X	X		
SYLVIIDAE							
<i>Melocichla mentalis</i>	African Moustached Warbler	X	X	X		R	
<i>Cisticola erythrops</i>	Red-faced Cisticola	X	X	X		R	
<i>Cisticola lateralis</i>	Whistling Cisticola	X	X	X		R	
<i>Cisticola brachypterus</i>	Short-winged Cisticloa	X	X	X		R	
<i>Prinia subflava</i>	Tawny-flanked Prinia	X	X	X		R	
<i>Eremomela pusilla</i>	Senegal eremomela						
<i>Camaroptera brachyura</i>	Grey-backed Camaroptera	X	X	X	X	R	
<i>Camaroptera chloronota</i>	Olive-green Camaroptera		X		X	R	GC

Scientific names	English names	Site 1	Site 2	Site 3	Core Areas	Status	Biome
<i>Macrosphenus concolor</i>	Grey Longbill				X	R	GC
<i>Sylvietta virens</i>	Green Crombec	X	X	X		R	GC
<i>Hylia prasina</i>	Green Hylia	X	X	X	X	R	GC
MUSCICAPIDAE							
<i>Melaenornis edolioides</i>	Northern Black Flycatcher	X		X		R	
MONARCHIDAE							
<i>Terpsiphone rufiventer</i>	Red-bellied Paradise Flycatcher		X	X	X	R	GC
PLATYSTEIRIDAE							
<i>Bias musicus</i>	Black-and-white Flycatcher	X	X	X		R	
<i>Platysteira cyanea</i>	Common Wattle-eye	X	X	X		R	
NECTARINIIDAE							
<i>Cyanomitra verticalis</i>	Green-headed Sunbird	X	X	X	X	R	
<i>Cyanomitra cyanolaema</i>	Blue-throated Brown Sunbird	X	X	X		R	GC
<i>Cyanomitra olivacea</i>	Olive Sunbird	X	X	X	X	R	
<i>Hedydipna collaris</i>	Collared Sunbird		X	X	X	R	
<i>Cinnyris cupreus</i>	Copper Sunbird	X	X	X			
<i>Cinnyris chloropygius</i>	Olive-bellied Sunbird	X	X	X	X	R	
<i>Cinnyris venustus</i>	Variable Sunbird	X	X	X		R	
<i>Cinnyris coccinigastrus</i>	Splendid Sunbird		X		X	R	GC
<i>Zosteropes senegalenses</i>	Yellow White-eye		X	X		R	
LANIIDAE							
<i>Lanius collaris</i>	Common Fiscal	X	X	X		R	
MALACONOTIDAE							
<i>Malaconotus sulfureopectus</i>	Sulphur-breasted Bush-shrike	X	X	X		R	
<i>Tchagra senegalus</i>	Black-crowned Tchagra	X	X	X		R	
<i>Dryoscopus gambensis</i>	Northern Puffback	X	X	X		R	
<i>Laniarius turatis</i>	Turatis boubou		X	X	X	R	
ORIOIDAE							
<i>Oriolus brachyrhynchus</i>	Western Black-headed Oriole		X	X	X	R	GC
<i>Dicrurus adsimilis</i>	Fork Tailed Drongo	X	X	X		R	
<i>Dicrurus modestus</i>	Velvet-mantled Drongo				X		
CORVIDAE							
<i>Corvus albus</i>	Pied Crow	X	X	X		R	
STURNIDAE							
<i>Cinnyricinclus leucogaster</i>	Violet-backed Starling		X	X		R	
PLOCEIDAE							
<i>Ploceus nigerrimus</i>	Vieillot's Black Weaver	X	X	X	X	R	GC
<i>Ploceus cucullatus</i>	Village Weaver	X	X	X		R	
<i>Ploceus nigricollis</i>	Black-necked Weaver	X	X	X	X	R	
<i>Euplectes hordeaceus</i>	Black-winged Bishop	X	X	X		R	
<i>Euplectes macroura</i>	Yellow-mantled Widowbird	X	X	X		R	
ESTRILDIDAE							
<i>Nigrita canicapillus</i>	Grey-headed Negrofinch	X	X	X	X	R	
<i>Nigrita bicolor</i>	Chestnut-breasted Negrofinch		X		X	R	GC
<i>Lagonsticta senegala</i>	Red-billed Firefinch	X	X	X		R	
<i>Estrilda melpoda</i>	Orange-cheeked Waxbill	X	X	X		R	
<i>Spermestes cucullatus</i>	Bronze Mannikin	X	X	X		R	
<i>Spermestes bicolor</i>	Black-and-white Mannikin	X	X	X		R	

Scientific names	English names	Site 1	Site 2	Site 3	Core Areas	Status	Biome
VIDUIDAE							
<i>Vidua macroura</i>	Pin-tailed Whydah	X	X	X		R	
<i>Vidua camerunensis</i>	Cameroon Indigobird	X	X	X		R	
FRINGILLIDAE							
<i>Serinus mozambicus</i>	Yellow-fronted Canary	X	X	X		R	

APPENDIX C: PHOTO GALLERY DURING DATA COLLECTION.



Air quality monitoring



In-situ water measurements



Cross-section of Ecological team -York Primary substation

**16. Documents related to
the Land Acquisition**

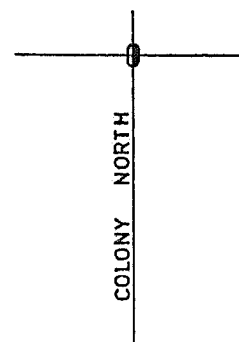
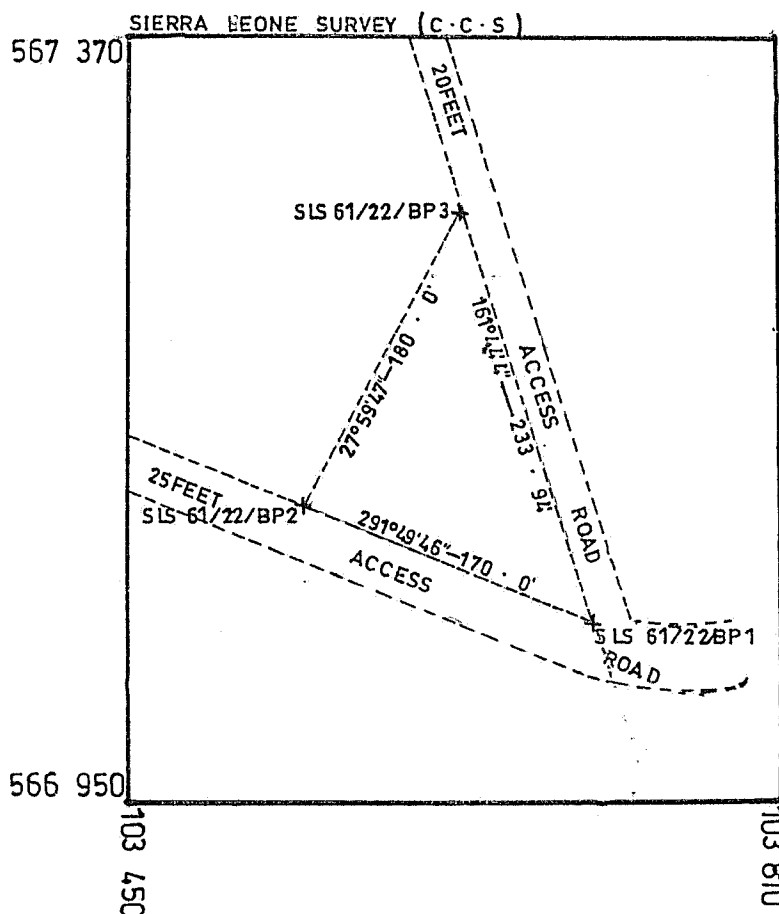
16. Documents related to the Land Acquisition

TOMBO - MADINA

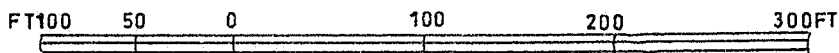
OFF PENINSULA ROAD

**STATE LAND ALLOCATED TO
ELECTRICITY DISTRIBUTION AND SUPPLY AUTHORITY (E. D. S. A.)
SHOWN EDGED RED**

AREA = 0.3492 ACRE



SCALE = 1: 1250



LOA	16588
SURVEY No	SLS 61/22
CORRESP FILE	
COMPS FILE	SLS 61/22
SURVEYED BY	BOB M KOKER
DRAWN BY	GEORGE PESSIMA
DWG OFF NO	357/22-22
CHECKED BY	<i>[Signature]</i>
DATE	26/05/22

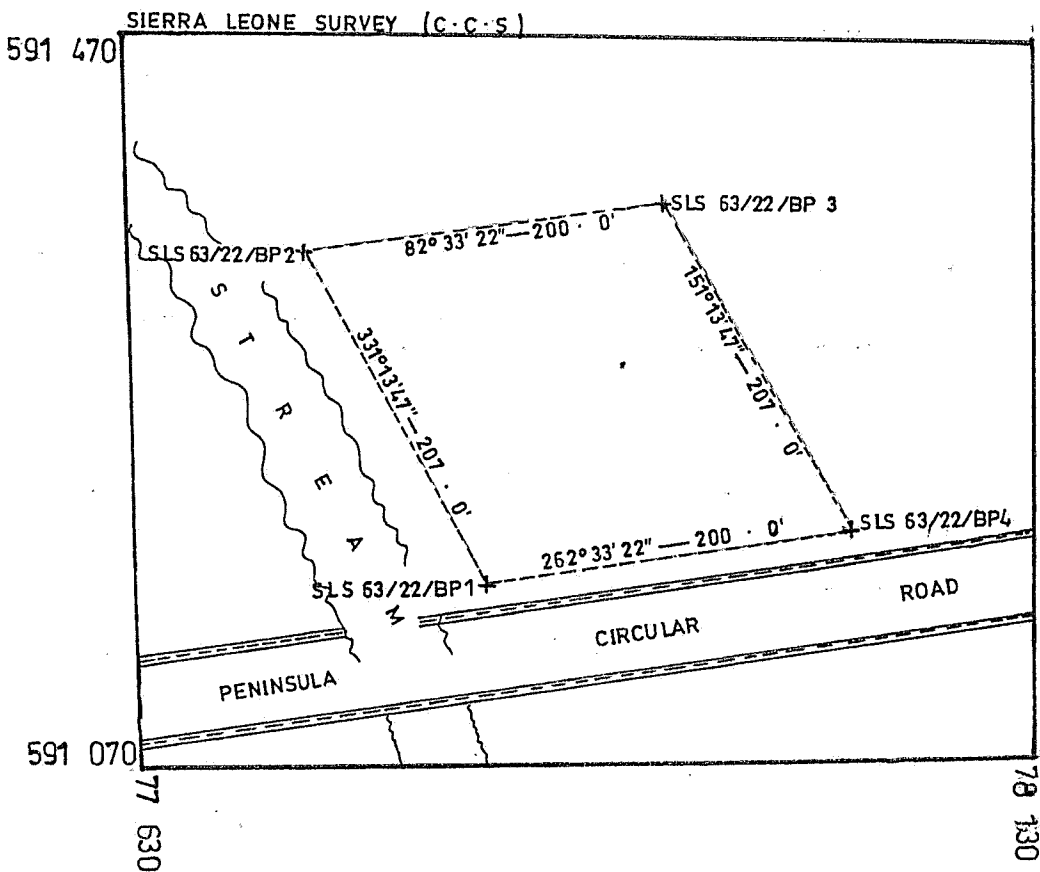
[Signature]
DIRECTOR
 SURVEYS AND LANDS DIVISION
 1st June, 2022

YORK

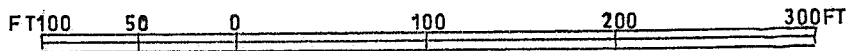
OFF PENINSULA ROAD

**STATE LAND ALLOCATED TO
ELECTRICITY DISTRIBUTION AND SUPPLY AUTHORITY (E. D. S. A.)
SHOWN EDGED RED**

AREA = 0.8785 ACRE



SCALE = 1: 1250



LOA	16590
SURVEY No	SLS 63/22
CORRESP FILE	
COMPS FILE	SLS 63/22
SURVEYED BY	BOB M KOKER
DRAWN BY	GEORGE PESSIMA
DWG OFF NO	359/22-22
CHECKED BY	<i>[Signature]</i>
DATE	26/05/22

[Signature]
DIRECTOR
 SURVEYS AND LANDS DIVISION
 1st June, 2022

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 COPY RIGHT (C) SIERRA LEONE GOVT. 2022

For York Primary Substation)



**SIERRA LEONE
ROADS AUTHORITY**
P.M.B. 1324
KISSY, FREETOWN
SIERRA LEONE

SLRA/DAM/PKIU/RAMA/01/01

Day File No. 584

June 10, 2022

Contact: Ing. Amara H.J. Kamneh
Tel: +232 76 128080
Email: saloneroads@gmail.com
Kissy, Freetown

The Director General
Electricity Distribution and Supply Authority
36 Siaka Steven Street, Electricity House
Freetown

Dear Sir,

PERMISSION FOR THE ERECTION OF ELECTRIC POLES AND CONSTRUCTION OF DISTRIBUTION LINES ON THE RIGHT OF WAY ALONG THE PENINSULA (GODERICH – TOMBO).

With reference to your letter dated 26th May 2022 requesting for permission for the subject above, a joint site visit was conducted by SLRA, EDSA and JICA to ascertain the alignment of your 33kV primary substations at York and Tombo and also the network distributions from Goderich – Kerry Town via Sussex, Tokeh, York, Kent and Tombo.

Thereafter, a resolution was unanimously accepted by EDSA and JICA that all poles to be erected on the right hand side of the road along the Right of Way shall be three meters (3m) away from the edge of the shoulder of the road on the outbound lane from Tombo.

Considering the importance of electricity distribution to the rural areas of the city, permission has been granted to EDSA to execute the above mentioned project which as a result will improve the lives of residents in those communities.

Finally, please ensure to contact SLRA for an Engineer to supervise the implementation of the project.

We count on your usual cooperation.

Yours faithfully

Ing. Amara H.J. Kamneh
DIRECTOR GENERAL

Cc: Minister of Energy
Deputy Minister of Energy
Deputy Director General - SLRA
Director of Assets Management Department - SLRA
Ag. Deputy Director General - EDSA
Distribution & Technical Services - EDSA
The Document Controller - EDSA
File

**17. Draft Abbreviated Resettlement
Action Plan (ARAP)**

Abbreviated Resettlement Action Plan

DRAFT

**For the Project of
Extension of Power Distribution System
along the Freetown Peninsula in the
Republic of Sierra Leone**



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Acronyms and Abbreviation

AIDS	Acquired Immune Deficiency Syndrom
ARAP	Abbreviated Resettlement Action Plan
EDSA	Electricity Distribution and Supply Authority
EIA	Environment Impact Assessment
EPA-SL	Environmental Protection Agency of Sierra Leone
ESS	Environmental Social Standard
ESURP	Energy Sector Utility Reform Project
ESURP-AF	ESURP Additional Finance
GoSL	Government of Sierra Leone
GRC	Grievance Redress Committee
GRM	Grievance Redress Mechanism
GST	Government Sales Tax
HIV	Human Immunodeficiency Virus
ISC	Inter-Ministerial Sub-Committee
JICA	Japan International Cooperation Agency
MoE	Ministry of Energy
NGOs	Non-Governmental Organizations
NPA	National Power Authority
PAPs	Project Affected Persons
PRSP	President's New Direction National Strategic Plan
RAP	Resettlement Action Plan
RF	Resettlement Framework
RAP IC	RAP Implementation Committee
RoW	Right-of-Way
SLRA	Sierra Leone Roads Authority
WARD	Western Area Rural District
WB	World Bank

EXECUTIVE SUMMARY

1. Introduction

1.1 Background

Concerned about the worsening electricity/energy situation in the city, in 2018, His Excellency the President's New Direction National Strategic Plan (PRSP IV) on the energy sector identified a road map to increase energy access and improve service delivery nationwide. This mandate is aligned with the Ministry of Energy's Sector Strategic Plan (2018-2030), which now embarks on an urban electrification project to extend the distribution network from Goderich to Waterloo via Sussex, Tokeh, York, Kent, and Tombo communities. The Republic of Sierra Leone Government (GoSL) requested Grand Aid for the Project for Extension of Power Distribution System Along the Freetown Peninsula in the Republic of Sierra Leone to the Government of Japan. The Government of Japan is expected to grant the Government of Sierra Leone aid to develop the distribution network along the Freetown Peninsula. On behalf of the Government of Japan, Japan International Cooperation Agency (JICA) is financing the proposed project development, and it is undertaken jointly with the Electricity Distribution and Supply Authority (EDSA) as the proponent of the Project.

This Project aims to expand and stabilize the power supply in the southwest part of the Freetown Peninsula by constructing a new substation and distribution network for poverty reduction, the stability of society, and the establishment of peace in the Freetown Peninsula. As part of the Project development procedures, risks associated with this Project's development are placed under "**Category B**" by the Environmental Protection Agency of Sierra Leone (EPA-SL) based on the assessment undertaken for the Project.

The investments under this operation, mainly the construction of distribution lines and substations, can create some displacement and land acquisition issues. Therefore, for this purpose, a Resettlement Framework (RF) following the laws of Sierra Leone, the JICA Guidelines for Environmental Social Considerations (JICA Guidelines) (2010), and the World Bank Environmental Social Standard (ESS) has been developed. This Abbreviated Resettlement Action Plan (ARAP) was prepared based on the RF and the results of asset inventory on the Project Affected Persons (PAPs) within the Project area.

1.2 The Resettlement Action Plan

In compliance with the World Bank Environmental Social Standard (ESS), an ARAP is prepared when people are physically or economically displaced from their land or other assets as a result of development projects. When displacement impacts are not substantial, i.e., when displacement impacts affect 200 PAPs or less, an ARAP is considered. The ARAP is prepared to guide the land acquisition process for this project and outlines key procedures and measures for compensating all PAPs for project impacts. The ARAP records baseline conditions of the PAPs within the project area, details potential impacts of project and consultations with PAPs. It also indicates the strategies that have been utilized to avoid or minimize impacts and compensate for losses where displacement is found to be unavoidable. When implemented properly, the ARAP should improve the standards of living and livelihoods of PAPs over and above their pre-displacement levels. The ARAP, as well as and the project's Environmental and Social Management Plan (ESMP) will be disclosed publicly and it is the responsibility of the project proponent (EDSA) to roll out disclosure plans with the support of consultants.

As some of the construction works of the Project are expected to trigger moderate adverse social impacts, JICA has requested the preparation and implementation of an ARAP prior to implementation of the Project. Accordingly, this ARAP was commissioned by the Project and is linked to the preparation of the project's RF and ESMP.

The ARAP will establish agreed procedures to value and compensate affected people for project impacts on assets and livelihoods. When impacts are not mitigated, there are risks of community opposition and conflicts which can result in project delays or stoppages and increase the project's budget.

The objectives of this resettlement plan will establish procedures and processes to:

- avoid, and where avoidance was not possible, minimize displacement through design alternatives;
- minimize social and economic impacts from displacement and restrictions access to land and business activities;
- ensure extensive consultation, information disclosure and participation of affected persons;
- restore or improve the standards of living and livelihoods of affected persons;
- extend special considerations for vulnerable PAPs and improve their livelihoods, where necessary.

EDSA will provide compensation for lost assets and temporary disruption of livelihood activities. This will be monitored over a minimum of 3 months following project implementation.

1.3 The Project

The proposed Project is located along the Freetown Peninsula. It runs from the Goderich substation through Sussex, Tokeh, York, Tombo to Kerry Town. The Project comprises the following main components (*see Table 1*).

Table 1: Project Components

No	Main Components	Quantities
1	Construction of 33kV line (Goderich SS to Tombo SS) (a) 33kV overhead line	Approx. 46km
2	Construction of 11kV line (Sussex to Medical Hospital at Kerry Town) (a) 11kV overhead line	Approx. 52km
3	Construction of 33/11kV Primary substation (a) 1x 15MVA 33/11kV Tombo substation (b) 1x 15MVA 33/11kV York substation	1 lot 1 lot
4	Construction of 11/0.4kV Secondary substation (a) 100kVA Pole-mount type (b) 250kVA Pole-mount type (c) 2x250kVA Pole-mount type (d) 315kVA Ground-mount type (e) 630kVA Ground-mount type	28 locations 6 lot 11 lot 5 lot 4 lot 2 lot

NOTE:

Macdonald and Samuel town will be supplied power from Waterloo substation
Note that contents and quantities are subject to change.

2. Project Description and Potential Impacts

This chapter contains a detailed description of key project activities and the potential risks and impacts that may be caused by the the activities. Maps showing project locations are also presented in this chapter

2.1 Impact Identification

The Project shall use the Right-of-Way (RoW) for the most part. The RoW is the parcel of land reserve between the edge of our road to the approved offset varying with the road class. This parcel of land is mainly reserved for future development, provides access for other utility companies like EDSA, and provides road users the required safety and level of service. The RoW is state-owned land, and the GoSL has vested it in the Sierra Leone Roads Authority (SLRA). Over time, the RoW has faced encroachment in the country.

The construction of 33kV and 11kV distribution lines shall be mainly constructed along existing public roads and the existing RoW. Many traders and small businesses have occupied the RoW between Goderich substation and Sussex. Options are employed so that the construction works will not affect assets during stringing along the existing line from Goderich to Sussex. There is a likelihood that the construction of new lines and secondary substations from Sussex to Kerry will affect trees along the RoW.

The land parcels for the proposed primary substation sites at York and Tombo are owned by the Sierra Leone Police and Tombo community, respectively. EDSA is in the process of acquiring those parcels of land for the Project. The land acquisition process is expected to be voluntary transactions and no displacements of persons will be involved. Therefore, the World Bank Environmental and Social Standard 5 (ESS5) may not apply to this component. However, the land acquisition process shall be screened following ESS5 requirements and probably subject to an audit. In addition, In addition, the eight criteria for voluntary land donation listed in the World Bank Involuntary Resettlement Sourcebook shall be confirmed.

Since the Project will induce displacement involving one makeshift structure at Tombo for a secondary substation construction, EDSA shall pay compensation regardless of land ownership status as per the national laws and ESS5.

3. Policy, Legal and Institutional Framework

This chapter discusses the policies, the legal and institutional framework relating to land acquisition and involuntary resettlement in Sierra Leone, and the World Bank ESS5 (Environmental and Social Standard 5) and the JICA Guidelines requirements.

3.1 Policy Framework

National Land Policy, 2015

The 2015 National Land Policy also provides for compulsory land acquisition in the public interest. The principles of the land policy include the principle of land as a common national or communal property resource held in trust for the people and which must be used in the long-term interest of the people of Sierra Leone. Such a principle only holds where it does not violate existing private ownership rights. Compensation to be paid for lands acquired through compulsory government acquisition will be fair and adequate and will be determined, among other things, through negotiations that consider government investment in the area. Local Authorities (City and District Councils) may negotiate for land for project development purposes, but all such grants should be properly documented and processed.

No interest in or right over any land belonging to an individual or family can be disposed of without consultation with the owner or occupier of the land. No interest in or right over any land belonging to an individual or family can be compulsorily acquired without payment, in a reasonable time, of fair and adequate compensation.

This Policy highlights Land distribution (acquisition and allocation), access to land by all Sierra Leoneans and investors, land tenure systems, land use planning and regulations, land management and administration systems, and land adjudication systems.

World Bank Environmental and Social Standard 5 (ESS5)

The World Bank Environmental and Social Standard 5 (ESS5) replaces the World Bank safeguard policy, OP 4.12, which forms part of the 2016 World Bank Environmental and Social Framework. The ESS5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons. Project-related land acquisition may cause physical displacement (relocation, loss of

residential land, or loss of shelter), economic displacement (loss of land, assets, or access to assets leading to loss of income sources or other means of livelihood) or both.

ESS5 applies to a bank-funded project when the displacement is caused or any loss of land or other assets resulting in:

- relocation or loss of shelter;
- loss of assets or access to assets; or
- loss of income sources or means of livelihood, whether or not the affected people must move to another location.

ESS5 applies to all components of a bank-funded project that result in involuntary resettlement, regardless of the source of financing. It also applies to other activities resulting in involuntary resettlement that in the judgement of the Bank are:

- i. directly and significantly related to the Bank-assisted Project;
- ii. necessary to achieve its objectives as outlined in the project documents; and
- iii. carried out, or planned to be carried out, contemporaneously with the Project.

ESS5 provides guidelines to project proponents on land acquisition, restrictions on land use, and involuntary resettlement. ESS5 will apply where involuntary resettlement, impacts on livelihoods and assets, acquisition of land, or restrictions to natural resources may occur due to the Project. The requirements of ESS5 includes:

- Involuntary resettlement is avoided or, when unavoidable, minimize involuntary resettlement by exploring project design alternatives;
- The Project avoids forced eviction;
- To mitigate unavoidable adverse social and economic impacts from the land acquisition or restrictions on land use by:
 - Providing timely compensation for loss of assets at replacement cost, and
 - Assisting displaced persons in their efforts to improve, or at least restore their livelihoods and living standards in real terms, to pre-displacement levels or to levels prevailing before the beginning of project implementation, whichever is higher.
- To improve living conditions of poor vulnerable persons who are physically displaced by providing adequate housing access to services and facilities, and security of tenure.
- To conceive and execute resettlement activities as sustainable development programs, providing sufficient investment resources to enable displaced persons to benefit directly from the Project, as the nature of the Project may warrant.

- To ensure that resettlement activities are planned and implemented with appropriate disclosure of information, meaningful consultation, and the informed participation of those affected.

Also, ESS5 provides eligibility criteria and it states that affected persons may be classified as persons:

- Who have formal legal rights to land or assets;
- Who do not have formal legal rights to land or assets, but have a claim to land or assets that is recognized or recognizable under national law; or
- Who have no recognizable legal right or claim to the land or assets they occupy or use.

ESS5 also addresses issues of grievances that may emerge as a result of the implementation of certain project activities. Firstly, the proponent must ensure that a grievance mechanism is in place as early as possible in the project development phase to address specific concerns about compensation, relocation, or livelihood restoration measures raised by displaced persons (or others) in a timely fashion. Where possible, such a grievance mechanism will utilize existing formal or informal grievance mechanisms suitable for project purposes, supplemented as needed with project-specific arrangements designed to resolve disputes impartially.

JICA Guidelines

According to the JICA Guidelines for Environmental and Social Considerations 2010, projects should not deviate significantly from the World Bank's Safeguard Policies which the document referred to as the benchmark standards for international financial organizations. Therefore, the World Bank safeguard policy, which has now been changed or updated to World Bank Environmental Social Standards, will be considered to be substituted for the World Bank's Operational Policies.

For the JICA Guidelines, projects that result in large-scale involuntary resettlement required a Resettlement Action Plan (RAP) to be submitted. The following are outlines for involuntary resettlement in the JICA Guidelines:

- Involuntary resettlement and loss of livelihood are to be avoided when feasible by exploring all viable alternatives. After such an examination, avoidance is proved unfeasible, effective measures to minimize impact and compensate for losses must be agreed upon with the people who will be affected.
- People who must be resettled involuntarily and people whose means of livelihood will be hindered or lost must be sufficiently compensated and supported by project proponents etc. on time. Prior compensation must be provided as much as possible at full replacement cost. Project proponents must

enable people affected by projects to improve their standard of living, income opportunities, and production levels, or at least restore these to pre-project levels. Measures to achieve this may include: Providing land and monetary compensation for losses (to cover land and property losses), Supporting means for an alternative sustainable livelihood, and Providing the expenses necessary for the relocation and re-establishment of communities at resettlement sites.

- Appropriate participation by affected people and their communities must be promoted in the planning, implementation, and monitoring of resettlement action plans and measures to prevent the loss of their means of livelihood. In addition, appropriate and accessible grievance mechanisms must be established for the affected people and their communities.
- For projects that will result in large-scale involuntary resettlement, resettlement action plans must be prepared and made available to the public. In preparing a RAP, consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. When talks are held, explanations must be given in a form, manner, and language that are understandable to the affected people. The RAP should include elements laid out in the ESS5.

3.2 Legal Framework

There are a number of legislative and regulatory instruments in Sierra Leone that are pertinent to the Project's land acquisition and resettlement activities. These are outlined below:

- National Constitution of Sierra Leone (1991): Section 21 provides guidance on protection of the fundamental rights of citizens with respect to the deprivation of private property;
- Public Lands Ordinance Law (1998): GoSL can acquire land for development purposes and provides for payment of compensation to those affected;
- Compulsory Acquisition of Property Act (1961): Section 15-20 provide guidance on appropriate mechanisms for compensation in relation to compulsory acquisition of property;
- Environmental and Social Regulations for the Mineral Sector (2013): Part IV, Sector 21 makes regulations for projects involving resettlement. It prescribes that where a project involves the potential for resettlement, the Executive Chairman of the Environmental Protection Agency (EPA) or Authorized Officer shall refer the Social Impact Assessment (SIA), the Social Management Plan (SMP) and the Resettlement Management Plan (RMP) to the appropriate authority responsible for resettlement for its consideration.

3.3 Gap Analysis: National Laws, World Bank ESS5 and JICA Guidelines

This section assesses the gaps and discrepancies between Sierra Leonean laws, the the World Bank ESS5 and JICA Guidelines. Where there is a discrepancy between national policy and the World Bank policies, under this Project, the JICA Guidelines and the World Bank's requirement will take precedence as part of the gap-filling measures in the implementation summarized in エラー! 参照元が見つかりません。

Common Principles

Generally, both the donors and the policy of GoSL support the following basic principles:

- Involuntary resettlement shall be avoided or minimized to the extent possible by incorporating social consideration into design options and alignment selections.
- Where displacement is unavoidable, i.e. people losing assets, livelihood, and other resources, shall be assisted in improving or at a minimum regaining their former status of living at no cost to themselves.

Table 2: Comparison of the Laws of Sierra Leone, World Bank ESS5 and JICA Guidelines concerning land acquisition, restrictions on land use, and involuntary resettlement.

Category	The Laws of Sierra Leone	World Bank ESS5	JICA Guidelines	Gaps filling measures under the Project
Landowners	Cash compensation based upon market value under the statute. Land for land under Customary Law	Recommends land for-land compensation of equal productive use or potential, located in the vicinity of the affected land or new sites of similar or better value plus transaction costs such as registration, transfer taxes or customary fees. Or compensation is the Market value of the equivalent area and use, with similar or improved infrastructure and services, located in the vicinity of the affected land plus all transaction costs.	Land and monetary compensation for losses (to cover land and property losses)	JICA Guidelines and ESS5 will be followed
Land Tenants	Entitled to compensation based upon land under the statute	PAPs are entitled to resettlement assistance in lieu of compensation for land, to help improve or at least restore their livelihoods.	Supporting means for an alternative sustainable livelihood and providing the expenses necessary for the relocation and re-establishment of communities at resettlement sites.	JICA Guidelines and ESS5 will be followed - Land tenants receive compensation irrespective of the legal recognition of their occupancy and any other livelihood restoration measure that will be agreed upon.
Land Users, Farmers, Gardeners	Entitled to compensation for crops and all other forms of improvements made to the land. Land for land under customary.	Entitled to compensation for crops, may be entitled to replacement land and livelihood must be restored to pre-project levels at least.	Provide the expenses necessary	provisions are almost the same. - other livelihood restoration arrangements to pre-project levels that will be agreed upon.
Owners of Non-Permanent Buildings	Cash compensation based on market value under the statute.	Entitled to in-kind compensation or cash compensation at full replacement cost including movement allowance, livelihood assistance for income loss, etc.	Land and monetary compensation for losses (to cover land and property losses)	JICA Guidelines and ESS5 will be followed
Owners of Permanent Buildings	Cash compensation based on market value.	Entitled to in-kind compensation or cash compensation at full replacement cost including labour and relocation expenses, before displacement.	Land and monetary compensation for losses (to cover land and property losses)	JICA Guidelines and ESS5 will be followed

Crops	Cash compensation based upon rates calculated as the one-year net agricultural income.	Market value for lost crops.	Provide the expenses necessary	JICA Guidelines and ESS5 will be followed - the RAP Implementation Committee (RIC) set up to handle crop compensation matters shall mediate between the parties for the farmer to accept cash compensation as per market value.
Timing of compensation payment	Prompt	Prior to displacement	At resettlement sites.	Compensation payments must be paid prior to displacement.
Calculation of compensation	Fair and adequate.	Full replacement cost	Full replacement cost	The Full Replacement Cost Approach will be adopted for the calculation of compensation. No depreciation will be considered. Full replacement cost will include labour, relocation expenses and administrative costs of legalization
Squatters	No provision for PAPs with no claim whatsoever to land. Are deemed not to be eligible and therefore not entitled to any compensation	Are to be provided resettlement assistance and compensation for lost or damaged structures, and trees or crops they planted (but no compensation for land itself)	Expense necessary for relocation.	Squatters are to be provided resettlement assistance and compensations for crops, trees and structures (but no compensation for land)
Grievances	Formal and informal mechanisms and formal access to court of law	Functional, effective, transparent and accessible grievance redress mechanisms to be established	Appropriate and accessible grievance redress mechanisms must be established for the affected people and their communities	Functional, effective, transparent and accessible grievance redress mechanisms to be established
Consultation and information disclosure	The owner/occupier of the land must be formally notified at least a week in advance of the intent to enter, and be given at least 24 hours' notice before actual entry	Displaced persons and their communities are provided timely and relevant information, consulted on resettlement options, and offered opportunities to participate in planning, implementing, and monitoring resettlement.	Consultations must be held with the affected people and their communities based on sufficient information made available to them in advance. When consultations are held, explanations must be given in a form, manner, and language that are understandable to the affected people	JICA Guidelines and ESS5 will be followed.

3.4 Institutional Framework of Land Acquisition and Resettlement

The institutional responsibilities related to land acquisition and resettlement in Sierra Leone as applicable under the Project are summarized in *Table 3* below.

Table 3: Institutional responsibilities related to land acquisition and resettlement

Institution	Responsibility
The Ministry of Energy	<ul style="list-style-type: none"> Provides general Project oversight Shall ensure that funds for the timely implementation of the RAP/ARAP are available Minister can expropriate land for energy-related projects
The Ministry of Finance	<ul style="list-style-type: none"> Relates with the central Bank to pay PAPs
EDSA	<ul style="list-style-type: none"> Primary responsibility for ARAP implementation Superintends the grievance redress process Reviews and approve compensation rates Present compensation rates to PAPs for signing off Reviews reports on the completion of compensation payments Responsible for ARAP Implementation Assign safeguards personnel to contractors Ensure that Project implementation complies with JICA Guidelines and World Bank's safeguards Report to JICA on all aspects of environmental and social management and monitoring based on the results of ARAP monitoring and take corrective measures where necessary
The Ministry of Lands Housing and Country Planning	<ul style="list-style-type: none"> Manages state land Compulsory land acquisition for development projects Prepare survey plans for EDSA in the event there is land acquisition Verify survey/title claims Participate in stakeholder consultations Validation of property valuation
The Sierra Leone Roads Authority	<ul style="list-style-type: none"> Manages RoW Verify claims on RoW Support demolition of structures on RoW
Western Area Rural District Council	<ul style="list-style-type: none"> Valuation for land compensation Involve in Project grievance redress process
Local authorities (Paramount Chiefs, Town Chiefs, opinion leaders, and councillors)	<ul style="list-style-type: none"> Responsible for local policy matters; Resolving local conflicts; Provide orderly leadership at the local level
The Ministry of Agriculture and Forestry	<ul style="list-style-type: none"> Determines rates for crop compensation
Law Officers' Department	<ul style="list-style-type: none"> Draft compensation agreements Guide grievance resolution Participate in compensation sign-off meetings
Sierra Leone Police	<ul style="list-style-type: none"> Provides security during the demolition of structures

4. Summary of Census and Socio-economic Surveys

Baseline census and socio-economic data was collected to help identify and evaluate the social impact, risks and opportunities of the Project that would help in developing mitigation measures for such impacts. Through these surveys, ownership status of all assets and earnings that will be impacted by the project will also be identified for mitigation.

4.1 Methodology

A census was conducted first to identify the number of people affected by the project and recorded up to x PAPs along the distribution line route and on the secondary substations. The census was then followed by a socio-economic study and obtained information regarding their socioeconomic conditions which will be used by EDSA to design compensation and resettlement assistance package.

4.1.1 Overview of the Questionnaire

The survey instrument used comprised 8 sections which captured information on the following themes:

- population and demographic;
- income from primary and secondary sources;
- tenure status of PAPs;
- health conditions;
- housing;
- inventory of land and structure losses;
- agriculture;
- business.

4.1.2 Data Collection and Analysis

Data collection was carried out by enumerators and supervised by senior staff after a brief explanation of the objective and importance of the survey exercise. After consent was granted by the identified PAPs, the questionnaire administration was initiated. The questionnaire which comprised 8 sections was administered to each

household head of all PAPs covering the themes mentioned above. Out of the x PAPs interviewed, y are females and z males.

The answered questionnaires were cross examined by the supervisors to make sure they are correctly filled and then were analyzed.

4.2 Ethical Consideration

The survey team observed the following ethical principles to protect and promote human rights and dignities of people affected by the project:

- voluntary participation;
- informed consent;
- maintaining anonymity and confidentiality.

All the PAPs participated voluntarily with no coercion or embellishment. Information supplied was of their volition. PAPs were informed about the data collection exercise using the questionnaire developed. Those PAPs who consented were granted the interview. Those who declined were neither forced nor threatened but were politely talked to before leaving their premises. Table 3 below is a summary of the survey results by major indicator themes.

Table 3. Summary of survey results

5. Eligibility and Entitlements

5.1 Eligibility Criteria

According to the JICA Guidelines and the World Bank ESS5, the criteria for determining PAPs eligibility are as follows:

- Those who have formal legal rights to the land or assets they occupy or use;
- Those who do not have formal legal rights to the land or assets but have a claim to land that is recognized or recognizable under national law. Communal lands usually fall in this category;
- Those who have no recognizable legal right or claim to the land or assets they occupy or use. The squatters and encroachers will fall into this category.

However, all these categories should be or have their assets or interest in the Project area before the cut-off date is announced.

Any person who suffers a loss of, or damage to an asset or loss of access to productive resources or restricted access (temporarily), as a result of the carrying out of the Project for the extension of power distribution system, will be considered eligible for compensation and/or resettlement assistance provided the damage or loss is induced by the Project and satisfies the conditions of eligibility including the cut-off date.

The eligibility will be based on the category of losses at the cut-off date identified through the various interest and rights derived from common law and international conventions and in specific cases as agreed with the affected community. Eligible persons would include, but not be limited to, those listed in *Table 4*.

Table 4: Type of Loss and Eligible Persons

Type of Loss	Eligible persons
Loss of Land	Various interest and rights – allodial titleholder, usufruct, freeholder, leaseholder, tenant, licensees
Loss of Structure	Various interests and rights – freeholder, leaseholder, etc.
Business Losses	
Loss of business income	Business owner/operator
Loss of business goodwill	Business owner/operator
Loss of rent income	Landlord/Lessor
Loss of wage income	Business employees/attendants
Loss of fees from trainees or apprentices	Trainer/Person offering apprenticeship job training

Loss of Business, Residential or Industrial Accommodation or Room	Residential/Commercial/Industrial Tenant Owner of a building during the reinstatement period
Loss of location for a temporary structure	Owner of a temporary structure
Loss of training or apprenticeship	Apprentice/Trainee
Loss of economic or perennial trees Loss of food crops Loss of grazing land	Various rights and interest holders – farm owner, Sharecroppers, Licensees, Lessees

5.2 Cut-off Dates/Moratorium

A cut-off date is designed to serve as cut-off period for a project’s obligation to compensate affected, eligible assets, and is based on proper disclosure. In another sense, it is the closing of the database of identified PAPs to establish a limit to eligibility. EDSA will gazette the cut-off date in parliament.

People who would occupy the ROW after a cut-off date is established are not eligible for compensation and/or resettlement assistance, but it should be noted that there is a limit to which a cut-off date can prevent people from developing their properties. When a project is significantly delayed the survey results will become outdated.

The following steps were taken to declare a cut-off date for the project:

The cut-off date was established by the RAP team as xrd July 2022 for all the communities. This was done in conjunction with EDSA, making anyone who makes a claim for loss of land or any assets after such a date ineligible for expropriation/compensation. This was in addition to the process of valuation that established a cut-off date directly for PAPs at an individual level during asset registration.

The cut-off date strategy included the following measures:

- cut-off date handout bearing grievance redress procedure given to PAPs during meetings;
- A0-A1-A4 sized posters on the cut-off date, the GRM, and Engineering design were displayed at the community meetings and were later given to Councilors to paste at the community centers of affected communities. While the A0 and A1 poster were pasted at the community centers, the A4 illustrations were given to PAPs as hand outs and take away;
- consultation with local leaders, Chiefs and Headmen, WARD Counsellor and relevant organizations (XX Organization) within the project area.

5.3 Eligibility and Entitlement

Table 5 presents the eligibility criteria and entitlement matrix for the general categories of impacts. The resettlement/livelihood plan for this Project will only consider impacts applicable to the Project.

Table 5: Eligibility criteria and entitlements

Affected Assets	Type of impact	Entitled units	Eligibility criteria	Entitlement
Land	Permanent acquisition of land, i.e., leasing of land	Landowner (individual, family, community/stool)	Owns the affected plot of land under Sierra Leone laws, including customary	<ol style="list-style-type: none"> 1. Land for land (of equivalent productivity, location advantages, and acceptable to PAPs) including transaction cost, transfer taxes, etc. or 2. Cash compensation as agreed among the parties via negotiation or prevailing market rates.
	Temporary occupation of land	Landowner (individual, family, community)	Owns the affected plot of land under Sierra Leone laws, including customary	<ol style="list-style-type: none"> 1. Compensation (in cash or kind) for the period of occupation as agreed among the parties via negotiation.
	Renters	Renter (Individual, family)	Rent land for farming, business or any livelihood activities etc	Are entitled to resettlement assistance in lieu of compensation for any improvement or undertaking on land, to help improve or at least restore their livelihoods
Crops (food/cash crops and economic trees inclusive)	Destruction of/damage to standing crops	Owner or Farmer	Have grown the affected crop (regardless of related plot ownership)	<ol style="list-style-type: none"> 1. Cash compensation for standing crops counted at the valuation date and based upon updated market rates, and 2. Disturbance allowance of 10% of (1)
Structures	Destruction of immovable structures	Owner - permanent	Owns affected structure	<ol style="list-style-type: none"> 1. Compensation at full replacement cost (no depreciation) of structure, including the cost of registration, transfer taxes 2. right to salvage

Affected Assets	Type of impact	Entitled units	Eligibility criteria	Entitlement
		Occupant - permanent	Live in or use the affected structure on a rental basis (Occupant different from owner)	3. Cost of moving (e.g. persons/ goods in the structure under or belonging to the owner) 4. Disturbance allowance of 10% of (1) 1. Cost of renting a similar structure (e.g. for 6 months duration) 2. compensation for any non-movable asset at full replacement cost 3. Cost of moving out to a new place 4. Disturbance allowance of 10% of (1)
	Structure - temporal	Owner and occupant	Lives or use structure but may be restricted access due to Project operations though the structure itself may not be affected	1. Alternative route for ease of access 2. Disturbance allowance as negotiated with the PAP
	Relocation of movable structures	Owner	Owns the affected structure	1. Cost of moving affected structure to a new site 2. Disturbance allowance of 10% of (1)
		Occupant	Use or occupies the affected structure	1. Cost of moving occupants to a new site 2. Disturbance allowance of 10% of (1) [NB: if the owner is the same as the occupant, he/she will not be entitled to this disturbance allowance].
Livelihoods	Agriculture - the destruction of economic or cash crops	Farmer	Use affected land for farming as livelihood sources (emphasis on perennial crops. Annual crops can be harvested)	1. Cash compensation for any temporary loss of income or livelihood incurred as a result of the project during the transition period (period required to re-establish farm at a new location agreed upon).

Affected Assets	Type of impact	Entitled units	Eligibility criteria	Entitlement
			<p>prior to land entry or destruction)</p>	
	<p>Businesses</p>	<p>Business person (may be distinct from owner of a structure where business takes place)- permanent loss</p>	<p>Operate a business on Project affected land, regardless of the land ownership situation (includes squatters)</p>	<ol style="list-style-type: none"> 1. Compensation of structures at full replacement value. 2. right to salvage materials 3. cost of moving to a new location 4. Disturbance allowance of 10% of (1)
		<p>Business person (may be distinct from owner of a structure where business takes place)- temporal loss</p>	<p>Operate a business on Project affected land, regardless of the land ownership situation (includes squatters)</p>	<ol style="list-style-type: none"> 1. Cash compensation of temporary loss of income and livelihood based on daily income and duration works before re-establishment of the business to pre-Project conditions.
	<p>Use of communal resources</p>	<p>The user of such resources (can be individuals or communities)</p>	<p>Use communal resources as an element of livelihood</p>	<ol style="list-style-type: none"> 1. Assistance in identifying and accessing similar resources elsewhere 2. Cash compensation of temporary loss of income incurred because of the Project during the period required to access similar resources elsewhere/period required to provide alternative livelihood assistance

6. Approach and Procedure for Valuating Assests

6.1 The Process of Valuation Inspection/Referencing

Key points that the valuation will cover are as follows:

- i. Collection of all relevant primary and secondary data on the affected property during final detailed valuation inspection and referencing to serve as the basis for assessment of loss; and
- ii. A comprehensive primary database for monitoring, evaluation and audit.

Some relevant data to be captured by the valuer will be:

1. For Land
 - Capture location details of the land
 - Identify the boundaries of the area/section of the land to be affected.
 - Take detailed measurements of the land area to be affected along the affected boundaries.
2. For Buildings (Immovable Structures)
 - Photograph all affected immovable properties
 - Precise internal measurement of buildings should be done
 - Collate property details which will include noting affected accommodation details, constructional details of affected parts and external works (fence walls, gates, pavements), affected owner's details, etc.
3. For Temporary Structures (Movable Properties)
 - Collate data on temporary structures by categorizing temporary structures based on constructional details (wall materials, affixed to concrete slabs or not), size of the structure and use of structure (business/residential) and type of business.
4. Intangible Assets (loss/impact arising from disturbance)
 - Obtain relevant data on households affected (tenants, owners, relatives), apprentices/trainees and determine intangible loss on households, businesses and livelihoods.
5. For Crops
 - During the inspection and enumeration exercise, details such as type, age, stage of growth, size of farm (or the number of crops for isolated economic/perennial trees), nature of the farm, etc. should be captured.

6.2 Identification and Categorization of Loss and Impact

PAPs should be identified by the types of losses they suffer or the project's impact on them. PAPs should not be limited to renters, tenants, farmers, and others who don't own their housing/field/etc. but will be displaced. The resettlement consultant will:

1. Ensure that identification and categorization of the likely loss or impact is undertaken during the planning and design stages of the project;
2. Establish the magnitude and coverage of impacts early in the project planning to justify adopting the resettlement instrument. A general categorization of losses will be done to reflect the extent of loss in terms of the following:-
 - Permanent or Temporary Loss;
 - Full or Partial Loss;
 - Minimal or Significant Loss.
3. Determine specific losses or impacts to reflect the exact nature of loss, whether visible and tangible or intangible and categorize into the following losses: -
 - Physical loss of assets which will be determined by assessing the interest or right to ownership, occupation and possession;
 - Loss of income, loss of livelihood and opportunities to employment; and
 - Impacts arising from disturbance/disruptions.

6.3 The Basis and Method of Valuation

The valuation basis would comply with the JICA Guidelines and the World Bank ESS5. Compensation will be assessed and granted at Full Replacement Cost. The methods for valuation for the various losses are presented in *Table 6*.

Table 6: Method of Valuation

Type of Loss	Method of Valuation	Basis
Loss of land	Land for land of equal productive use or potential, located in the vicinity of the affected land or new housing site plus the cost of preparation to levels similar to or better than those of the affected land, and transaction costs such as registration and transfer	Based on the market value of comparable recent land transactions

	taxes. or comparative sales method	
Loss of buildings (any type of structure, e.g., mud houses, wooden structures, sandcrete block houses, public buildings etc)	Replacement cost method or comparative sales method (whichever gives a commensurate value)	Full replacement cost value as if new – recent construction cost rates. No depreciation will apply.
Loss of trees, perennial crops, food/ cash crops	Comparative sales method/ replacement cost method	Based on ongoing market rates. Crop rates will consider the stage of the crop and the number of years to maturity before such trees will begin to generate income, including the cost of labour and equipment invested in crop cultivation.
Loss of business income and loss of business goodwill	Comparative method	Based on the average monthly net profit
Loss of income from rent and expenditure incurred for alternative accommodation during the reinstatement period	Comparative sales method	Based on the comparable rent passing, rent advance paid
Expenditure incurred for transfer of chattels, movable properties and temporary structures	Comparative method	Based on truck/ transport hiring charges
Loss of wages Loss of fees from apprentice Loss of Job training	Comparative method	Estimated income of the business or daily sales of the business; and Estimated period of construction which will disrupt business or commercial activity. Losses of income for businesses will be estimated from net monthly/annual profit of the business verified by an assessment of visible stocks and activities.

Loss of access to natural resources	Access to similar resource elsewhere taking into consideration impacts at the alternative location. Cash compensation at replacement cost when it is demonstrated that there is no feasible alternative measures available.	Full replacement cost
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6.4 Consideration for Vulnerable Groups

6.4.1 Identification of vulnerable groups

Vulnerable groups are those at risk due to the displacement, compensation, and resettlement process. There may also be some PAPs who are already vulnerable based on their existing conditions such as poor health, disability, old age, etc., project impact could worsen their condition. During the census, the project should identify such persons for the resettlement/livelihood plan. In preparing the resettlement/livelihood plan, the following categories of PAPs shall be given special considerations:

- The elderly, usually from 70 years and above;
- Widows, Women and children;
- Physically challenged persons;
- Mentally challenged/highly depressed persons;
- Affected Persons who are too ill, bedridden, hospitalized or stricken with HIV/AIDS;
- Unemployed youth;
- Female-headed households; and
- Migrant without proper land documents.

6.4.2 Assistance to vulnerable persons

Assistance to vulnerable persons will be outlined in the resettlement/livelihood plan following the census and may take various forms depending on the circumstance of their vulnerability and needs. Assistance to vulnerable people may include but not limited to the following:

Similar to all PAPs, assistance in financial literacy training, especially for women and assistance in compensation payment procedures (e.g. going to the bank with them to cash the compensation cheque);

- Assistance in the post-payment period to secure the compensation money and reduce risks of misuse/robbery;
- Assistance in moving: providing vehicle, driver and assistance at the moving stage;
- Where compensation is determined in-kind payment, vulnerable persons should be paid in cash if they so desire;
- Access to Health insurance and assistance to medical facilities for critically ill PAPs.
- Moving and rent subsidy for the transition period.

7. Community Participation

7.1 Objectives of Stakeholder Engagement and Information Disclosure

The World Bank ESS10 provides the following objectives of the Stakeholder Engagement and Information Disclosure process:

- To establish a systematic approach to stakeholder engagement that will help borrowers identify stakeholders, build and maintain a constructive relationship with them, in particular, Project-affected parties;
- To assess the level of stakeholder interest and support for the Project and to enable stakeholders' views to be taken into account in Project design and environmental and social performance;
- To promote and provide means for effective and inclusive engagement with Project-affected parties throughout the Project life cycle on issues that could potentially affect them;
- To ensure that appropriate Project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible, and fair manner and format;
- To provide Project-affected parties with accessible and inclusive means to raise issues and grievances and allow borrowers to respond to and manage such grievances.

7.2 Stakeholder Engagement and Participation Strategy

The key elements of the stakeholder engagement and information disclosure strategy for the Project will include the following:

- i. disclosure of important Project related information by the implementing agencies on its website and at the appropriate local level and other disclosure procedures agreed with JICA;
- ii. a framework for consultation with the key stakeholders including the affected communities, important local leaders and energy user groups (e.g., local business associations) during planning, design and implementation of the Project;
- iii. ensuring free, prior, informed consultation with the affected communities and key energy user groups and their representatives for obtaining broad community support;

- iv. the establishment of a GRM at the national and Project site levels (to be managed by EDSA in concert with WARD Council) to meet specific grievance redress requirements of operations/Project.
- 7.4 Stakeholder Engagement during Preparation of Resettlement Framework

8. Monitoring and Evaluation

The monitoring arrangements are intended to track the resettlement/livelihood implementation performance and will consist of both internal and external monitoring. The MoE will have the overall responsibility for Project coordination, monitoring, and reporting on results achieved in the Project.

8.1 Internal Monitoring and Reporting

Internal monitoring of the resettlement/rehabilitation operations will be undertaken by EDSA following the schedules (including identification of PAPs, land acquisition, compensation of PAPs, and how these PAPs have participated in the Project resettlement preparation and implementation) to be outlined in the resettlement/livelihood plan. The Environmental and Social Management Unit of EDSA is primarily responsible for monitoring resettlement activities. However, the Supervising Engineers will conduct the day-to-day field supervision and capture in the monthly and quarterly progress reports subject to review by EDSA. EDSA will produce quarterly reports for the MoE and JICA.

8.2 External Monitoring and Reporting

The Project shall incorporate external monitors. Independent monitoring shall be commissioned for the Project. Civil Society Organizations (CSOs) are often suitable for such task. The independent monitor shall monitor engagements with the PAPs until compensation payments are made and the demolition of affected properties is concluded. This task will be carried out in parallel with implementing the resettlement/livelihood activity.

As part of promoting greater community participation and involvement in the Project and encouraging a sense of ownership, the local council (WARD Council) and Project communities should be involved in monitoring resettlement implementation. For this purpose, they need to be adequately sensitized on land issues and transfer procedures and conditions governing such transfers. This will create a better understanding of the land issues related to the Project.

The monitoring system will:

- Inform the Environmental and Social Management Unit of EDSA on the progress and performance of the land acquisition;

- Number of households enrolled for the livelihood restoration program
- Document timely completion of the Project resettlement obligations for all permanent and temporary losses, as well as unanticipated, additional construction damages;
- Status of ongoing income restoration activities;
- Number of vulnerable households supported during the transition period; and
- Records on grievances received, number of grievances resolved, number of grievances pending resolution, number of Project grievances escalated and forwarded to the Law Court;

8.3 Monitoring Indicators

While taking lead responsibility, MoE and the Environmental and Social Management Unit of EDSA shall track the preparation and implementation of the Resettlement/livelihood plan. They shall closely monitor the following indicators as shown in *Table 7*.

Table 7: Sample Resettlement/Livelihood Monitoring Indicators

No.	Monitoring	Specific Indicator	Frequency
1.	Social and Economic Monitoring	Provide the number of PAPS: i) Whose livelihoods have been restored to pre-Project level, ii) whose livelihoods have improved beyond the pre-Project level, iii) whose livelihoods are worse than the pre-Project level	Monthly until the end of Resettlement/Livelihood implementation
2.	Private Structures	Provide the number of PAPS: i) whose livelihood has been restored to pre-Project level, ii) whose livelihoods improved beyond the pre-Project level, iii) whose livelihood are worse than the pre-Project level	Monthly until the end of Resettlement/Livelihood implementation
3.	Public Structures	Provide the number of PAPS: i) whose livelihoods have been restored to pre-Project level, ii) whose livelihoods have improved beyond the pre-Project level, iii) whose livelihoods are worse than the pre-Project level	Monthly until the end of Resettlement/Livelihood implementation

No.	Monitoring	Specific Indicator	Frequency
4.	Economic Crops	Track progress on: i) number and type of economic crops planted by affected farmers, ii) number of farmers who have restored their income to pre-Project level, iii) the number of farmers who have not restored their income to pre-Project level, iv) the number of farmers whose income has been restored beyond the pre-Project level, v) the number of affected farmers who have changed their livelihoods from farming to other livelihood activities.	Monthly until the end of Resettlement/Livelihood implementation
5.	Assistance to Businesses	Track progress on: i) number of affected businesses that have resumed business operations, ii) number of businesses that have restored net income to pre-Project levels, iii) number of businesses that have restored their net income beyond the pre-Project level, iv) number of affected businesses that have not resumed operations	Monthly until the end of Resettlement/Livelihood implementation
6.	Vulnerable Groups	Provide the number of vulnerable PAPs: i) whose livelihoods have been restored to pre-Project level, ii) whose livelihoods have improved beyond the pre-Project level, iii) whose livelihoods are worse than pre-Project level, iv) who have received assistance from the special package, v) who are sick and who benefitted from health service in the Project area, vi) the number of disabled-friendly facilities constructed by the Project such as access ramps from the main road to their living quarters or neighbourhood.	Monthly until the end of Resettlement/Livelihood implementation
7.	Tenants	Provide the number of affected tenants: i) who have found new rental places, ii) who reported that the rental allowance is inadequate, iii) who showed satisfaction	Monthly until the end of Resettlement/Livelihood implementation

No.	Monitoring	Specific Indicator	Frequency
		over their new rental places compared to the ones they occupied before the Project, iv) the number of tenants who have not yet found rental places.	
8.	Grievances and grievance management system	Track grievances and report: i) number of cases at each impact location, ii) the number of cases resolved, iii) number of cases pending, iv) reasons for pending cases, v) frequency of GRM meetings, vi) description of compliance to GRM procedures	Monthly until the end of Resettlement/Livelihood implementation

8.4 Evaluation (Completion Audit)

An audit will be done to determine whether the efforts to restore the living standards of the affected population have been adequately designed and executed. This completion audit will verify that all physical inputs earmarked in the Resettlement/Livelihood have been delivered and all services provided. The audit will also evaluate if the mitigation actions prescribed in the Resettlement/Livelihood plan have had the desired effect. The baseline conditions of the affected parties before the relocation will be used as a measure against their socio-economic status after the resettlement.

The exercise shall provide the feedback needed to adjust the resettlement/livelihood plan and take corrective action. The evaluation shall have the following specific objectives:

- General assessment of the implementation of resettlement activities;
- Examine compliance of the implementation of resettlement activities with national laws, regulations, JICA Guidelines and World Bank ESS5;
- Assessment of resettlement and compensation procedures as outlined in the RF and ESS5;
- Evaluation of the impact of the resettlement and compensation programs on PAP incomes and standards of living, with focus on the “no worse-off if not better-off” requirement;
- Identify actions to be taken as part of the ongoing monitoring exercises to improve resettlement/livelihood implementation.

9. Grievance Redress Mechanism

9.1 Introduction

A systematic and functional Grievance Redress Mechanism (GRM) should be adopted to address the concerns of PAPs and other residents. Such a mechanism should detail the processes involved in registering grievances at no cost to the PAPs. In the context of this RF, a grievance could mean a simple query or inquiry, concern, issue, or formal complaint that bothers or disturbs the lives of PAPs. The levels of the GRM should be well publicised as a way of educating PAPs and other residents on the process. However, alternative means of access will be the public information centres that will be established at various Project communities. At the same time, information about where complaints can be lodged shall be incorporated into all compensation and/or livelihood restoration agreements. There is a wider public understanding and acceptance of the mechanisms proposed for grievance redress. Similar information will be published on public notice boards communicated verbally at all public meetings and outreach sessions.

9.2 Rationale for GRM

The primary purpose of the GRM is to hear the complaints or address the concerns of PAPs and related communities to a fair extent and on time. Dissatisfaction can cause an aggrieved PAP or resident to act beyond expectations, culminating in some unforeseen repercussions that would negatively affect Project implementation and stall Project progress. Consequently, the GRM proposed for this Project seeks to achieve the following objectives:

- Encourage registration, acknowledgement, and recording of all concerns or issues raised by the PAPs or stakeholders;
- Identify the frequencies of issues raised: for instance, unpaid compensation, inadequate compensation, disregard for local ritual ceremonies, land acquisition and many more;
- Ensure that complaints are appropriately registered, tracked and documented, with due regard for confidentiality;
- Address the composition of a committee that would handle all grievances;
- Inform people of the public information centre establishment and access;
- Establish procedures for the GRM to enhance easy access, transparency and accountability, and tackle escalation of grievances beyond expectations;

- Manage the concerns raised by PAPs to achieve a win-win situation within a reasonable timeframe that would comply with national and international best practices; and
- Record all resolutions agreed upon by all parties involved and ensure that aggrieved persons are satisfied with every outcome of remedial resolution to foster harmony in the Project's implementation.

9.3 GRM Institutional Framework

A functional Grievance Redress Mechanism (GRM) exists within EDSA for the ESURP and ESURP-AF Projects. Residents within the Project area (Western Area) are very convenient with its procedures. Therefore, it is advisable to adopt the same structure for this Project.

This GRM is very systematic and functional to address the concerns of PAPs. Such a mechanism details the processes involved in registering grievances at no cost to the PAPs. The levels/tiers of the GRM shall be well publicised to educate PAPs and other residents on the process. However, alternative means of access will be the public information centres that will be established at the councillor's office. At the same time, information about where complaints can be lodged shall be incorporated into all compensation and or livelihood restoration agreements so that there is a wider public understanding and acceptance of the mechanisms proposed for grievance redress. Similar information should be published on public notice boards communicated verbally at all public meetings and outreach sessions.

The grievance redress process shall follow the following principles:

- **Simplicity:** procedures in filing complaints are understandable to users and easy to recall;
- **Accessibility:** filing complaints is easy through means that are commonly used by stakeholders, especially by the PAPs;
- **Transparency:** information about the system is made widely available to all stakeholders and the general public;
- **Timeliness:** grievances are attended to and resolved on time;
- **Fairness:** feedback or complaints are validated thoroughly and subjects of complaints are given due process and opportunities for appeal;
- **Confidentiality:** the identity of complainants remains confidential;
- **Provide multiple uptake points to build trust and confidence in the GRM.** Complainants will be provided with multiple channels to submit their complaints;

- Develop a simple system (possibly electronic-based) for receiving, sorting, verifying, and tracking complaints about more effective management of grievances; and
- Publicly disclose the complaints/grievance redress arrangements so that people are aware of where and how complaints will be managed.

9.3.1 Grievance Procedure

A Grievance Redress Committee (GRC) shall be established and composed of MoE, EDSA, WARD councillors, traditional chiefs, and WARD committees before the commencement of construction site works and the Engineering, Procurement and Construction (EPC) contractors shall be briefed of the GRM system. The GRC will be headed by a grievance redress officer at the EDSA and steps will be taken to ensure that all grievances are appropriately documented and updated in a database for tracking of resolution.

The GRC members may require some capacity in managing grievances. Therefore, a budget will be allocated for training and sitting allowances for the GRC members.

Overall, the grievances management steps will include the following:

- Lodge complaints through a phone call, text message, WhatsApp, in-person directly to community influencers, the grievance redress officer at the EDSA or the appeals committee all at the Project level.
- Acknowledgement and registration of complaints within 2 days
- The investigation, verification, and determination of resolution options. Complaints shall be acted upon within fourteen (14) working days;
- Provision of feedback to the stakeholder regarding resolution and progress towards resolution and complainant satisfaction within 2 days of receipt of resolution outcome
- Final resolution -tracking and documenting actions and outcomes in the database and with the stakeholder;
- Where a PAP is fully satisfied with the resolution process, the matter will be formally closed.

If the complainant is not satisfied with the mediation at the community and EDSA levels, a referral to an appeals committee is required at all the Project levels. While the Project will undertake reasonable efforts to resolve all grievances within the Project structures, complainants will still have the right to resort to the court of law to get a final settlement where the resolution offered by the Project is not accepted.

EDSA should maintain all records of grievances in a database. The scope of reporting should include:

- Quarterly reporting of grievance mechanism data
- The types of complaints received, response times, offers of the resolution, and acceptance and complaints resolved vs. appealed
- Whether the Project worked to improve processes to eliminate the issue causing a repeated concern
- Track any unresolved or illegitimate complaints where a resolution was offered but not accepted.
- Timeframe to analyze the effectiveness of the GRM and make changes as appropriate

9.3.2 Levels of Grievance Resolution

Tier 1: Ward councillors and other community influencers shall be the first level to resolve grievances. Councillors, chiefs, headmen, and other community stakeholders are known community structures for dispute resolution who reside in their local communities to be engaged by PAPs more easily. PAPs prefer this easy access and familiar means to settle disputes in their communities. However, to ensure effective grievance management at this level, the councillors should be trained on the resettlement/livelihood processes (*Figure 2*).

Tier 2: When grievances are not resolved at tier 1, PAPs can file a complaint to any person at tier 2. Also, PAPs can directly report a grievance to tier 2. A PAP shall file grievances using a complaint form (エラー! 参照元が見つかりません。) for sample form). All complaints received in writing (or written when presented verbally) and processed through the stages identified in the GRM, will be recorded in a register or log sheet by the Environmentalist at EDSA and updated in a database. The register presents the date of the complaint, the name of the complainant, the community she/he is from, a description of the complaint, and the actions taken to address the grievance (which shall also note the status of the grievance).

Acknowledgment of receipt of grievance reports should be within seven working days. Outcomes from the decision should be provided within fourteen (14) working days of receiving the complaints, which should be communicated to the PAP. Once a grievance or complaint has been resolved or being escalated, the officer responsible shall complete a Grievance/Complaint Resolution/Escalation Form (see エラー! 参照元が見つかりません。 for sample form) to close out the complaint or record the reason for escalation, and the officer and the complainant shall sign the form (if she/he so desires), with a witness.

However, where no amicable resolution is reached with the PAP or the PAP does not receive a response from the stakeholders in tier 2, the PAP can appeal to the GRC, which should look at the complaint within fourteen (14) working days.

Tier 3: The court of law will serve as the last resort for all types of grievances. According to grievance redress procedures, PAPs should be exempted from all administrative and legal fees. However, the decision to use the court as a redress mechanism should be left to the discretion of a PAP.

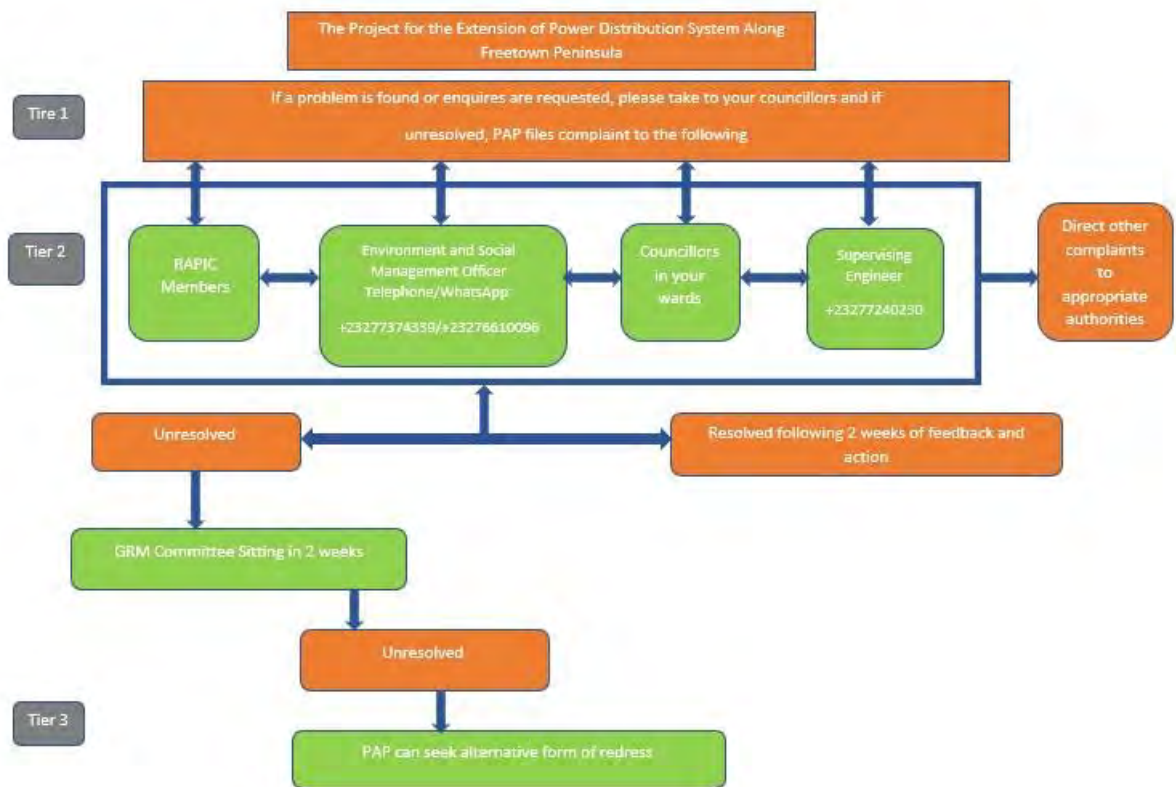


Figure 1: GRM Structure

10. RAP Implementation

10.1 RAP Implementation Arrangement

EDSA has a functional implementation arrangement for RAP/ARAP implementations. The implementation arrangement mentioned below has been used for the Bo-Kenema project, the Energy Sector Utility Reform Project (ESURP), and the ESURP Additional Finance (ESURP-AF) implemented in Sierra Leone.

This arrangement can be adopted for the extension of power distribution system along the Freetown Peninsula.

10.1.1 Roles and Responsibilities

The Ministry of Energy will provide general Project oversight. Planning, management, and implementation of the resettlement/livelihood are the responsibility of the Environmental and Social safeguards Specialists at EDSA. For successful implementation of the Project, a RAP Implementation Committee (RAP IC) will be established to support all activities of the implementation of the ARAP. The RAP-IC oversees the implementation of the resettlement/livelihood and shall work with the resettlement/livelihood implementation schedule. The implementation process will require that MoE and EDSA coordinate with several stakeholders. An Inter-Ministerial Sub-Committee (ISC) will be established to provide the necessary support to the Project's implementation.

(1) The Inter-Ministerial Sub-Committee (ISC)

The ISC shall support the RAP IC access to necessary legal documentation such as building permits, house plans, etc. on properties within the RoW.

This committee is comprised of officials from Statehouse, Ministries of Energy and Lands, Roads Authority, the Sierra Leone Police, EPA-SL, Ministry of Lands, Ministry of Works and Infrastructure, the Law Office Department, Ministry of Information and Communication, Office of National Security and a representative from the RAP-IC.

Structure of the Committee

The committee is structured as follows:

- A Chairperson - Director of SPU responsible for convening meetings; chairing and moderating meetings and also giving responsibilities to committee members

- A Coordination Committee - where other Ministries Departments and Agencies (MDAs) can be co-opted on a needs basis
- A Secretariat - the MoE will coordinate activities before, during and after committee meetings

Composition of the Committee

- Deputy Minister, Ministry of Energy
- Head, Road Infrastructure Monitoring and Protection Unit – SLRA
- WARD Council
- Civil Engineer, Civil Engineering Department - Ministry of Works, Housing and Infrastructure
- Director, Disaster Management Unit - Office of National Security
- Director General – EDSA
- Senior Regional Officer – Environmental Protection Agency
- Sierra Leone Police
- Deputy Director, Surveys and Lands - Ministry of Lands, Housing and Country Planning
- Senior Information Officer - Ministry of Information and Communications
- Principal State Counsel, Law Officers’ Department - Attorney General’s Office
- Senior Director - Strategic and Policy Unit, State House
- Adviser to the President on Energy and Infrastructure - Strategic and Policy Unit, State House
- Chairman of Energy Committee – House of Parliament

Major Responsibilities

The Inter-Ministerial Sub-Committee (ISC)

- supports monitoring activities and enforce regulations to protect the RoW, with particular emphasis on congested communities
- facilitates the demolition of all affected structures as per defined Project guidelines for demolition
- ensures timely implementation of the RAP and related issues to the RoW

Expected Outputs

Specifically, the expanded inter-ministerial will have the following outputs:

- Access to necessary legal documentation such as building permits, house plans, etc. on properties within the RoW facilitated;
- All structures violating RoW clearances will be demolished, including:
those identified as ineligible for compensation

- PAPs that had received compensation and yet in occupancy in the RoW;
- structures in the RoW that have been built after cut-off date;
- temporary structures during rehabilitation works of the Contractor
- safeguards monitoring enhanced
- community sensitization as well as door-to-door sensitization on electric hazards associated with living under the RoW supported

Frequency of Meetings

Quarterly meetings will be held and where necessary extraordinary meetings will be organized. For resettlement/livelihood implementation, monthly meetings will be held.

(2) The RAP IC

The committee will assist in the validation of the PAPs, and in identifying affected persons for compensation. The contractor shall submit a construction work plan to the committee, which the supervising engineer of EDSA must endorse. This committee will meet regularly to review the work plan and discuss other matters. An adequately constituted structure for administration and implementation of the resettlement/livelihood plan is imperative and agreement must be reached from the onset with the committee members. The RAP-IC will need capacity building to successfully implement the resettlement/livelihood plan. This should be budgeted for.

Composition of the RAP-IC

The composition of the committee shall include the main stakeholders in the Project.

- EDSA (Facilitator/secretariat)
- EDSA Legal Representative
- MoE
- EDSA Planning Network Planning Department Representative
- EDSA Health and Safety Department Representative
- WARD Council Chief Administrator, Community Councillors, council Engineer,
- Traditional Leaders/Chiefs of the respective Communities,
- Witness NGO
- A representative from the PAPs
- A representative from Disabled Organizations
- A representative from the Ministry of Lands, Housing and Country Planning
- A Representative from SLRA
- A Representative of Inter-religious Council (Pastor & Imam)
- A Representative of Traders Union

Structure

- i) Chairperson: responsible for convening meetings; chairing and moderating meetings and also give responsibilities to committee members
- ii) A Coordination Committee - where other stakeholders can be co-opted on a needs basis
- iii) Secretariat: The Facilitator/ Secretariat, the EDSA, will be responsible for the following:
 - Coordinate, organise, and facilitate committee and PAP meetings, including preparation of an agreed standing agenda, presentations, and sending minutes to stakeholders;
 - Act as a key contact person for the ISC;
 - Co-ordination and liaison, including tracking and reviewing Project progress through regular meetings with respective committee members and committees;
 - Ongoing reporting and communication to the RAP-IC, and ISC, through a communication strategy, on the progress of committee related matters;
- iv) Other responsibilities include but are not limited to:
 - Providing upfront planning, scheduling, and resourcing for the Project;
 - Reviewing the resettlement/livelihood preparation process, including the scope, budget, and schedule;

Frequency of Meetings

- Monthly meetings for the duration of the resettlement/livelihood planning and development phase will be held.
- All meetings will be accompanied by an agenda, minutes of the meeting, and action plan;
- Meeting invites will go out 2 weeks before the meeting to secure a suitable timeslot and a telephonic reminder will be done 2 days before the meeting;
- Meetings will take place at the most convenient and practical location for all members

10.2 Procedures for Delivery of Entitlements

The procedure for delivering of entitlements will be detailed in the resettlement/livelihood plan. EDSA shall follow approved procedures, ensuring that full payment of compensation is made before possession of acquired sites.

A database of PAPs prepared by the resettlement/livelihood plan consultant forms the basis for compensation. The database should include the name, telephone number, photo, description of the affected property, total compensation, etc. of PAPs. EDSA shall then hold consultations with PAPs to negotiate with PAPs to agree on the compensation package, highlight the time allowed to salvage properties, establish payment methods.

10.2.1 Payment of Compensation

The following shall be followed:

- i. The compensation rates and total budget should be verified and approved by EDSA
- i. Once EDSA approves the compensation rates and total budget, EDSA shall proceed to sign individual compensation agreements with PAPs
- ii. Payment of cash will be made via direct bank transfer to the PAPs bank account. EDSA shall open bank accounts for PAPs if they do not have one to pay in cash instead of giving them cheques.
- iii. Payments to PAPs should be made in the presence of the RAP-IC.
- iv. A local NGO should be hired to monitor the payment process.
- v. Every stage of the process will be photographed, and all PAPs will be thumb printed
- vi. Compensation shall be paid before displacement

10.3 Preparation of ARAP and Setting Up of Resettlement Management Teams

エラー! 参照元が見つかりません。 shows typical steps to prepare ARAPs and set up resettlement teams.

Table 8: ARAP Preparation Steps and Setting up Resettlement Management Committees

Step	Detail	Responsibility	KPIs
Conduct census and socio-economic survey	Identification of PAPs including those who were not available during the course of the survey and resistant PAPs as well as the vulnerable.	EDSA/Consultant	Survey data (including pictures and full details of PAPs) stored in a database

	Survey of affected assets		
Establish cut-off date	Determine the cut-off date and develop the cut-off date communication strategy and budget. Communicate the cut-off date as determined	EDSA/Consultant	Cut-off date implementation plan signed off
Preparation, review and publishing of the ARAP	Local publication at the MoE/EDSA website and local tabloids and also at JICA website	JICA/MOE / EDSA	ARAP published
Establish the RAP IC	Send out invitation letters and launch committee; ToRs for RAP IC	EDSA	Meeting minutes of RAP IC meetings
Validate ARAP	Approve eligibility criteria including the LRP for each PAP	EDSA/ RAP IC	PAP entitlements signed off
Develop Monitoring Plan	Recruit the services of an Independent Monitor; develop internal monitoring plan	JICA/EDSA	Monitoring plan signed off and completed
Recruit firm or provide for Livelihood Restoration Program	Draft ToRs; Evaluate CVs; Negotiations; Contract signing; develop and implement plan	JICA/EDSA	List of PAPs eligible for LRP
Notification of eligibility	Prepare notification letters of eligibility. Letter should request proof of ownership/tenancy where applicable	JICA/EDSA	Proof of delivery of notification letters to every PAP on eligibility matrix
PAP initial consultations	Informing community leadership; Preparing invitation letters; Developing meeting agenda (Project background, ARAP process, GRM, Cut-off date, title claims, ID cards); print posters,	JICA/EDSA	Initial meetings with PAPs undertaken

	Selection of meeting locations, media and other arrangements and secure budget funds; Documentation (minutes, pics, recording)		
PAP negotiations	Invitation letters to negotiations meetings; Prepare negotiations sign-off sheets; Draft negotiations points (compensation amount, in-kind/cash compensation, time required to salvage, preferred option for demolition etc.); Negotiations meeting; Identify alternatives and include in compensation agreements	JICA/EDSA	Signed PAP negotiations form
PAP compensation	Draft compensation agreement forms; Confirm Powers of Attorney (PoAs) and claims; Outsource service of fund manager; Selection of meeting locations, media and other arrangements and secure budget funds; Sign final agreements	JICA/EDSA	Signed compensation agreements; signed cheques
Demolition of affected structures	Source service provider; Prepare MoU or Contract as the case may be; Budget; Establish mutual expectations around workers health and safety procedures and community health and safety; demolish as per	JICA/EDSA	Demolition report

	agreed timeline with PAPs		
Hand over site to contractor		JICA/EDSA	Handing over notes/ photos
Supervision of construction works		JICA/EDSA	Onsite checklist or forms
Grievance management	develop grievance registers; set up WhatsApp group;	JICA/EDSA	Number of grievances received

10.4 Public Disclosure Process of ARAP

An ARAP should be made public where stakeholders and PAPs can access it. EDSA would publicly disclose this ARAP, in English and a summarized version in Krio, where need be in the newspapers, on radio and TV. Copies of the ARAP would be made available and distributed at the offices of EDSA and the Ministry of Energy and ensure that the public will be notified both through administrative structures and informal structures about the availability of the ARAP documents and be requested to make their suggestions and comments. A public workshop would be organized to disclose the contents of the ARAP and seek feedback from the public on the contents.

10.5 ARAP Implementation Budget

According to the estimates in the ARAP-related budgets covering ARAP preparation and implementation that EDSA formed, costs for land acquisition and resettlement and budget required for implementation, and their breakdowns are shown in Table 11, Table 12 and Table 13. EDSA is responsible for securing the fund for costs displayed in the ARAP.

Table 11 Cost and Budget for Compensation and ARAP Implementation

Item	Cost (USD)
Compensation costs	79,700
ARAP Implementation budget	70,300
Total	150,000

Table 12 Cost of Compensation

Items for Compensation	Cost (USD)
Land	14,230
Trees	3,320
Buildings	62,150
Total	79,700

Table 13 Breakdowns for Implementation Budget

	Activities	Responsible Organizations	Unit	Quantity	Cost (USD)
1	Implementation Preparation				
(1)	Survey recommissioned to consultant	EDSA/Consultant	Set	1	50,000
(2)	Consultations with PAPs through community leaders	EDSA/Community Leaders	Set	1	7,000
2	Implementation				
(1)	Grievance Redress	EDSA/Community Leaders	Set	1	3,300
(2)	Monitoring by NGO	EDSA/NGO	Set	1	10,000
Total					70,300

10.6 ARAP Implementation Schedule

No.	Activity	Description	2022		
			Sep.	Oct.	Nov.
1	Presentation of ARAP to EDSA	Presentation of findings of ARAP, document and response to feedback, sharing expectations during ARAP implementation			
2	Presentation of ARAP to EDSA Board	Presentation of findings of ARAP, document and response to feedback, sharing expectations during ARAP implementation			
3	Presentation of ARAP to RAP IC	Feedback and support, preparation of survey plans (for private land acquisition), verification of valuations, verification of title deeds			
4	ARAP Disclosure	Public disclosure of ARAP			
5	Preparation of PAP eligibility	Draft letters including name of PAP's, address, affected asset right, request for submission of relevant documentation			
6	Initial PAP consultations	Presentation of eligibility letters, discussions around project design, entitlements, cut-off date, GRM, environment, health and safety measures, ARAP timelines, welcome feedback from PAPs. Two meetings will be organized			
7	Conducting any required follow-ups from feedback from meetings	Grievances could be registered during initial PAP consultations that will need to be further investigated and determined			
8	Preparation of PAP sign-off (negotiations) forms	This will include listing of compensation entitlements, photo of PAPs and sign-off from PAP with the understanding that this is not the compensation agreement form			
9	PAP negotiations and sign-off	This will be done at the community. PAPs will be informed of compensation strategy including payment method, paying bank, required identification, etc.			
10	Resolving any arising issues	Access any alternative compensation options that may arise			
11	Verification of title deeds	For those whose private land is affected, verify ownership and determine whether cost for land will be included in compensation cost or not			
12	Agree on final compensation matrix and sign-off	ARAP budget will be reviewed after determination of whom to be compensated and not to be compensated			
13	Preparation of compensation agreement including review periods	Draft agreement with support of RAP IC, and EDSA lawyers for review			
14	Identifying and confirming any Powers of Attorney (POA)	Confirmation from PAP on who POA is, PAP and POA to sign an agreement, submission and inspection of ID cards			
15	Compensation and sign-off	This will be done at the the communities with participation of EDSA, RAP IC, Community Leaders and PAPs. Ministry of Energy will sign the agreements with the PAPs and will be witnessed by the Community Leaders (Ward Concilor)			
16	Monitoring salvaging of assets or harvesting as the case may be	Conduct regular site visits to monitor process and respond to any issues			
17	Demolition	EDSA will prepare written guidelines for the Contractor on this process			

10.7 Resettlement Risk Assessment and Mitigation Strategy

The risks from resettlement and social impacts on projects can threaten the project's license to operate and could result in delays, budget increase and serious reputational damage. It is important to understand that the success of the project depends on how well risks are identified and how efficiently they are managed. Table 14 below identifies risks to the success of the project and suggest ways in which the risks can be mitigated. During implementation, risks can be further identified, and the table can be updated by EDSA.

Table 14 Risk matrix

No.	Description of Risk	Rating (1-10)*	Risk Mitigation Strategy
1	Distribution line design not available by the start of ARAP-related work.	8	The exact locations of poles, particularly the first new 12 poles from Goderich substations to Sussex, shall be marked to determine the PAPs during detailed design.
2	Money for compensation not available in time to implement ARAP as soon as ARAP has been developed	5	EDSA to facilitate timely allocation funds for compensation.
3	ARAP not endorsed by EDSA	5	EDSA endorses the ARAP.
4	Contractors are unaware fo ARAP and ESMP and may implement their work without compliance to environment and social safeguards	4	<ul style="list-style-type: none"> inform Contractors and have them endorse Environment and Safeguards objectives; monitor their works.
5	Contractors change design after ARAP is finalized and disclosed	4	Verify ARAP as far as possible with Contractors before compensation is paid

* 1: Lowest, 10: Highest

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