ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) REPORT

WORKING DRAFT

FOR THE

PROPOSED CONSTRUCTION AND OPERATION OF A CASHEW NUT PROCESSING PLANT



AT

BOKE, REPUBLIC OF GUINEA

BY

Diaoune Agro Industrie .sarl

Prepared by

RF Richflood

2022

TABLE OF CONTENTS

List of Figures - - - - - - - - - - v

List of Tables - - - - - - - - - - vi

List of Plates - - - - - - - - - - viii

List of Abbreviations and Acronyms - - - - - - - - ix

Units of Measurements - - - - - - - - - xii

1 INTRODUCTION

1.1 Project Background - - - - - - - - - 1-1

1.2 Project Proponent - - - - - - - - - 1-1

1.3 ESIA Environmental and Social Consultant - - - - - - 1-2

1.3.1 Richflood International Limited - - - - - - - 1-2

1.4 Project Justification - - - - - - - - - 1-2

1.5 ESIA Objectives and Methodology - - - - - - - 1-3

1.5.1 Overall methodology framework - - - - - - - 1-3

1.6 Scope of ESIA, Need and Desirability - - - - - - - 1-9

1.7 Assumptions and Limitations - - - - - - - - 1-10

1.7.1 Assumptions - - - - - - - - - - 1-10

1.7.2 Limitations - - - - - - - - - - 1-11

1.8 ESIA Study Team - - - - - - - - - 1-12

1.8.1 Site Surveys and Specialist Studies - - - - - - - 1-12

1.9 Structure of the Report - - - - - - - - - 1-12

2 INSTITUTIONAL AND REGULATORY FRAMEWORK

2.1 Guinean Institutional Context - - - - - - - - 2-1

2.1.1 Ministries relevant to the project - - - - - - - 2-2

2.2 Guinean Regulatory Framework relevant to the Project - - - 2-2

2.2.1 The Environment Code- - - - - - - - - 2-2

2.2.2 Regulations on Environmental and Social Impact Assessment - - - 2-3

2.2.3 The classified installations for Environmental Protection - - - 2-6

2.2.4 Regulatory Framework on Land - - - - - - - 2-6

2.2.4.1 Land and Estate Code (« Code Domanial et Foncier ») - - - - 2-6

2.2.5 Forestry Code - - - - - - - - - 2-7

2.2.6 Urban Planning Code - - - - - - - - - 2-7

2.2.7 Local Government Code - - - - - - - 2-8
2.2.8 Specific Environmental Legislation - - - - - - 2-8
2.2.8.1 Biodiversity Code - - - - - - - - 2-8
2.2.8.2 Wildlife Code - - - - - - - - - 2-8
2.2.8.3 Air emissions - - - - - - - - - 2-9
2.2.8.4 Noise emissions - - - - - - - - 2-10
2.2.8.5 Water Code - - - - - - - - - 2-11
2.2.8.6 Waste Management - - - - - - - - 2-12
2.2.9 Specific Social Legislations - - - - - - - 2-13
2.2.9.1 The Labor Code - - - - - - - - 2-13
2.2.9.2 Workers Health and Safety - - - - - - - 2-14
2.2.9.3 Social Protection - - - - - - - - 2-14
2.2.9.4 Public Health - - - - - - - - - 2-14
2.2.9.5 The Investment Code - - - - - - - - 2-15
2.2.9.6 Guinea Child Code - - - - - - - - 2-15
2.2.9.7 Law on Child Labour - - - - - - - - 2-15
2.3 International Conventions and Protocols - - - - - 2-15
2.4 International Best Practices, Standards and Guidelines - - - - 2-22
2.4.1 United States International Development Finance Corporation Standards and Guidelines - - - - - - - - - 2-22
2.4.2 International Finance Corporation Performance Standards - - - 2-23
2.4.3 International Finance Corporation/World Bank Group (IFC/WB) EHS Guidelines 2-31
2.4.3.1 Air emissions - - - - - - - - - 2-31
2.4.3.2 Noise emissions - - - - - - - - - 2-32
2.4.3.3 Water - - - - - - - - - - 2-33
2.4.4 IFC Good Practice Handbook and Notes - - - - - 2-34
2.4.4.1 IFC Good Practice Note Addressing Grievances from Project-Affected Communities 2-35
2.4.4.2 IFC Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets - - - - - - - - 2-35
2.4.4.3 IFC Workers' Accommodation: Process and Standards - - - 2-35
2.4.4.4 IFC Good Practice Handbook: Use of Security Forces: Assessing and Managing Risks and Impacts - - - - - - - - - 2-35
2.4.4.5 IFC Good Practice Note: Managing Risks Associated with Modern Slavery - 2-35

2.4.4.6 IFC Good Practice Note: Addressing Gender-Based Violence and Harassment (GBVH) Emerging Good Practice for the Private Sector - - - 2-36
2.4.4.7 Good Practice Note: Managing Contractors' Environmental and Social Performance 2-36
2.4.5 DAI Health, Safety and Environmental Policy - - - - - 2-36

3 PROJECT DESCRIPTION

3.1 Introduction - - - - - - - - - 3-1
3.2 Project Location - - - - - - - - - 3-2
3.3 Pre-Construction Phase- - - - - - - - - 3-5
3.4 Construction Phase - - - - - - - - - 3-5
3.4.1 Project Construction Contractor - - - - - - - 3-8
3.5 Operation Phase - - - - - - - - - 3-8
3.5.1 Raw material sourcing and Equipment Requirements - - - - 3-8
3.5.2 Processing of raw cashew nuts - - - - - - - - 3-9
3.5.3 Distribution and Export - - - - - - - - 3-20
3.6 Expected Waste Streams and Emissions - - - - 3-20
3.6.1 Solid waste generation and management - - - - - 3-20
3.6.2 Waste Water - - - - - - - - - 3-21
3.6.3 Air Emissions - - - - - - - - - 3-22
3.6.4 Noise Pollution- - - - - - - - - 3-22
3.7 Auxiliary Facilities - - - - - - - - - 3-23
3.7.1 Water Use Requirements - - - - - - - - 3-23
3.7.2 Power Requirement - - - - - - - - - 3-23
3.8 Workforce Requirements - - - - - - - - 3-23
3.9 Project Schedule/Implementation - - - - - - 3-24
3.10 Decommissioning and Restoration Phase - - - - - 3-24
3.11 Project Alternatives - - - - - - - - - 3-25
3.11.1 No-Go Alternatives - - - - - - - - - 3-25
3.11.2 Project Site Alternatives - - - - - - - - 3-26
3.11.3 Technology Alternatives - - - - - - - - 3-26

4 ENVIRONMENTAL AND SOCIAL BASELINE

4.1 Introduction - - - - - - - - - 4-1
4.2 The Study Area - - - - - - - - - 4-2
4.3 Physical Environment - - - - - - - - - 4-3

4.3.1 Climate and meteorology - - - - - - - 4-3
4.3.2 Geology - - - - - - - - - 4-5
4.3.3 Topography, Relief and Drainage - - - - - - 4-7
4.3.4 Soil - - - - - - - - - - 4-8
4.3.5 Landcover - - - - - - - - - 4-10
4.3.6 Water Quality - - - - - - - - - 4-10
4.3.7 Soil Quality - - - - - - - - - 4-24
4.3.8 Air Quality - - - - - - - - - 4-28
4.3.9 Noise - - - - - - - - - 4-35
4.3.10 Land Use - - - - - - - - - 4-36
4.3.11 Land Use/Land Cover - - - - - - - - 4-38
4.4 Ecological Resources - - - - - - - - 4-40
4.4.1 Habitats - - - - - - - - - 4-42
4.4.2 Habitat Sensitivity - - - - - - - - 4-49
4.4.3 Flora - - - - - - - - - 4-50
4.4.4 Mammals - - - - - - - - - 4-54
4.4.5 Avifauna - - - - - - - - - 4-54
4.4.6 Herpetofaun - - - - - - - - - 4-55
4.4.7 Ecosystem Services - - - - - - - - 4-56
4.4.8 Current impacts to ecological resources - - - - - 4-56
4.5 Socio-economic Conditions - - - - - - - 4-57
4.5.1 Administrative Divisions and Institutions - - - - - 4-60
4.5.2 Project Area of Influence - - - - - - - 4-64
4.5.3 Access to basic social services and related infrastructure - - - 4-66
4.5.4 Education - - - - - - - - - 4-67
4.5.5 Livelihood practises - - - - - - - - 4-69

5 ASSESSMENT OF ENVIRONMENTAL AND SOCIAL IMPACTS

5.1 Introduction - - -- -- - - - - - 5-1
5.2 Impact Assessment Methodology - - - - - - 5-1
5.2.1 Predicting the magnitude of impacts - - - - - - 5-1
5.2.2 Impact Significance Rating - - - - - - - 5-2
5.2.3 Sensitivity/vulnerability/importance of resources and receptors - - 5-3
5.2.4 Assessment of impact significance - - - - - - 5-3

5.2.5 Mitigation measures - - - - - - - - 5-5
5.2.6 Residual impacts significance - - - - - - - 5-6
5.3 Screening / Identification of Impacts - - - - - - 5-7
5.4 Preliminary Assessment of Impacts - - - - - - 5-12

6 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

6.1 Introduction - - - - - - - - - 6-1
6.2 Environmental Management Measures - - - - - - - 6-1
6.2.1 Mitigation Measures during the Construction Phase - - - - 6-1
6.2.2 Mitigation Measures during the Operation Phase - - - - 6-7
6.2.3 Mitigation measures during Decommissioning and Closure phase - - 6-15
6.3 Cumulative Impacts - - - - - - - - 6-18
6.4 DAI Organizational Structure - - - - - - - 6-19
6.5 Environmental Management Plans/Framework - - - - 6-20
6.5.1 Emergency Response Plan - - - - - - - 6-21
6.5.2 Waste Management Framework - - - - - - 6-22
6.5.3 Stakeholders Engagement Plan - - - - - - - 6-30
6.6 Environmental Monitoring Plan - - - - - - 6-32
6.7 Reporting and Reviewing Procedures - - - - - - 6-48
6.8 Training Needs - - - - - - - - - 6-49
6.9 Auditing and Management Reviews - - - - - - 6-50

7 STAKEHOLDER ENGAGEMENT

7.1 Background to the Project Stakeholder Engagement - - - - 7-1
7.2 Objectives of the Stakeholder Engagement Plan - - - - 7-2
7.3 Stakeholders Engagement Activities Conducted as Part of ESIA - - 7-3
7.4 Approach to the Project SEP - - - - - - - 7-5
7.5 Proposed methods for future Engagement - - - - - 7-5
7.6 Proposed Stakeholder Engagement Programme - - - - 7-5
7.7 Grievance Mechanism - - - - - - - - 7-6
7.7.1 Monitoring the Grievance Process - - - - - - 7-8
7.7.2 Roles and Responsibilities - - - - - - - 7-8

LIST OF FIGURES

Figure 1.1:	Impact Assessment (IA) Approach Flow Chart	1-3
Figure 2.1	Overview of ESIA development and approval process in Guinea	2-5
Figure 2.2:	Overview of IFC Performance Standard	2-24
Figure 3.1:	Location of the Proposed Project	3-2
Figure 3.2a:	3D Virtual Plan of the proposed process factory	3-3
Figure 3.2b:	3D Virtual Plan of the proposed process factory	3-4
Figure 3.3:	Layout Plan of the cashew nut processing plant showing the different sections of the facility	3-6
Figure 3.4:	Layout Plan of the cashew nut processing plant showing the different sections of the facility	3-7
Figure 3.5:	Cashew kernel grading	3-17
Figure 3.6:	The Distribution chain for DAI SARL products	3-20
Figure 4.1:	Location of the project site including surrounding villages surrounding within Boke Prefecture	4-3
Figure 4.2:	Schematic streamlines of near-surface flow in the Global Tropics	4-4
Figure 4.3:	Geologic Map of Guinea	4-6
Figure 4.4:	Geologic Map of the Proposed Project Area	4-7
Figure 4.5:	Topographic map of the project area	4-8
Figure 4.6:	General Soil Map for Guinea Republic	4-9
Figure 4.7:	Surface water Sampling Map	4-13
Figure 4.8:	Groundwater Sampling Map	4-19
Figure 4.9:	Air Quality and Noise Sampling Map	4-33
Figure 4.10:	Land Use Land Cover Map of the Project Area	4-39
Figure 4.11:	Chart showing the Land Use Land Cover Classes	4-40
Figure 4.12:	Land cover and Habitat delineated for the project area	4-43
Figure 4.13:	Population Composition of Boke region	4-58
Figure 4.14:	Age Distribution of Boke region2	4-58
Figure 4.15:	Percentage of Rural to Urban areas in Boke region	4-59
Figure 4.16:	Leadership Hierarchy in the Communities around the Project Area	4-63
Figure 4.17:	Area of Influence Map of the Proposed Project Area	4-65
Figure 4.18a:	Source of Energy for Lightning	4-66
Figure 4.18b:	Source of Energy for Cooking	4-66

Figure 4.18: Source of Drinking Water at the Project Area - - - - - 4-67
Figure 4.19: Educational Status of the Project area - - - - - - 4-68
Figure 4.20: Literacy Status of the Project area - - - - - - 4-68
Figure 4.21: Economic activities in the study area - - - - - - 4-69
Figure 4.22: Cashew Farm Owners Status at the area - - - - - 4-70
Figure 4.23: Cashew Plantation Status per Household at the area - - - - 4-70
Figure 6.1: DAI organisational structure - - - - - - - - 6-20
Figure 6.2: Waste Hierarchy Diagram 1 - - - - - - - - 6-25
Figure 6.3: Waste Hierarchy Diagram 2 - - - - - - - - 6-26

LIST OF TABLES

Table 1.1:	Impact Characteristic Terminology	1-5
Table 1.2	Impacts significance matrix	1-7
Table 2.1:	Air quality standards: Guinean directives	2-9
Table 2.2:	Emission limits for stationary combustion units: Guinean directives	2-10
Table 2.3	Ambient noise levels: proposed Guinean standards	2-10
Table 2.4:	Effluent quality parameters before discharge in the environment	2-12
Table 2.5:	International Conventions and Treaties	2-16
Table 2.6	Summary of International Finance Corporation Performance Standards and how they are addressed in this ESIA	2-25
Table 2.7	Air quality standards: Guinean and IFC General EHS directives	2-32
Table 2.8	Ambient noise levels: proposed Guinean standards and IFC guidelines	2-33
Table 2.9	Effluent quality parameters before discharge in the environment	2-34
Table 3.1:	List of plant and machinery required	2-9
Table 3.2:	Proposed project solid waste and management options	2-20
Table 3.3:	Summary of wastewater and management options	2-21
Table 3.4:	Summary of Air pollution sources and control equipment	3-22
Table 4.1	Method for Water Analysis	4-10
Table 4.2:	Surface water sampling location	4-12
Table 4.3:	Details of Surface water Locations	4-14
Table 4.4:	Surface Water Quality Analysis	4-14
Table 4.5:	Groundwater Sampling location	4-18
Table 4.6	Details of Ground Water Sampling Locations	4-20
Table 4.7:	Groundwater Quality Analysis	4-21
Table 4.8	Location of Soil Samples	4-25
Table 4.9:	Soil Quality	4-26
Table 4.10:	Guinean and IFC/WHO air quality standards	4-29
Table 4.11:	Air Quality and Noise sampling location	4-32
Table 4.12:	Results of the Air Quality Monitoring	4-34
Table 4.13:	Ambient noise levels: proposed Guinean standards and IFC guidelines	4-35
Table 4.14:	Results of the Noise Monitoring	4-35
Table 4.15:	Percentage of Land Use and Land Cover Classes of the Project area	4-40
Table 4.16:	Flora species recorded in the proposed project area	4-52

Table 4.17: Avifaunal species recorded in the project area during the field assessment - 4-54
Table 4.18: Herpetofauna species recorded in the project area during the field assessment - 4-56
Table 5.1 Impact Characteristic Terminology - - - - - - 5-2
Table 5.2 Significance Matrix - - - - - - - - 5-4
Table 5.3 Hierarchy of options for mitigation - - - - - - 5-6
Table 5.4 Ranking of residual impacts - - - - - - - 5-6
Table 5.5: Environmental Impacts Screening Matrix for the Cashew-nut Processing Plant Project 5-8
Table 5.6a: Preliminary Assessment – Environmental Impacts during the Construction Phase 5-13
Table 5.6b: Preliminary Assessment – Social Impacts during the Construction Phase - 5-20
Table 5.7a: Preliminary Assessment – Environmental Impacts during the Operational Phase 5-26
Table 5.7b: Preliminary Assessment – Social Impacts during the Operational Phase - 5-43
Table 5.8a: Preliminary Assessment – Environmental Impacts during the Decommissioning and Closure Phases - - - - - - - - - 5-48
Table 5.8b: Preliminary Assessment – Social Impacts during the Decommissioning/Closure Phase - - - - - - - - - - 5-52
Table 6.1: Mitigation measures for construction phase impacts as listed by Richflood for the Cashew-nut Processing Plant - - - - - - - 6-2
Table 6.2 Mitigation Measures during the Operation Phase - - - - 6-8
Table 6.3: Environmental and social monitoring plan for the construction phase of the project 6-33
Table 6.4: Environmental and social monitoring plan for the operation phase of the project 6-40
Table 7.1: Summary of stakeholders' feedback, concerns and expectations - - 7-4
Table 7.2: Roles and responsibilities - - - - - - - 7-8

LIST OF PLATES

Plate 3.1:	Raw cashew nut cleaning and calibration machine	3-11
Plate 3.2:	Cashew nuts steaming machine	3-12
Plate 3.3:	Cashew nut shelling machine	3-13
Plate 3.4:	Cashew nut drying oven (left) and fumigation machine (right)	3-14
Plate 3.5:	Cashew nut peeling Machine	3-15
Plate 3.6:	Cashew kernel grading machine	3-16
Plate 3.7:	Manual Grading Process	3-16
Plate 3.8:	Packaging Machine	3-18
Plate 3.9:	Packaged and sealed cashew kernel	3-19
Plate 3.10:	Storage Warehouse	3-19
Plate 4.1:	Palm plantation within the project AoI	4-37
Plate 4.2:	Cashew Plantation within the Project AoI	4-37
Plate 4.3a:	Agricultural plantation (Palm plantation observed) in the area	4-45
Plate 4.3b:	Agricultural plantation (Cashew farm) observed in the area	4-46
Plate 4.4:	The freshwater stream observed at the edge of the project footprint	4-47
Plate 4.5:	Transformed habitat along Railway as observed within the project area	4-48
Plate 4.6:	Mosaic Natural and Modified Habitats	4-49
Plate 4.7:	Ecological Impacts observed: Wood burning to produce Charcoal	4-57

LIST OF ABBREVIATIONS AND ACRONYMS

AFI	Association of Food Industries
AIDS	Acquired Immune Deficiency Syndrome
Al	Aluminium
ALARP	As Low As Reasonably Practicable
AOI	Area of Influence
APHA	American Public Health Association
AQS	Air Quality Standards
ASTER	Advanced Spaceborne Thermal Emission and Reflection Radiometer
BAT	Best Available Technology
BGEEE	Bureau Guinéen des Etudes et Evaluation Environnemental
BOD	Biological Oxygen Demand
Br	Bromine
Ca^{2+}	Calcium
CEPC	Cashew Export and Promotion Council
CEPCI	Cashew Export Promotion Council of India
Cl-	Chloride
CNS	Cashew Nut Shell
CNSL	Cashew Nut Shell Liquid
CO	Carbon Monoxide
COD	Chemical Oxygen Demand
Co	Cobalt
CRO	Complaint Resolution Official
cT	Tropical-Continental
DFC	Development Finance Corporation
DO	Dissolved Oxygen
EBRD	European Bank for Reconstruction and Development
EC	Electrical Conductivity
EHS	Environment, Health and Safety
EPA	Environmental Protection Agency
ESIA	Environmental & Social Impact Assessment
ESMP	Environmental & Social Management Plan
ESMS	Environmental and Social Management System
E&S	Environmental and Social

Fe^{2+}/Fe^{3+}	Iron
GBVH	Gender-Based Violence and Harassment
GHG	Greenhouse Gases
GIIP	Good International Industry Practice
GIS	Geographical Information System
GPN	Good Practice Note
GPS	Global Positioning Sysytem
GW	Groundwater
H&S	Health and Safety
HSE	Health Safety and Environment
HIV	Human Immunodeficiency Virus
IA	Impact Assessment
IFC	International Finance Corporation
ILO	International Labour Organisation
IOP	Internal Operation Plan
ITCZ	Inter-Tropical Convergence Zone
K^+	Potassium
LWP	Large White Pieces
Mg	Magnesium
Mn	Manganese
MSDS	Material Safety Data Sheets
mT	Tropical-Maritime
MV	Means of Verification
Ni	Nickel
NOx	Nitrogen Oxides
NO_2-	Nitrite
NO_3-	Nitrate
OHS	Occupational Health and Safety
OSHA	Occupational Safety and Health Administration
PACs	Project-Affected Communities
PAP	Project Affected Persons
Pb^{2+}	Lead
PO_4^2	Phosphate

PPE	Personal Protective Equipment
QMS	Quality Management System
PS	Performance Standard
RAP	Resettlement Action Plan
RCIA	Rapid Cumulative Impact Assessment
RCN	Raw Cashew Nut
SCC	Species of Conservation Concern
SEP	Stakeholder Engagement Plan
SOGICO	Societe de Gestion Immobilière et de Construction
SO_2	Sulphur Dioxide
SS	Soil Sample
SSP	Scorched Small Pieces
SP	Scorched Pieces
SRTM	Shuttle Radar Topography Mission
STD	Sexually Transmitted Disease
TDS	Total Dissolved Solids
TSS	Total Suspended Solids
UN	United Nations
UNECE	United Nations Economic Commission for Europe
WB	White Butts
WBG	World Bank Group
WHO	World Health Organization
WMP	Waste Management Plan
WS	White Splits
WSP	White Small Pieces
WW	White Whole
WWTP	Wastewater Treatment Plant
Zn	Zinc

UNITS OF MEASUREMENTS

%	Percentage
<	Less Than
≤	Less Than/Equal to
>	Greater Than
≥	Greater Than/Equal to
°C	Degree Celsius
G	Grammes
g/l	Grammes per litre
kg	Kilogramme
Km	Kilometer
m	Metre
mg/l	Milligramme per litre
mg/Nm^3	
$\mu g/m^3$	Microgramme per metre cubic
℃	Degrees Celcius
S	Second

1 INTRODUCTION

1.1 Project Background

In a bid to harness the promising prospect of the agro-business sector in Guinea, Diaoune Agro-Industrie Sarl ("DAI or the Company") ventured into the Cashew nut processing business, through the constructing and currently operating a 10,000 metric tons per annum Cashew nut Processing Plant in Kankan, Republic of Guinea.

Furthermore, as part of its expansion drive into the business, Diaoune Agro-Industrie Sarl has proposed to construct and operate a Cashew nuts processing factory of similar capacity (10,000 metric tons per annum) in Boké, which is considered the largest cashew production basin in Guinea. The project will involve sourcing raw cashew nuts from licensed brokers and smallholder farmers in the Boke region and processing them into unflavoured cashew kernels majorly for export and a smaller percentage of local consumption.

Hence, Richflood International Limited was appointed by Diaoune Agro-Industrie Sarl to conduct an Environmental and Social Impact Assessment (ESIA) for the new Cashew nuts Processing Plant in Boke Region, Republic of Guinea. In executing this assignment, the studies will assess the impacts associated with the construction and operation of the new Cashew nuts Processing Plant in Boke region. The Environmental and Social Impact Assessment (ESIA) study has been conducted for the project in line with Presidential Decree No.199/PRG/SGG/89 of 18th November, 1989, made under Articles 82 and 83 of the Environmental Code which sets out the projects requiring an Environmental Impact Assessment (EIA) study.

1.2 Project Proponent

Diaoune Agro-Industrie is a subsidiary of Diaoune et Frères Sarl, established in Côte d'Ivoire in 2004. Diaoune et Frères Sarl has been a major player in the Cashew nut business, initially engaging in the cultivation and export of raw cashew nuts to the processing plant in Asian countries, particularly Vietnam and India.

With the vast experience in the cashew nut agro-business industry spanning more than fourteen (14) years, the management of Diaoune Agro-Industrie is deploying this rich knowledge and experience to bring more added value to the cashew industry in the Republic of Guinea and has already constructed and operated a 10,000 metric tons per annum cashew processing plant in the city of Kankan in upper Guinea. Diaoune Agro-Industrie Sarl is a registered agro-processing company in Guinea and has its headquarters in Conakry. The company engages in various

activities in the cashew nut value chain, which includes sourcing and processing raw cashew as well as export of cashew kernel. Currently, Diaoune Agro-Industrie operates the largest cashew nut processing plant in Guinea, which was established in 2019.

Furthermore, as part of the company's vision to increase value addition through the cashew agro-industry as one of Guinea's emerging sectors and boost export, Diaoune Agro-Industrie is planning to establish another cashew nut processing Plant in Boké, which largest cashew production basin in Guinea. The cashew nut processing Plant will operate at 10,000 metric tons capacity per annum which is similar to the existing Plant in Kankan.

1.3 ESIA Environmental and Social Consultant

1.3.1 Richflood International Limited

Richflood is an African Indigenous Company established in 2009, with its headquarters in Abuja, Nigeria. Richflood also has partnerships in the United Kingdom and the United States of America. Richflood is a leading continental provider of ESDD, ESIA and EHS services for investments in Africa serving public and private sectors in Africa.

1.4 Project Justification

Cashew has become a strategic export product for Guinea, which produces 100,000 tonnes of it annually. This production mainly occupies the agricultural populations of the North, Central-North, East and North-West of the country. The cultivation of cashew is an important source of income in Guinea as no less than 50,000 people derive their livelihood from this sector. The cashew tree is mainly cultivated for its nutrient-rich nuts used in diverse sectors, such as the agro-food, pharmaceutical and cosmetic industries. The products are mainly intended for export with the main destinations of the United States, the Netherlands, India, Singapore, Vietnam, Ghana, and Benin.

Local cashew processing is considered labour-intensive. The female workforce in rural areas forms the bulk of the employees of processing units at around 80%. This represents added value for the purchasing power of women and populations in rural cashew nut production areas. The project will serve as an effective brake on the rural migration of young people as it will improve the income of local populations. In addition, it will serve as an important lever in the fight against poverty in rural areas.

1.5 ESIA Objectives and Methodology

1.5.1 Overall methodology framework

ESIA objectives

The purpose of the ESIA is to identify and evaluate the significance of potential impacts on identified receptors and resources; to develop and describe mitigation measures that will be taken to avoid or minimize any potential adverse effects and enhance potential benefits, and to report the significance of the residual impacts that remain the following mitigation. The overall impact assessment (IA) approach is illustrated in Figure 1.1.

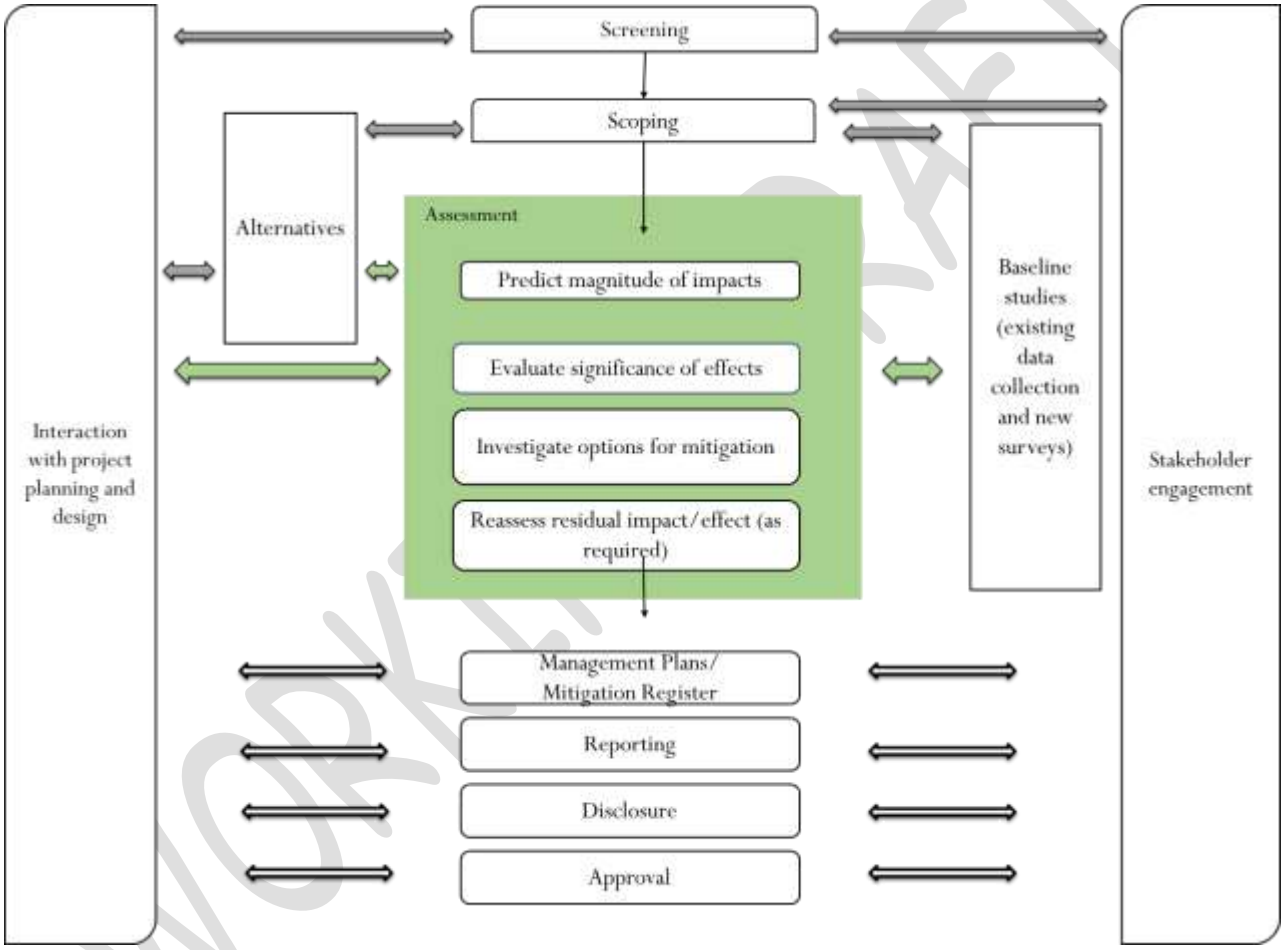


Figure 1.1: Environmental and Social Impact Assessment (ESIA) Approach Flow Chart

The screening and scoping phases allow for determining what Environmental and Social (E&S) standards apply to the Project, and what potential impacts related to the Project are likely to result in significant effects.

The impact assessment phase consists of an analysis of potential sources of impacts arising from the Project, together with an analysis of the sensitivity of the receiving natural and human environment. This draws from data captured through:

- baseline studies (to determine the sensitivity of the receiving environment); and
- interactions with the Project team, to develop a Project description, analyze how the Project may generate sources of E&S impacts, and (where relevant) analyze feasible alternatives to the Project.

Once impacts are analyzed and mitigation measures identified, those can be compiled under a management plan, which can be used as a framework for managing E&S impacts across Project life.

Note that stakeholder engagement is an important element of the ESIA process, from early screening / scoping to establishing and implementing management plans. This allows for:

- informing stakeholders on the Project;
- collecting appropriate information on the baseline environment;
- understanding the concerns and expectations of various stakeholders with regards to the Project, so that these can be accounted for in the ESIA, and addressed in the impact assessment and mitigation phase; and
- supporting the Project's public acceptance process by demonstrating an appropriate level of consideration of stakeholders' input in the Project's plan for managing environmental and social aspects.

Predicting the magnitude of impacts

The term 'magnitude' covers all the dimensions of the predicted impact on the natural and social environment including:

- the nature of the change (what resource or receptor is affected and how);
- the spatial extent of the area impacted or the proportion of the population or community affected;
- its temporal extent (i.e. duration, frequency, reversibility); and
- where relevant, the probability of the impact occurring as a result of accidental or unplanned events.

Table 1.1 provides definitions for the impact characteristics used in this assessment.

Table 1.1: Impact Characteristic Terminology

Impact Magnitude	
Type	**Direct –** impacts that result from a direct interaction between the project and resource/receptor. **Indirect** – impacts that follow from direct interactions between the project and its environment as a result of subsequent interactions. **Induced** – impacts that result from other activities that happen as a consequence of the project.
Extent	**Local** – impacts are limited to the Project area and the surrounding area. **Regional** – impacts that are experienced beyond the local areas to the wider region. **International** – impacts that are experienced at an international scale i.e. affecting another country.
Duration	**Temporary** – predicted to be short-lived, of the order of hours to weeks. **Short-term** - predicted to last only for the duration of the drilling or construction operations (i.e. up to approximately two years). **Medium-term** - predicted to last from two years to the end of the project life **Long-term** - predicted to continue beyond the project life but will cease in time. **Permanent** – impacts that cause a permanent change in the affected receptor or resource that endures substantially beyond the project lifetime.
Frequency	**Continuous –** impacts that occur continuously or frequently. **Intermittent –** impacts that are occasional or occur only under specific circumstances
Likelihood*	**Unlikely –** the event is unlikely but may occur during the project. **Possible –** the event is likely to occur at some point during the project. **Likely –** the event will occur during the project (i.e. it is inevitable).

* For unplanned events only.

Magnitude

Magnitude describes the actual change that is predicted to occur in the resource or receptor. An assessment of the overall magnitude of an impact, therefore, takes into account all the dimensions of the impact to determine whether an impact is of negligible, low, medium or large magnitude.

Sensitivity/Vulnerability/Importance of resources and receptors

The **significance** of the impacts resulting from an impact of a given **magnitude** will depend on the characteristics of the resources and receptors in terms of their **sensitivity, vulnerability** and **importance**.

The **quality** or **importance** of a resource will be judged by taking into account, for example, its national or international designation, its importance to the local or wider community, its ecosystem function or its economic value. The assessment of the sensitivity of human receptors, for example, a fishing community or wider social group, will consider their likely response to the change and their ability to adapt to and manage the effects of the impact.

Sensitivity, vulnerability and importance of resources and receptors are assessed based on the baseline data. Where required, specific criteria for assessing sensitivity are presented under the relevant impact assessment sections.

Assessing significance

All human activity imposes some level of change on the natural and social environment, because of physical interactions with natural systems or other human activities. To provide information to decision-makers and other stakeholders on the importance of different project impacts, the ESIA team evaluates the **significance** of each such change.

There is no statutory definition of **significance**. Therefore, in the ESIA, the evaluation of significance is based on the professional judgment of the ESIA team using objective criteria when available and informed by relevant legal standards, national and regional government policy, accepted industry good practices, and the views of relevant stakeholders. Where specific standards are either not available or provide insufficient information to allow grading of significance, evaluation of significance will take into account the magnitude of the impact and the quality, importance or sensitivity of the affected resource or receptor.

Magnitude and receptor **quality/importance/sensitivity** are assessed in combination to evaluate whether an impact is, or is not, significant and if so its degree of **significance** (defined in terms of *Minor, Moderate* or *Major).* Impacts ranked as *Negligible* include those that are slight or transitory and those that are within the range of natural environmental and social change. This principle is illustrated schematically in *Table 1.2*.

Table 1.2: Impacts significance matrix

		Sensitivity / Vulnerability / Importance of Resource/ Receptor		
		Low	**Medium**	**High**
Magnitude of Impact	**Negligible**	Negligible	Negligible	Negligible
	Low	Negligible	Minor	Moderate
	Medium	Minor	Moderate	Major
	Large	Moderate	Major	Major

The specific criteria used to evaluate the significance of each type of impact will be clearly defined in the impact assessment.

Context of Impact Significance

An impact of negligible significance is one where a resource/receptor (including people) will essentially not be affected in any way by a particular activity or the predicted effect is deemed to be 'imperceptible' or is indistinguishable from natural background variations.

- An impact of minor significance is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently low to be well within applicable standards (meaning applicable regulations and guidelines) or in the absence of applicable standards when the resource/receptor is of low sensitivity/ vulnerability/ importance.
- An impact of moderate significance has an impact magnitude that is within applicable standards but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. The emphasis for moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that impacts of moderate significance have to be reduced to a minor, but that moderate impacts are being managed effectively and efficiently.
- An impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resources/receptors. One of the aims of the ESIA is to get to a position where the Project does not have any major residual impacts or any impact that would endure into the long-term large area. However, for some aspects, there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied). An example might

be the visual impact of a facility. It is then the function of regulators and stakeholders to weigh such negative factors against the positive ones, such as employment, in deciding on the Project.

Mitigation measures

Impact assessment is designed to ensure that decisions on Projects are made in full knowledge of their likely impacts on the environment and society, but as important to identify measures that can be taken to ensure impacts are as low as technically and financially feasible.

For impacts that are initially assessed during the ESIA process to be of Major significance, a change in design is usually required to avoid, reduce or minimize these, followed by a reassessment of significance. For impacts assessed during the ESIA process to be of Moderate significance, where appropriate the discussion explains the mitigation measures that have been considered, the one selected and the reasons (e.g. in terms of technical feasibility and cost-effectiveness) for that selection. Impacts assessed to be of Minor significance are usually managed through good industry practice, operational plans and procedures.

The ESIA is intended to help decisions on projects to be made in full knowledge of their likely impacts on the environment and society. As noted below, the residual impacts and their significance reported in this report are based on the proposed DAI development as described, i.e. inclusive of all proposed mitigation.

Ranking of mitigation measures

- Avoidance at source

Develop the project such that the characteristic causing an impact is eliminated at the design stage (elimination of waste materials flow, for example).

- Reducing at source

Modify the design of the project or operational procedures to reduce the impact. For example, measures used to process effluent and waste materials fall into this category.

- Reducing at the receptor level

If an impact cannot be reduced on-site, measures can be implemented off-site (e.g. noise barriers to reduce noise impact at a nearby residence or fencing to prevent animals from straying onto the site).

- Repairing or correcting

Some impacts imply damage to a resource that is unavoidable (e.g. loss of agricultural land and forestry due to creating access, work camps or materials storage areas). Repair mainly involves restoration and re-establishment type measures.

- Compensation in kind

When other mitigation methods are either not possible or are not entirely efficient, compensation can be adapted, to a certain extent, to losses (e.g. planting to replace damaged vegetation, financial compensation for damaged crops or providing community facilities for loss of fisheries access, recreation and amenity space).

Reporting residual impacts significance

The degree of significance attributed to residual impacts indicates the level of importance that should be associated with each impact, in the decision-making process on the Project.

Residual impacts of Major significance, whether positive or negative, are considered to warrant substantial weight when compared with other environmental, social or economic costs and benefits; conditions will be expected to be imposed to control and, if necessary, monitor adverse impacts and deliver benefits.

Residual impacts of Moderate significance are considered to be of reduced importance to making decisions, but still warrant careful attention to conditions regarding mitigation and monitoring, to ensure the most appropriate (technically feasible and cost-effective) mitigation measures are used and to ensure benefits are delivered.

Residual impacts of Minor significance are brought to the attention of decision-makers but will be identified as warranting little if any weight in their decision; mitigation will be achieved using normal good practice and monitoring may be required to confirm that impacts are as predicted.

1.6 Scope of ESIA, Need and Desirability

This ESIA report covers the following elements of the cashew nut processing project at Boké:

- The raw cashew nut processing;
- The packaging of processed cashew kernels;

This ESIA is aimed at addressing the following lender requirements:

❖ International Standards and Guidelines:

- United States International Development Finance Corporation Standards and Guidelines
- International Finance Corporation (IFC) Performance Standards;
- World Bank Group (WBG) General Environmental Health and Safety (EHS) Guidelines;

- EHS Guidelines - Construction Materials Extraction, 2007;
- EHS Guidelines: Environmental Air Emissions and Ambient Air Quality, 2007;
- IFC Good Practice Handbooks and Notes:
- IFC Good Practice Note Addressing Grievances from Project-Affected Communities;
- Good Practice Note: Managing Contractors' Environmental and Social Performance
- All International Labour Organisation (ILO) conventions signed and ratified by Guinea, all ILO conventions covering core labour standards, and all ILO conventions covering the basic terms and conditions of employment;

❖ Good Practice Guidance

- Good International Industry Practice (GIIP);
- Stakeholder Engagement: A Good Practice Handbook for Companies doing Business in Emerging Markets;
- Good Practice Note on Contractor E&S Management;
- IFC's / EBRD Worker Accommodation: Processes and Standards
- IFC's Use of Security Forces: Assessing and Managing Risks and Impacts;
- UN Voluntary Principles on Security and Human Rights;
- Good Practice Note: Managing Risks Associated with Modern Slavery; and
- Addressing Gender-Based Violence and Harassment: Emerging Good Practice for the Private Sector.

1.7 Assumptions and Limitations

At the outset, it is necessary to outline overarching assumptions and limitations as follows.

1.7.1 Assumptions

The following assumptions have been made by Richflood in the preparation of this ESIA report:

- Baseline data have been collected over a limited period with resultant, spatial, temporal and scope gaps. It is assumed that DAI will address these gaps as part of its management commitments and once addressed will be incorporated into updated monitoring plans;
- That DAI will build upon the engagement conducted by Richflood during the ESIA, through implementation and engagement with stakeholders based on the stakeholder engagement plan and the associated grievance mechanism developed by Richflood, throughout the project lifecycle. Any additional study requirements that may arise as a result of stakeholder engagement during the ESIA process will be considered on a case-by-case basis;

- That DAI accepts and will implement the management commitments as contained in the ESIA and ESMP;
- That a monitoring and evaluation system, including auditing, using the framework provided in this report, will be established to track the implementation of the ESMP to ensure that management measures are effective to avoid, minimise and mitigate impacts; and that corrective action would be undertaken to address shortcomings and/or non-performances;
- That DAI and its contractors/consultants will adopt a process of continual improvement when managing and/or mitigating negative environmental impacts arising from the project. The ESMP will be used as the basis of environmental management and will be improved and refined regularly;

1.7.2 Limitations

The following limitations have been made by Richflood in the preparation of this ESIA report:

- The visit for the baseline survey was conducted in the first week of October, 2022 during the late rainy season, during which seasonal variations in the various taxonomic group which includes migratory species and flowering season of flora species could not be accounted for.
- The air quality baseline survey was conducted in October 2022, i.e. during the late wet season, when air quality (i.e. particulate matter) is less impacted by the Harmattan winds. Although the air quality during the wet season is expected to be significantly better (i.e. lower concentrations of particulate matter), for the ESIA the survey data, therefore, do not represent a worst-case scenario for ambient particulate matter concentrations and is thus considered acceptable;
- The impact assessment process integrates findings from various studies to ensure that baseline data, impact prediction and management measures complement rather than contradict. Every effort has been made by Richflood to maximise integration. However, due to the pace at which this ESIA/ESMP update has taken place, there may be areas within the report where integration has not been optimised.

1.8 ESIA Study Team

1.8.1 Site Surveys and Specialist Studies

The ESIA included site surveys undertaken from 2nd to 7th October 2022 to cover a number of baseline studies in the project's area of influence for the project. Where relevant, the results of the monitoring are reported in this report. The project timeframes did not however allow for detailed data collection and analysis, and where relevant, limitations in this regard are noted.

Richflood provided a team of specialists to conduct the fieldwork for all of the studies. The following specialist studies were conducted as part of ESIA:

- Air quality – baseline measurements;
- Biodiversity (terrestrial) – field investigation and desktop assessment;
- Groundwater – desktop and baseline measurements;
- Noise – baseline measurements;
- Socioeconomic including child labour Impact Assessment – household surveys and detailed assessment;
- Surface water – Desktop and baseline assessment;

Where standalone specialist study reports have been compiled, these are attached as appendices and are integrated into the body of the ESIA report.

1.9 Structure of the Report

This report is divided into fifteen chapters:

Chapter 1 Introduction

Introduces the project and the scope of this report.

Chapter 2 Institutional and Regulatory Framework

Provides the legislative and regulatory context for the project based on the relevant national and international requirements and guidelines

Chapter 3 Project Description

Describes the various elements of DAI's proposed project, including the processing plant and associated facilities

Chapter 4 Environmental and Social Baseline

Gives an overview of the affected biophysical and socio-economic environment in the area of the project.

Chapter 5 Potential Environmental and Social Impacts

Describes and rate the significance of the potential impacts identified, both before and after the successful implementation of the recommended mitigation measures.

Chapter 6 Environmental & Social Management Plan (ESMP)

Lists the recommended mitigation and management measures to mitigate negative impacts and enhance positive ones, for each phase of the project. Provides a plan for ongoing monitoring and management of environmental impacts, specifying timeframes, reporting requirements and responsibility for each measure

Chapter 7 Stakeholder Engagement

Describes the process of public consultation and disclosure adopted for the project and summarise the issues raised during such consultations. Also describes the mechanism for recording and addressing grievances raised by the public and stakeholders

Chapter 8 Summary and Conclusions

Summarises the key findings of the ESIA

Chapter 9 References

2 INSTITUTIONAL AND REGULATORY FRAMEWORK

2.1 Guinean Institutional Context

The food production industry activities in Guinea are regulated by the Ministry of Agriculture and Livestock and its dedication to national food security through collective intelligence and engineering. According to Decree D/2016/123/PRG/SGG of April 20, 2016, the Ministry of Agriculture and Livestock missions are:

- To design and develop legislation and regulations in agricultural matters and to ensure their application,
- To design, develop, implement and ensure the monitoring and evaluation of national agricultural development strategies,
- To promote the private sector in the development of agricultural production sectors,
- To design and implement agricultural development programs and projects and to monitor them,
- To ensure the establishment of hydro-agricultural infrastructure, rural buildings and agricultural tracks,
- To design and define lines of applied research in rural development and food security,
- To promote technology transfer, agricultural advice, supervision, support for rural women and the structuring of the rural world,
- To contribute to the achievement of food security,
- To design the agricultural map,
- To create a database on the agricultural sector,
- To support the emergence of a dynamic private sector for the production, supply and local distribution of agricultural inputs and equipment,
- To stimulate the development of agro-industrial and export crops,
- To ensure the maintenance of agricultural statistics,
- To strengthen the information and communication system at the level of actors in the agricultural sector,
- To ensure the protection of plants, information, awareness and education of the population on the subject,
- To ensure the rational management of natural resources in terms of land tenure security and soil fertility,
- To participate in the implementation of the regional economic integration policy,
- To participate in the establishment and strengthening of credit and savings structures adapted and accessible to producers and operators in the rural world,

- To put in place mechanisms for resolving farmer-herder conflicts,
- To participate in meetings, symposiums, conferences, seminars and sub-regional and international negotiations dealing with issues relating to the areas of competence of the Ministry,
- To take into account the environmental dimension in the programs and projects of the sector;
- To promote gender and equity in the activities of the sector.

2.1.1 Ministries relevant to the project

Environmental affairs are the responsibility of the Ministry of Environment and Sustainable Development (Ministère de l'Environnement et du Développement Durable). Other relevant ministries of the current Government of Guinea are:

- Ministry of Agriculture and Livestock (Ministère de l'Agriculture et de l'Elevage)
- Ministry of Urban Planning, Housing and Territorial Development (Ministère de l'Urbanisme, de l'Habitat et de l'aménagement du Territoire);
- Ministry of Trade, Industry and small-and-middle-sized Businesses (Ministère du commerce, de l'industrie et des petites et moyennes entreprises);
- Ministry of Health and Public Hygiene (Ministère de la Santé et de l'Hygiène Publique)
- Ministry of Infrastructure and transport (Ministère des Infrastructures et des Transports)
- Environmental Observation and Monitoring Centre (COSIE) (Centre d'observation et de surveillance de l'Environnement)
- National Directorate of the Environment (DNE) (Direction Nationale de l'Environnement)
- National Directorate of Sanitation (Direction Nationale de l'Assainissement)
- Guinea Electricity Company (Société de l'Electricité de Guinée) (EDG)
- Guinea Water Company (Société des Eaux de Guinée) (SEG)
- Guinean Bureau of Environmental Studies and Evaluations (BGEEE) (Bureau Guinéen des Etudes et Evaluations Environnementales)

2.2 Guinean Regulatory Framework Relevant to the Project

2.2.1 The Environment Code

The Environment Code or the Code for the protection and development of the environment (Ordinance No. 045/PRG/87 of 28 May 1987, as amended by Ordinance No. 022/PRG/89 of 10 March 1989 on the code of protection and enhancement of the environment) establishes the

administrative and legal framework enabling the Guinean State to deliver on its constitutional obligation to provide for a clean and healthy environment to every person in Guinea.

The Environment Code is the cornerstone of environmental protection and enhancement in Guinea. It sets out the fundamental legal principles to be complied with to ensure the protection of environmental resources and the human environment.

Article 73 of the Title IV of the code relates to the legal regime of classified installations for environmental protection and establishes the administrative and financial requirements applicable to classified facilities.

Article 82 of Title V of the code sets out that a project proponent must submit an environmental impact study to the relevant regulatory authority for projects, structures or installations that may, by their size or the nature of their activities, have an impact on the environment.

Article 83 provides for a Decree to establish a list of activities that require an environmental impact study and the content, methodology and procedure to follow concerning the environmental impact study: Decree n°199/PRG/SGG/89 of 18 November 1989.

2.2.2 Regulations on Environmental and Social Impact Assessment

Presidential Decree No.199/PRG/SGG/89 of 18 novembre 1989, made under Article 82 and 83 of the Environmental Code (Code de l'Environnement) (Décret présidentiel 199/PRG/SGG/89 du 18 novembre 1989 portant Codification des études d'impact sur l'environnement, pris conformément à l'article 82 et 83 du Code de l'environnement), sets out the projects requiring an environmental impact assessment (EIA) study. This decree lists the types of projects that require an EIA and the content of the EIA study.

Order No. 990/MRNE/SGG/90 of 31 April defines the content, methodology and procedure of the EIA study), and establishes the content, methodology, and procedures to be complied with when carrying out an environmental impact assessment.

This content is also specified in the General Guide for Impact Studies (February 2013). Environmental impact studies must contain the following information:

- A brief description of the Project with its particular purpose(s); its geographical location; an estimate of its cost of implementation; the date on which the investment decision was taken and the timetable of the Project.
- A description of the environmental and social baseline situation of the site, on aspects likely to be affected by the Project such as sites, natural resources, landscape and socio-economic and cultural conditions. The aspects to be covered in the Project include geology and soils,

hydrogeology, hydrology, fauna and flora, landscape and visual aspects, air pollution and noise, traffic and infrastructure, social and socioeconomic status.

- An analysis of the Project's impacts on the environment, particularly on the landscape and visual aspects; on the flora and fauna, natural habitats and biological balances and, where appropriate, the nuisances (noise, vibration, odour, etc.), hygiene and public health, and cultural heritage.
- A description of the Project's alternatives and the rationale for choosing the proposed Project. This section shall in particular justify the choice of site and various production processes.
- A detailed description of the measures envisaged by the developer to eliminate, reduce or mitigate the adverse effects of the Project and the estimated expenditure for implementing such measures.

The General Guide for Impact Studies (February 2013) has also clarified the approval process of the ESIA. This procedure is shown in Figure 2.1. The entire submission and permitting procedure is managed by the Bureau Guinéen des Etudes et Evaluations Environnementales (BGEEE – the Guinean environmental directorate). A formal review of the permitting documentation is undertaken by the Comité Technique d'Approbation Environnementale (CTAE), an ad-hoc multi-disciplinary team composed of representatives of various ministries relevant to the Project. The final environmental compliance certificate is issued by the Ministry in charge of the environment. Final approval is under the responsibility of the ministry in charge of the Project – in the case of Endeavor, the ministry of energy and hydraulics. Obtaining the environmental compliance certificate is a prerequisite to applying for certain other operational permits required for the Project, such as building permits or import and storage of hydrocarbons permits.

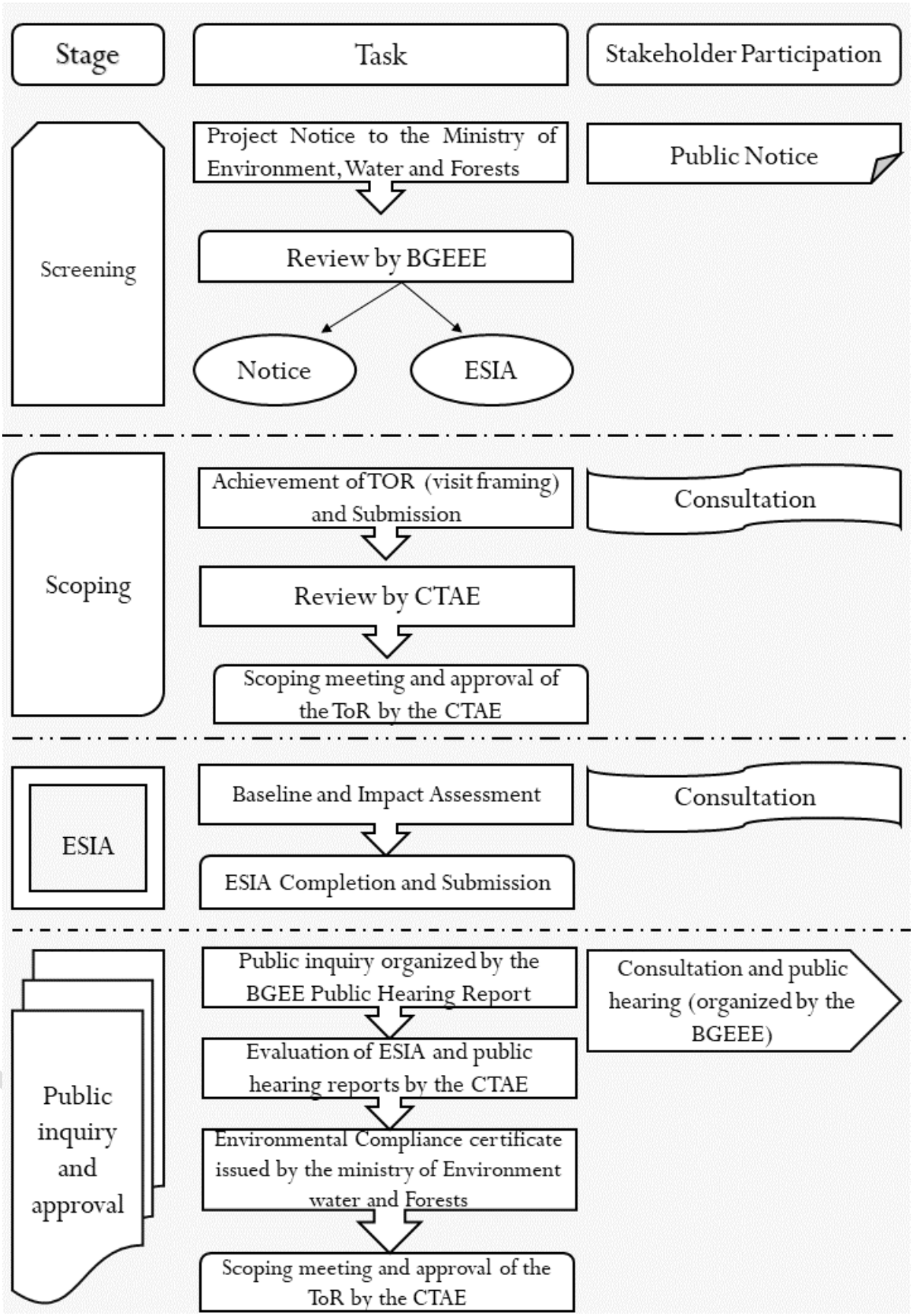


Figure 2.1 Overview of ESIA development and approval process in Guinea

2.2.3 The classified installations for Environmental Protection

Presidential Decree n°200/PRG/SGG/89 of 8 November 1989 (promulgated under Article 73 of the Environmental Code) relating to the legal regime of classified installations for environmental protection establishes the administrative and financial regime applicable to classified facilities.

Classified facilities are facilities that, due to the nature of their activities or the actual volume of activities, require special authorization under Guinean law on the environment. Order n°93/800/PRG/SGG of 22 October 1993 lays down the technical nomenclature of classified installations for environmental protection and lists all industrial activities under the Presidential Decree 200/PRG/SGG/89 and for which an integrated permit is required. This order sets for each industrial activity threshold that reflect the level of potential damage resulting from the activity and from which different requirements apply. Industrial sites are classified as sites of class I or class II according to the level of damage to the environment.

Article 2 of Presidential Decree n°200/PRG/SGG/89 requires the owner or operator of a classified installation to present its request for environmental authorization at the same time as the request for a building permit. In accordance with Article R221-1 of the Urban Code (Law L/98 No 17/98 of 13 July 1998), a building permit must be obtained before the construction of any building. However, this permission can only be obtained after obtaining environmental authorization for a classified facility.

2.2.4 Regulatory Framework on Land

In Guinea, the land law has several objectives:

- To exercise control over the development process using permissions development/building permits, this must be obtained from the local planning authorities before development can take place. In most cases, a building permit can only be achieved if the government made a favourable decision for the Project under the Environmental Impact Assessment process.
- To protect the environment through conditions, agreements, etc. related to environmental protection in a grant of development permission, via, for example, the need to obtain an environmental permit (also called authorization for classified installations) before production can begin.

2.2.4.1 Land and Estate Code (« Code Domanial et Foncier »)

Ordinance n°O/92/019 of 30 March 1992 establishes the Land and Domanial Code. The Land and Domanial Code deals primarily with property registered and details the registration process with titles, leases and deeds. It defines two procedures for land registration:

- Through the land plan: it is an administrative document, and not a title in itself, which is kept at the municipal level in the cities and the community for rural development in rural areas.
- Through the registration of land ownership: this leads to the issuance of a freehold. The document will be kept in the service of conservation of land title.

The 1992 Guinea Land Code (Code Foncier et Domanial) introduced an elaborate land privatization and registration system – at least on paper. The code affirms state ownership of vacant land and grants individuals the right to own land. Land ownership is established through land registration

In practice, these procedures of land registration have not been fully implemented in rural areas, where customary rights (« droits coutumiers ») predominate; in the absence of formal private property, the land is essentially state property.

2.2.5 Forestry Code

Guinea's Forestry Code, 1999 (Loi L/99/013/AN portant Code Forestier), governs the country's forests. The Code also establishes guides for the protection of the national forests and the management of its key resources. The Code recognizes the need to engage the rural population in a participatory management process for both classified and community forests, and the right for communities to manage forests through local forest associations. It devolves control of the forest to the country's elected rural councils, supported by forestry service representatives. The Code recognizes the need for forest management plans (plans d'aménagement) to be prepared in collaboration with the local population and calls for the transformation of forest service agents from enforcers to advisors

2.2.6 Urban Planning Code

Law L/98 n° 017/98 of 13 July 1998 adopting and promulgating the Law on Planning Code of the Republic of Guinea (also known as the Urban Planning Code) sets out the responsibilities of the Guinean State in the management and development of the country. This control is exercised by the Minister of Urban Planning who drafts the National Planning Scheme (Schéma National d'Aménagement du Territoire - SNAT), and the Regional Development Plans (Plan de Développement et d'Aménagement Régional - PDAR) that provide to different levels of government the tools to influence urban development.

In addition to the Urban Planning Code, the Government of Guinea issued the Declaration of Rural Land Policy (Decree D / 2001/037/PRG), which aims to promote rural economic and social

development by guaranteeing property rights and rules favourable to agricultural development in rural areas, improving the sustainable management of resources and allowing the development of a market for a transparent and fair land. This decree is the strategic framework for the management of rural land.

2.2.7 Local Government Code

At a local level, the Local Government Code ("Code des Collectivités Locales"), relating to the devolution of powers from central government, defines the powers, duties, and active fields as well as the limits of community action in local communities.

This Code sets out the roles and responsibilities of local communities in the management of land use. As such, the municipality must give an opinion before any project investment and before any occupation/land use. Local communities share responsibility for the management of land use with the state.

2.2.8 Specific Environmental Legislation

2.2.8.1 Biodiversity Code

Regulation on the protection of species is defined in the Code for the Protection of Wildlife and Hunting Regulations (Law L/97/038/AN of 9 December 1997 adopting and promulgating the Code of protection of wildlife and rules for hunting). This Code sets out the legal framework for the protection, conservation and management of wildlife and flora, and their habitats; and provides for the recognition of the right to hunt. It also describes certain rules concerning hunting and aims to promote the sustainable use of species and ensure their sustainability for the satisfaction of human needs. This Code and its interaction with the ESIA legislation is currently the cornerstone of the protection and enhancement of biodiversity in Guinea.

2.2.8.2 Wildlife Code

Wildlife Code (Loi L/99/038/AN), enacted in 1998, sets out the policy on the protection of wildlife and their habitats as well as the regulation of hunting of unprotected species; the Environmental Protection Law (Code de la Protection et de la Mise en Valeur de L'environnement, Ordonnances N°045/PRG/87 et N°022/PRG/89), which seeks to combine the protection of the environment with sustainable development of natural resources; and the Decentralization Law (Loi Portant Code des Collectivités Locales en République de Guinée), which defines the legal regime and rights of local collectives. Guinea is a signatory to several international agreements on environmental practices and policies.

The Code is supported by a National Policy on flora and fauna, setting conservation goals and an action plan for their conservation, rehabilitation and development. In addition, the Code states that certain species of flora and fauna are a national resource that must be protected. It lists species that must be fully protected or partially protected. In addition, there are several policy actions in favour of biodiversity, including:

- National Action Plan for the Environment;
- National Forestry Action Plan;
- Mangrove Forest Management Plan;
- Scholarship Program in the energy sector; and
- National Program for Sustainable Human Development.

2.2.8.3 Air emissions

The following Guinean Standard defines the air emission limits: NG 09-01- 011:2012 / CNQ: 2004 relating to new standards for air pollutant emissions (Norme Guinéenne NG 09-01-011:2012 / CNQ: 2004 Sur la Pollution Atmosphérique– Rejet).

These texts apply to any new and existing fixed or mobile installation that emits atmospheric emissions (including vehicles).

The texts require that anyone that operates or intends to build a facility that emits air pollutants shall provide the competent authority with the following information:

- the nature and quantity of emissions;
- location and height of the point of discharge; and
- other characteristics of the discharge, are needed to estimate emissions.

In addition, limits for air quality standards are set. These are summarized in Table 2.1.

Table 2.1: Air quality standards: Guinean directives

Pollutants	Guinean Limits	Statistical definitions
SO_2	50 µg/m^3	Yearly average
	125 µg/m^3	Daily average
NO_2	40 µg/m^3	Yearly average
	200 µg/m^3	Hourly average
CO	30 µg/m^3	Daily average

Pollutants	Guinean Limits	Statistical definitions
PM_{10}	80 µg/m^3	Yearly average
	260 µg/m^3	Daily average
$PM_{2.5}$	65 µg/m^3	Yearly average

Table 2.2: Emission limits for stationary combustion units: Guinean directives

	Guinean standards (draft)	
Pollutants	**Heavy Fuel**	**Diesel (DO)**
CO	650 mg/Nm^3	450 mg/ Nm^3
NO_X	300 mg/ Nm^3	165 mg/Nm^3
SO_2	2,000 mg/ Nm^3	-
Dust / Particulate Matter (PM)	50 mg/ Nm^3	50 mg/ Nm^3

2.2.8.4 Noise emissions

Guinea currently does not have any specific national standards and procedures for the regulation of noise. However, there is a Ministerial Order on noise regulation (Arrêté Ministériel fixant la réglementation du bruit en République de Guinée) currently under development. At this stage of the Project, only a draft of the national regulation on noise is available.

The Ministerial Order on noise regulation (Arrêté Ministériel fixant la réglementation du bruit en République de Guinée) defines different noise levels for a specific period of the day and type of areas, as detailed in Table 2.3.

The Guinean regulation recalls the IFC noise limits for night time, 45 dB(A) for residential areas and 70 dB(A) for industrial areas. For daytime, instead, it establishes a more stringent limit of 50 dB(A), and also defines an additional sensitive time between 13:00 and 15:00, for which a 5 dB(A) lower threshold is recommended (45 dB(A)).

Table 2.3 Ambient noise levels: proposed Guinean standards

Period	Maximum Ambient Noise Level 1-hour Leq [dB(A)]		
	Guinean standards		
	Class 1 Residential area	Class 2 Commercial area	Class 3 Industrial area
6:00 – 13:00	50	55	
13:00 – 15:00	45	50	

Period	Maximum Ambient Noise Level 1-hour Leq [dB(A)]		
	Guinean standards		
	Class 1 Residential area	Class 2Commercial area	Class 3 Industrial area
15:00 – 22:00	50	55	70
22:00 - 6:00	45	50	

2.2.8.5 Water Code

The Water Code (Code de l'Eau) (Law L/94/005/CRTN of 14 February 1994) establishes a system of water use rights and sets the overall framework for managing water resources. The Code states that a concession is granted by decree for permanent water uses, such as supplying potable water to towns and villages, hydropower, agricultural, industrial or other developments, requiring investments whose amortization period exceeds 10 years.

The Code states that any use of water resources must comply with the guidelines of the development plan of the watershed containing these resources. The Code also addresses the prevention of harmful effects on water and the protection of water quality.

The Code addresses groundwater issues, and more specifically the measures governing the exploration, exploitation and protection of groundwater sources. The arrangements for establishing protection perimeters, defining water resource safeguard areas and issuing drilling permits are determined by the National Directorate for Hydraulics (Direction Nationale de l'Hydraulique-DNH).

In addition, there are a Ministerial Order on wastewater discharges (Projet d'arrêté Ministériel fixant les conditions de rejets des eaux usées) and a Guinean Standards: NG 09-01-010:2012 / CNQ:2004 relating to new standards for waste water discharges (Norme Guinéenne NG 09-01-010:2012 / CNQ:2004 Rejet des Eaux Usées). The requirements are the following.

Some discharges such as liquid effluent causing stagnation, nuisances to the neighbourhood, and pollution of surface water, groundwater or marine water are completely forbidden. Treated effluent discharged into a receiving environment, must comply with the specified values.

An authorization order from the Minister for the Environment, Water and Forests (Ministre de l'Environnement, des Eaux et Forêts) and the Directorate responsible for Classified Installations will set the maximum daily discharge flow rate. When the authorized maximum daily rate exceeds 1 / 10th of the nominal flow of the river or if it is greater than 100 m3/day, the authorization order will also set a limit on the monthly average daily flow and an instant limit.

The operators of classified installations, who are authorized to discharge substances mentioned above, must send annual reports to the Ministry for the Environment summarizing:

- discharge flow rates; and
- discharge concentrations.

The wastewater discharged into the natural environment must comply with the limits described in Table 2.4, depending on the maximum daily flow allowed.

Table 2.4: Effluent quality parameters before discharge in the environment

Parameters	Guinean limits for wastewater discharge
pH	5.5-9
Temperature	<30°C
COD	<200 mg/L if the daily flow rate is ≤30 L/day <100 mg/L if the daily flow rate is >30 L/day
TSS	<15 mg/L (specific limit for the mining industry)
Biochemical Oxygen Demand (BOD)5	<200 mg/L if the daily flow rate is ≤100 kg/day <100 mg/L if the daily flow rate is >100 kg/day
Total nitrogen	<30 mg/L as monthly average concentration if the daily flow rate is ≥50g/day A different value can be fixed by the operating permit
Total Phosphorus	<10 mg/L as monthly average concentration if the daily flow rate is ≥15kg/day A different value can be fixed by the operating permit
Total hydrocarbon	15 mg/L if the daily flow rate is ≥150g/day

2.2.8.6 Waste Management

General requirements for waste management are set by the Guinean Code de l'Environnement (Art 58 to 67). Waste has to be treated adequately to avoid any risk to the environment or human health. Disposal of waste into freshwater or marine water is forbidden without prior authorization by the environmental authorities.

The Bamako convention on the Ban of the Import into Africa and the Control of Transboundary Movements and Management of Hazardous Wastes within Africa is dated 30 January 1991. It is a treaty of African nations prohibiting the import into Africa of any hazardous (including radioactive) waste. The convention came into force in 1998. Guinea, as a Member of the African Union, has signed the Convention.

The convention constitutes an important stage of the construction is a treaty in terms of environmental protection. In line with the Basel Convention of 22 March 1989, its principal objective is to limit the circulation of dangerous wastes on the African territory. The Bamako convention uses a format and language similar to that of the Basel convention, but it is much stronger in prohibiting all imports of hazardous waste and it does not make exceptions on certain hazardous wastes (like those for radioactive materials) made by the Basel convention. To summarize, the convention has the following purposes:

- prohibit the import of all hazardous and radioactive wastes into the African continent for any reason;
- minimize and control transboundary movements of hazardous wastes within the African continent;
- prohibit all ocean and inland water dumping or incineration of hazardous wastes;
- ensure that disposal of wastes is conducted in an “environmentally sound manner"; and
- establish the precautionary principle.

2.2.9 Specific Social Legislation

Additional Guinean regulations exist regarding the issues of hiring and training workers, as well as health and safety at work:

- Law N°L/2014/072/CNT of 10 January 2014 repealing and replacing the Labor Code of 28 July of 1988 (Ordonnance n° 003/prg/ sgg/ 88 du 28 janvier 1988 portant institution du code du travail). Provisions of regulatory texts adopted in application of the 1988 ordinance that does not conflict with the new Labor Code are not repealed ;
- law of 14 February 1994 establishing a Code of Social Security Act; and
- the Public Health Code of 19 June 1997 and its application Decree.

2.2.9.1 The Labor Code

Law N°L/2014/072/CNT of 10 January 2014 is the main source of legislation governing employment practices and labour relations in Guinea. This Code applies to all private-sector employees. It prohibits forced or compulsory labour. It establishes the rules of recruitment and termination of employment; the rules relating to working conditions, including wages, maximum hours worked and overtime; the employee benefits such as paid leave and retirement. The Code also defines the requirements for the employees’ health and safety.

2.2.9.2 Workers Health and Safety

The primary document in Guinea that addresses protection of worker health and safety is the Law N°L/2014/072/CNT of 10 January 2014 repealing the Labor Code of 1988. The Code includes the following relevant articles:

- the employer must follow all useful measures to protect the health and safety of its employees;
- all heads of establishments must organize practical training in safety and hygiene;
- the Minister of Labor determines, via Orders, all work that must not be performed by women, apprentices and workers under 18 years of age (Order 1392);
- the Hygiene and Safety Plan must be communicated to the work inspector before work begins;
- all employment candidates must undergo a medical examination at the expense of the employer, who must also ensure an annual medical follow-up of all employees; and
- lists the medical facilities and services that must be provided by companies depending on the number of employees.

2.2.9.3 Social Protection

Law L/94/006/CTRN of 14 February 1994 establishing a Code of Social Security Act is the main source of Guinean legislation governing the protection of workers and their families against economic or social poverty and the difficulties arising from a significant loss of income. This text deals with the legal status and financial organization of the Social Security Fund, pensions for old-age, invalidity and survivors, occupational risk prevention, family benefits, sick leaves, health and social work, and provisions relating to litigation and penalties.

It repeals the Social Security Code established by Law L/94/006/CTRN of 12 December 1960.

2.2.9.4 Public Health

The Public Health Code (Act L/97/021/AN of 19 June 1997 on the Code of Public Health) ensures the protection and promotion of health, the rights and obligations of the individual, family and community throughout the territory of the Republic of Guinea.

Decree D/253/24/PRG on health at work creates a National Service of Occupational Medicine in the Department of Health and Public Hygiene and defines the role and responsibilities of this department.

2.2.9.5 The Investment Code

The Investment Code, decreed by Order N° 001/PRG of 3 January 1987 and modified by Law L/95/029 CMRN of 30 June 1995, establishes the guarantees afforded to investors and the advantages of different regimes and also defines their obligations. Investors are required to employ equally, as a priority, all Guinean nationals with equal qualifications and to organize training and the promotion of Guinean nationals within the company. A new Investment Code was adopted in May 2015 (Law /2015/n°008 of 25 May 2015).

2.2.9.6 Guinea Child Code

The Child Code Law L/2008/011/AN of August 19, 2008 promulgated by the President of the Republic of Guinea stated that The best interests of the Child must be the primary consideration in all measures taken with regard to the child by public or private institutions, Courts or administrative authorities. This Code establishes conventionalization and the procedure of non-incrimination through mediation as well as the participation of the Services and Institutions concerned by Childhood in decision-making and in the choice of measures compatible with the best interests of the child. A child has the right to continue to benefit from the various living conditions, and services adapted to their needs, their age and corresponding to the normal family environment.

2.2.9.7 Law on Child Labour

Order no 2791/MTASE/DNTLS/96 relating to the work of children, considering Decree D/94/078/PRG/SGG of August 23, 1994, on the Composition Partial of the Government supplemented by Decree D/94/079/PRG/SGG of 26 August 1994; Decree D/94/115/PRG/SGG of November 3, 1994, relating to attributions and Organization of the Ministry of Labour, Social Affairs and Employment; This code determines the working conditions of employees under the age of 18year and listed prohibited works for young workers under the age of 18 (*see details as contained in Annex*).

2.3 International Conventions and Protocols

In addition to its national laws, Guinea is a party to a number of international conventions and regional agreements on environmental and social issues (see Table 2.5). The signing of a convention is the first step. Ratification is the step where the country takes specific legal steps to implement the convention.

Table 2.5: International Conventions and Treaties

Convention	Date of Ratification/ Accession	Key Objectives
Convention on Climate Change	Guinea ratified the Convention in May 1993 and it entered into force in March 1994.	Since 1992, 192 countries around the world have joined an international treaty, the United Nations Framework Convention on Climate Change that sets general goals and rules for confronting climate change. The ultimate objective of the Convention is to stabilize greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system. The Convention provides that countries must meet the Convention objectives primarily through national measures.
Kyoto protocol to the United Nations Framework Convention on Climate Change	Guinea ratified the Kyoto protocol in September 2000. It entered into force in February 2005.	This Protocol was ratified by the Guinean Government in 2000 and it came into force in February 2005. Guinea is not an Annex I Party to the Protocol and therefore does not, currently, have to meet a specific greenhouse gas emission reduction target. There is currently no Guinean specific legislation implementing the Kyoto Protocol in Guinea.
Vienna Convention for the Protection of the Ozone Layer	Guinea ratified the Vienna Convention in June 1992 and the Convention came into force in September 1992.	Guinea ratified the Vienna Convention and the Montreal Protocol. The Convention provides for the international legal framework to protect the ozone layer. Guinea has not, to date, adopted specific legal instruments to implement the Convention in its legal system.

Convention	Date of Ratification/ Accession	Key Objectives
The Montreal Protocol on Substances that Deplete the Ozone Layer	Guinea ratified the Montreal Protocol in June 1992.	The Montreal Protocol on Substances That Deplete the Ozone Layer (a protocol to the Vienna Convention for the Protection of the Ozone Layer) is an international treaty designed to protect the ozone layer by phasing out the production of a number of substances believed to be responsible for ozone depletion. The treaty was opened for signature on 16 September 1987, and entered into force on 1 January 1989. The Protocol provides for the international legal framework to protect the ozone layer by setting out phasing-out targets and schedules for named substances listed in the Protocol.
Convention on the Conservation of Migratory Species of Wild Animals	Guinea is a party to this Convention which came into force in August 1993.	The convention aims to ensure the conservation of Migratory Species and Natural Environment by an intergovernmental co-operation. The convention sets out to conserve wild flora and fauna and their natural habitats; promote co-operation between states; monitor and control endangered and vulnerable species; and to assist with the provision of assistance concerning legal and scientific issues. This convention was transposed into Guinean legislation via the Guinean Code of Protection of Wildlife and Rules of the Hunt.
Convention on Biological Diversity	Guinea ratified this Convention in May 1993.	The objective of this Convention is to develop national strategies for the conservation and sustainable use of biological diversity. It is often seen as the key document regarding sustainable development. The Convention has three main goals: conservation of biological diversity (or biodiversity); sustainable use of its components; and fair and equitable sharing of benefits arising from genetic resources. This Convention has been transposed at a national level in Guinea with the Code of Protection of Wildlife and Rules of the Hunt.

Convention	Date of Ratification/ Accession	Key Objectives
African Convention for Nature Conservation and the Conservation of Natural Resources	Guinea signed this Convention in September 1968, but has yet to ratify it.	This Convention aims for the conservation and rational use of soil, water, flora and fauna resources. The objectives of this Convention are: to enhance environmental protection; to foster the conservation and sustainable use of natural resources; and to harmonize and coordinate policies in these fields with a view to achieving ecologically rational, economically sound and socially acceptable development policies and programs.
Convention concerning the Protection of the World Cultural and Natural Heritage	Guinea ratified this Convention in March 1979.	This Convention aims to protect the world cultural and natural heritage. This Convention provides for the creation of an intergovernmental committee for the protection of the world cultural and natural heritage and its associated fund.
Ramsar Convention on Wetlands of International Importance	Signed and ratified by Guinea	The Convention on Wetlands of International Importance, called the Ramsar Convention, is an intergovernmental treaty that provides the framework for national action and international cooperation for the conservation and wise use of wetlands and their resources. The Convention uses a broad definition of the types of wetlands covered in its mission, including lakes and rivers, swamps and marshes, wet grasslands and peatlands, oases, estuaries, deltas and tidal flats, near-shore marine areas, mangroves and coral reefs, human-made sites such as fish ponds, rice paddies, reservoirs, and salt pans. Guinea signed and ratified this Convention and it came into force in March 1993. Guinea has submitted national reports on the implementation of the RAMSAR Convention in Guinea which show that the Guinean government has taken some steps to implement the Convention.

Convention	Date of Ratification/ Accession	Key Objectives
Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal	Guinea has acceded to but not ratified the Convention in April 1995	The Basel Convention on the Control of Transboundary Movements of Hazardous Wastes and their Disposal was adopted on 22 March 1989 in Basel, Switzerland, in response to a public outcry following the discovery, in the 1980s, in Africa and other parts of the developing world of deposits of toxic wastes imported from abroad. The overarching objective of the Basel Convention is to protect human health and the environment against the adverse effects of hazardous wastes. Its scope of application covers a wide range of wastes defined as "hazardous wastes" based on their origin and/or composition and their characteristics, as well as two types of wastes defined as "other wastes" - household waste and incinerator ash.
Convention to Combat Desertification (A/AC.241/27)	Guinea ratified this Convention in June 1997.	The objective of this Convention, which came into force in December 1996, is to combat desertification and mitigate the effects of drought in countries experiencing serious drought and/or desertification, particularly in Africa. The Convention aims to achieve this through effective action at all levels, supported by international cooperation and partnership arrangements, in the framework of an integrated approach which is consistent with Agenda 21, with a view to contributing to the achievement of sustainable development in affected areas. Guinea has also produced a national action plan against desertification. The aims and objectives of the Convention have been incorporated into existing legislation such as the Environmental Code, the Mining Code *etc*.
World Heritage Convention (UNESCO)	The Convention came into force in 1975. Guinea ratified the Convention in	The Convention aims to promote cooperation among nations to protect the world's natural heritage and cultural properties that are of such outstanding universal value that its conservation is important for current and future generations. It defines the kind of natural

Convention	Date of Ratification/ Accession	Key Objectives
	March 1979.	or cultural sites which can be considered for inscription on the World Heritage List; and sets out the duties of States Parties, of which Guinea is one of, in identifying potential sites and their role in protecting and preserving them. By signing the Convention, each country pledges to conserve not only the World Heritage sites situated on its territory, but also to protect its national heritage. The *Mount Nimba Strict Nature Reserve* was established by Decree in 1944 and declared as a biosphere reserve in 1980. Guinea has listed the *Mount Nimba Strict Nature Reserve* on the list of world heritage in danger in 1992. The Guinean government has also listed the cultural landscape of the *Mount Nimba* range on the tentative list of cultural sites to be protected under the Convention.
ILO Convention 87 on Freedom of Association and Collective Bargaining, Convention 1948	Guinea ratified Convention 87 in January 1959.	The Freedom of Association and Protection of the Right to Organize Convention, 1948 (No. 87) establishes the right of all workers and employers to form and join organizations of their choosing without prior authorization and lays down a series of guarantees for the free functioning of organizations without interference by the public authorities.
ILO Convention 98 on Right to Organize and Collective Bargaining Convention 1949	Guinea ratified Convention 98 in March 1959.	The Right to Organize and Collective Bargaining Convention 1949 (98) provides for protection against anti-union discrimination, for protection of workers' and employers' organizations against acts of interference by each other, and for measures to promote and encourage collective bargaining.
ILO Convention 111	Guinea ratified Convention	The Convention on the Elimination of Discrimination in Respect of Employment and

Convention	Date of Ratification/ Accession	Key Objectives
on Elimination of Discrimination in Respect of Employment and Occupation	111 in September 1960.	Occupation provides that member states pursue a national policy designed to promote, by methods appropriate to national conditions and practice, equality of opportunity and treatment in respect of employment and occupation, with a view to eliminating any discrimination in respect thereof.
ILO Convention 182 on Worst Forms of Child Labor 1999	Guinea ratified Convention 182 in June 2003.	The Worst Forms of Child Labor Convention 1999 provides that each member who ratifies the Convention must take immediate and effective measures to secure the prohibition and elimination of the worst forms of child labour as a matter of urgency. This includes slavery, trafficking, prostitution and pornography, forced labour and recruitment into the militia, as well as occupations that harm the child's safety, morals or health.

2.4 International Best Practices, Standards and Guidelines

The Project design and recommended mitigation will endeavour to uphold international best practices and maintain or reduce impacts to ALARP (as low as reasonably practical) levels. The following international requirements and standards have been considered within the ESIA process and are described below;

- IFC Performance Standards (PS) on Environmental and Social Sustainability, 2012;
- IFC/World Bank Group (WBG) International Environmental Health and Safety (IEHS) Guidelines:
- EHS Guidelines - Construction Materials Extraction, 2007;
- EHS Guidelines: Environmental Air Emissions and Ambient Air Quality, 2007;
- IFC Good Practice Note Addressing Grievances from Project-Affected Communities;
- IFC Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets;
- IFC Workers' Accommodation: Process and Standards;
- IFC Good Practice Handbook: Use of Security Forces: Assessing and Managing Risks and Impacts;
- IFC Good Practice Handbook: Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets;
- IFC Good Practice Note: Managing Risks Associated with Modern Slavery;
- IFC Good Practice Note: Addressing Gender-Based Violence and Harassment (GBVH) Emerging Good Practice for the Private Sector;
- Good Practice Note: Managing Contractors' Environmental and Social Performance

2.4.1 United States International Development Finance Corporation Standards and Guidelines

U.S. International Development Finance Corporation (DFC) is America's development bank. DFC partners with the private sector to finance solutions to the most critical challenges facing the developing world today. DFC invests across sectors including energy, healthcare, critical infrastructure, and technology projects. DFC also provides financing for small businesses and women entrepreneurs to create jobs in emerging markets. DFC investments adhere to high standards and respect the environment, human rights, and worker rights.

The guiding environmental and social policies and procedures are based in large part on environmental and social impact assessment procedures applied by organizations such as the World

Bank Group, the European Bank for Reconstruction and Development, the Inter-American Development Bank, and the U.S. Export-Import Bank, among others.

DFC's business lines work closely with the Office of Development Policy to determine a project's eligibility for DFC support. Each potential project is subject to a full policy review. Thorough, accurate, and complete information in the application and supplemental materials, such as a business plan, help expedite DFC's project review.

All projects and Subprojects are categorized as Category A, B, C or D based on environmental and social factors. DAI Cashew-nut processing project is classified in Category B, because its potentially adverse environmental impacts on human populations or environmentally important areas are less adverse. This impact is site-specific in which mitigatory measures can be designed more readily. Companies must meet the requirements of the IFC's Performance Standards. Included within this requirement are the risk and impact identification requirements of Performance Standard 2, which requires (1) Identification of all relevant environmental and social risks of the Project including issues identified in Performance Standards through 8; (2) Identification of all factors that define the Project's Area of Influence; and (3) Identification of groups and communities that may be directly or indirectly affected by the Project (i.e., Project Affected People), including groups and communities that may be differentially or disproportionately affected by the project because of their disadvantaged or vulnerable status. The process of identifying risks, impacts, Area of Influence and Project Affected People shall be adequate, accurate, objective and appropriate to the severity of Project risks and the significance of Project impacts.

2.4.2 International Finance Corporation Performance Standards

Diaoune Agro-Industrie SARL is expecting that the Project will be financed with the participation of international financial institutions (IFIs). Such IFIs will likely require the Project to comply with applicable international environmental and social sustainability standards. The most widely accepted international standards are the International Finance Corporation's Environmental and Social Performance Standards (2012) or IFC PS. The International Finance Corporation (IFC) is a subsidiary of the World Bank Group dedicated to supporting private sector growth in developing countries. The IFC's Sustainability Framework (updated 1 January 2012), is widely considered one of the most complete sets of standards for environmental and social management.

The IFC Performance Standards are a central element of this framework. There are eight Performance Standards (PS) that the private entity is expected to meet throughout the life of an investment by IFC:

Figure 2.2: Overview of IFC Performance Standard

Source: www.ifc.org

Throughout the project, some performance standards will be triggered and must be managed in a manner consistent and compliant with the World Bank's Guidelines.

Table 2.6: Summary of International Finance Corporation Performance Standards and how they are addressed in this ESIA

IFC PS	Objectives	How this ESIA addresses it
Performance Standard 1: Assessment and Management of Environmental and Social Risks and Impacts	PS 1 underscores the importance of managing environmental and social performance throughout the life of a project. PS 1 requires the client to conduct a process of environmental and social assessment and to establish and maintain an Environmental and Social Management System (ESMS), appropriate to the nature and scale of the project and commensurate with the level of its environmental and social risks and impacts. PS1 aims to: Identify and evaluate environmental and social risks and impacts of the project; Adopt a mitigation hierarchy to anticipate and avoid, or where avoidance is not possible, minimise, and, where residual impacts remain, compensate/offset for risks and impacts to workers, affected communities, and the environment; Promote improved environmental and social performance of clients through the effective use of management systems; Ensure that grievances from affected communities and external communications from other stakeholders are	To comply with the IFC requirements of PS 1 for the effective management of grievances and stakeholder engagement for the proposed project, a number of site-specific management plans including but not limited to, stakeholder engagement, grievance redress mechanism, and waste management have been incorporated in this ESIA.

IFC PS	Objectives	How this ESIA addresses it
	responded to andmanaged appropriately; • Promote and provide means for adequate engagement with affected communities throughout the project cycle on issues that could potentially affect them; and • Ensure that relevant environmental and social information isdisclosed and disseminated.	
Performance Standard 2: Labour andWorking Conditions	PS 2 recognises that the pursuit of economic growth through employment creation and income generation should be accompanied by the protection of the fundamental rights of workers. PS2 aims to: • Promote fair treatment, non-discrimination and equal opportunity of workers; • Establish, maintain and improve the worker-management relationship; • Promote compliance with national employment and labour laws; Protect workers, including vulnerable categories of workers such as children, migrant workers, workers engaged by third parties and workers in the client's supply chain; and • Promote safe and healthy working conditions and the health ofworkers; and avoid the use of forced labour.	The need to protect the rights of workers involved in the DAI Project is triggered by PS2. This ESIA addresses the impacts related to the employment of children; identifies mitigation measures that will be implemented by DAI to safeguard the rights of its workers, and ensure safe and healthy working conditions.

IFC PS	Objectives	How this ESIA addresses it
Performance Standard 3: Resource Efficiency and Pollution Prevention	PS 3 recognises that increased economic activity and urbanisation often generate increased levels of pollution to air, water, and land, and consume finite resources in a manner that may threaten peopleand the environment at the local, regional, and global levels. Thus, PS3 aims to: • Avoid or minimise pollution from project activities; • Promote more sustainable use of resources (including energy andwater); and • Reduce project-related Greenhouse Gas (GHG) emissions.	This ESIA includes an assessment of the risk of pollution and includes mitigation measures that will be aimed at minimizing pollution. Also, assessment of the risk of expansion in cashew farms resulting in climate change-related issues. The requirements of PS 3 on pollution management are addressed in the air quality management, waste management and water quality management frameworks. Complying with the mitigation measures in the Environmental and Social Management Plan (ESMP) will ensure that the impacts are avoided and/or reduced.
Performance Standard 4: Community Health, Safety, and Security	PS 4 recognises that project activities, equipment, and infrastructurecan increase community exposure to risks and impacts. PS4 aims to: • Anticipate and avoid adverse impacts on the health and safety ofaffected communities during the project life from both routine andnon-routine circumstances; and • Ensure that the safeguarding of personnel and property is carried out in accordance with relevant human rights principles and in a manner that avoids or minimises risks to the affected communities.	This ESIA includes an assessment of the potential health andsafety impacts that may occur due to the DAI Project. The ESMP includes health and safety training for contractors and workers. Noise, air quality and water studies, as well as the social impact assessment, community health and safety are taken into account during the assessment of impacts.

IFC PS	Objectives	How this ESIA addresses it
Performance Standard 5: Land Acquisition and Involuntary Resettlement	PS 5 recognises that project-related land acquisition and restrictions on land use can have adverse impacts on communities and personsthat use this land. PS5 thus aims to: • Avoid, and when avoidance is not possible, minimise displacementby exploring alternative project designs; • Avoid forced eviction; Anticipate and avoid, or where avoidance is not possible, minimize adverse social and economic impacts from land acquisition or restrictions on land use by (i) providing compensation for loss of assets at replacement cost and (ii) ensuring that resettlement activities are implemented with appropriate disclosure of information, consultation and the informed participation of those affected; and • Improve, or restore, the livelihoods and standards of living of displaced persons.	This ESIA includes a socio-economic impact assessment, where the impacts (negative and positive) of the proposed project on the communities around the project area have been assessed.
Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources	PS 6 recognises that protecting and conserving biodiversity, maintaining ecosystem services, and sustainably managing living natural resources are fundamental to sustainable development. PS6 aims to:	This ESIA includes a biodiversity assessment undertaken by a specialist, which describes the biodiversity in the affected area. The assessment identifies any biodiversity of importance such as IUCN

IFC PS	Objectives	How this ESIA addresses it
	• Protect and conserve biodiversity; • Maintain the benefits from ecosystem services; and • Promote the sustainable management of living natural resources through the adoption of practices that integrate conservation needs and development priorities.	Redlist species requiring special protection. The assessment includes the identification of the project's potential impacts on biodiversity and an assessment of the significance of the identified impacts. Mitigation measures are identified and included in the Biodiversity Management Plan that is included in the project's ESMP.
Performance Standard 7: Indigenous Peoples	PS 7 recognises Indigenous Peoples, as social groups with identities that are distinct from mainstream groups in national segments of the population. PS7 thus aims to: • Ensure that the development process fosters full respect for human rights, dignity, aspirations, culture and natural resource-based livelihoods of Indigenous Peoples; • Anticipate and avoid adverse impacts of projects on communities of Indigenous Peoples, or when avoidance is not possible, to minimise and/or compensate for such impacts; • Promote sustainable development benefits and opportunities for Indigenous Peoples in a culturally appropriate manner; • Establish and maintain an ongoing relationship based	No recognized Indigenous Peoples are impacted in this project, hence PS7 is not triggered.

IFC PS	Objectives	How this ESIA addresses it
	on informed consultation and participation with the Indigenous Peoples affected by a project throughout the project's life cycle; • Ensure the Free, Prior and Informed Consent of the affected communities of Indigenous Peoples when the circumstances described in this Performance Standard are present; and • Respect and preserve the culture, knowledge and practices of Indigenous Peoples.	
Performance Standard 8: Cultural Heritage	PS 8 recognises the importance of cultural heritage for current andfuture generations. As such, PS8 aims to: • Protect cultural heritage from the adverse impacts of projectactivities and support its preservation; and • Promote the equitable sharing of benefits from the use of cultural heritage.	No recognized Cultural Heritage are impacted in this project, hence PS8 is not triggered.

2.4.3 International Finance Corporation/World Bank Group (IFC/WB) EHS Guidelines

The World Bank Group / IFC, Environmental, Health and Safety (EHS) General Guidelines of April 2007 superseded the World Bank Handbook issued in 1998.

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). When one or more members of the World Bank Group are involved in a project, these EHS Guidelines are applied as required by their respective policies and standards.

The EHS Guidelines contain the performance levels and measures that are generally considered to be achievable in new facilities by existing technology at reasonable costs. Application of the EHS Guidelines to existing facilities may involve the establishment of site-specific targets, based on environmental assessments and/or environmental audits as appropriate, with an appropriate timetable for achieving them.

The updated EHS Guidelines serve as a technical reference source to support the implementation of the IFC Performance Standards. When Guinean Environmental regulations differ from the levels and measures presented in the EHS Guidelines, the Project will be expected to achieve whichever is more stringent.

2.4.3.1 Air emissions

The IFC (International Finance Corporation) General EHS Guidelines (2007) set guidelines for ambient air quality. Table 2.7 presents international air quality standards, for the following pollutants: NO_2, CO, PM_{10}, $PM_{2.5}$ and SO_2. The international standards set by the IFC Environmental, Health, and Safety Guidelines for Air Emissions and Ambient Air Quality published on 2007 refers to the WHO Air Quality Guidelines.

The IFC Guidelines are intended to confer a maximum degree of protection of human health. However, these also include a degree of pragmatism in recognising that achievement of the guidelines may not be achievable in all circumstances; in these cases, for some pollutants interim targets are identified. These are designed to confer a degree of protection of human health, with the aim that regulators should work towards achievement of the Guideline.

Table 2.7 Air quality standards: Guinean and IFC General EHS directives

Pollutants	Guinean Limits	IFC limits (WHO AQ Guidelines)	Statistical definitions
SO_2	50 µg/m^3	-	Yearly average
		125 µg/m^3 (Interim target 1)	
	125 µg/m^3	50 µg/m^3 (Interim target 2)	Daily average
		20 µg/m^3 (Guideline)	
		µg/m^3	
	-	500 µg/m^3	10 min average
NO_2	40 µg/m^3	40 µg/m^3	Yearly average
		200 µg/m^3	
	200 µg/m^3		Hourly average
CO	30 µg/m^3	-	Daily average
PM_{10}	80 µg/m^3	70 µg/m^3 (Interim target 1)	Yearly average
		50 µg/m^3 (Interim target 2)	
		30 µg/m^3 (Interim target 3)	
		20 µg/m^3 (Guideline)	
	260 µg/m^3 (1)	150 µg/m^3 (Interim target 1)	Daily average
		100 µg/m^3 (Interim target 2)	
		75 µg/m^3 (Interim target 3)	
		50 µg/m^3 (Guideline)	
$PM_{2.5}$	65 µg/m^3	35 µg/m^3 (Interim target 1)	Yearly average
		25 µg/m^3 (Interim target 2)	
		15 µg/m^3 (Interim target 3)	
		10 µg/m^3 (Guideline)	
	-	75 µg/m^3 (Interim target 1)	Daily average
		50 µg/m^3 (Interim target 2)	
		37.5 µg/m^3 (Interim target 3) 25 µg/m^3 (Guideline)	

2.4.3.2 Noise emissions

The IFC EHS General Guidelines (2007) implement the "Guidelines for Community Noise" established by the World Health Organization (WHO) in 1999.

Table 2.8 details the IFC EHS guidelines for community ambient noise levels, which prescribe an absolute level of 55 dB(A) during the daytime and 45 dB(A) during nighttime value in residential

areas. These values make reference to noise from facilities and stationary noise sources, and are commonly applied as design standards for industrial facilities; IFC has indicated that these limits are not directly applicable to transport or mobile noise sources.

In environments where the ambient noise levels already exceed a level of 55 dB(A) at daytime and/or 45 dB(A) at night time, the IFC includes a guideline stating that noise emissions should not cause the ambient noise level in a residential area to rise by 3 dB(A) or more, determined during the noisiest hour of a 24 hour period.

Referring to noise measurements, IFC gives several specifications on noise monitoring programs design, as follows:

- measurements are to be taken at noise receptors located outside the Project property boundary;
- typical monitoring periods should be sufficient for statistical analysis and cover an appropriate time period according to noise variation (24h, hourly or more frequently); and
- monitors should be located approximately 1.5 m above ground and not close to the reflecting surface.

Table 2.8 Ambient noise levels: proposed Guinean standards and IFC guidelines

<table>
<tr><th rowspan="3">Period</th><th colspan="5">Maximum Ambient Noise Level 1-hour Leq [dB(A)]</th></tr>
<tr><th colspan="3">Guinean standards</th><th colspan="2">IFC Guidelines</th></tr>
<tr><th>Class 1 Residential area</th><th>Class 2 Commercial area</th><th>Class 3 Industrial area</th><th>Residential Institutional, Educational</th><th>Industrial, Commercial</th></tr>
<tr><td>6:00 – 13:00</td><td>50</td><td>55</td><td rowspan="4">70</td><td rowspan="3">55</td><td rowspan="4">70</td></tr>
<tr><td>13:00 – 15:00</td><td>45</td><td>50</td></tr>
<tr><td>15:00 – 22:00</td><td>50</td><td>55</td></tr>
<tr><td>22:00 - 6:00</td><td>45</td><td>50</td><td>45</td></tr>
</table>

2.4.3.3 Water

The IFC recommends compliance with national or local standards for sanitary wastewater discharges or, in their absence, the indicative guideline values applicable to sanitary wastewater discharges.

Table 2.9 compares the effluent quality parameters before discharge in the environment of Guinean legislation and the IFC Guidelines. The IFC Guidelines are generally more stringent except for Total

Suspended Solids (TSS) and Chemical Oxygen Demand (COD) depending on the flow rate of the discharge.

Table 2.9 Effluent quality parameters before discharge in the environment

Parameters	Guinean limits for wastewater discharge	IFC limits for treated sanitary water discharge
pH	5.5-9	6-9
Temperature	<30°C	<30°C
COD	<200 mg/L if the daily flow rate is ≤30 L/day <100 mg/L if the daily flow rate is >30 L/day	125 mg/L
TSS	<15 mg/L (specific limit for the mining industry)	50 mg/L
Biochemical Oxygen Demand $(BOD)_5$	<200 mg/L if the daily flow rate is ≤100 kg/day <100 mg/L if the daily flow rate is >100 kg/day	30 mg/L
Total nitrogen	<30 mg/L as monthly average concentration if the daily flow rate is ≥50g/day A different value can be fixed by the operating permit	10 mg/L
Total Phosphorus	<10 mg/L as monthly average concentration if the daily flow rate is ≥15kg/day A different value can be fixed by the operating permit	2 mg/L
Total hydrocarbon	15 mg/L if the daily flow rate is ≥150g/day	Total hydrocarbon

2.4.4 IFC Good Practice Handbook and Notes

The provisions of the IFC Good Practice Handbooks and Notes applicable to the DAI Project were taken cognisance of during the ESIA in the compilation of the ESMP.

2.4.4.1 IFC Good Practice Note Addressing Grievances from Project-Affected Communities

Companies across sectors and through all stages of project development can benefit from understanding community concerns and complaints and addressing them. This Good Practice Note provides guidance on basic principles and process steps that organisations should take into account when creating and implementing grievance mechanisms. Together, these principles and steps constitute a baseline set of considerations and good strategies for designing and implementing procedures appropriate to the project scale and impact.

2.4.4.2 IFC Stakeholder Engagement: A Good Practice Handbook for Companies Doing Business in Emerging Markets

This handbook endeavours to provide a comprehensive overview of good practice in stakeholder engagement, with a dedicated focus on stakeholder groups that are "external" to the core operation of the business, such as affected communities, local government authorities, non-governmental and other civil society organisations, local institutions and other interested or affected parties.

2.4.4.3 IFC Workers' Accommodation: Process and Standards

This guidance note, developed jointly by IFC and the European Bank for Reconstruction and Development (EBRD), looks at the provision of housing or accommodation for workers by employers and the issues that arise from the planning, construction and management of such facilities. This publication aims to provide practical guidance to IFC and EBRD specialists, consultants and clients on appropriate policies and standards relating to workers' accommodation.

2.4.4.4 IFC Good Practice Handbook: Use of Security Forces: Assessing and Managing Risks and Impacts

This Good Practice Handbook on the Use of Security Forces: Assessing and Managing Risks and Impacts have been developed for IFC clients and other private sector companies and their consultants. The handbook provides practical, project-level guidance for companies to better understand and implement the requirements outlined in Performance Standard 4. Chapters focus on risk assessment, managing private security, managing the relationship with public security, preparing a security management plan, and assessing allegations or incidents related to security personnel.

2.4.4.5 IFC Good Practice Note: Managing Risks Associated with Modern Slavery

This Good Practice Note (GPN) on Managing Risks Associated with Modern Slavery supports the private sector in the fight against modern slavery. The GPN does not set new standards but aims to provide practical tools to support environmental and social due diligence, as well as monitoring processes that many investors and companies already have in place. It also aims to provide an understanding of why action is necessary, how to manage and address issues, and the need for cooperation with others. The GPN is of relevance and practical use for a range of company functions,

including management, human resources, sustainability and procurement.

2.4.4.6 IFC Good Practice Note: Addressing Gender-Based Violence and Harassment (GBVH) Emerging Good Practice for the Private Sector

This Note outlines emerging practices in addressing GBVH in operations and investments. These practices are drawn from recent experience in the private sector, as well as a larger body of work from the non-profit sector. The guidance provides an opportunity to engage with stakeholders to refine practices as those in the private sector collectively gain implementation experience. In addition to this note, sector-specific briefs provide targeted guidance on addressing GBVH risks in key sectors, including transport, construction and manufacturing.

2.4.4.7 Good Practice Note: Managing Contractors' Environmental and Social Performance

This GPN is aimed at helping clients implement sound, consistent, and effective approaches, in compliance with IFC requirements, to manage the environmental and social (E&S) performance of their contractors, subcontractors, and other third parties working for the project. This GPN provides practical guidance to clients and contractors on the process of prequalification, solicitation, evaluation, contracting, and procurement to ensure adequate E&S management during construction, operation, and demobilisation activities. Finally, it provides recommendations on how to manage project performance during the different phases of the services being provided by contractors (i.e., from mobilisation to construction, operations, and maintenance) and how to monitor and report on contractor performance effectively.

2.4.5 DAI Health, Safety and Environmental Policy

Diaouné Agro-Industrie is a subsidiary of the company Diaouné et frères SARL, with a vision to become a national and international reference in the field of cashew nut processing. DAI is committed to the general well-being of its employees and ensures each employee has the right to derive personal satisfaction from his/her job and the prevention of occupational injury or illness.

DAI will initiate and maintain a complete safety program, in compliance with all applicable regulations, including accident prevention and safety training for all employees. All team leads are responsible for the safety and health of co-workers around them. By accepting mutual responsibility to operate safely, a commitment will exist throughout the DAI organization, which will contribute to the well-being of personnel.

DAI is committed to conducting its business in compliance with environmental laws, regulations and permits, incorporating environmental responsibility into all business operations through the implementation of appropriate environmental protection measures; managing operations in an environmentally-sensitive manner, with an emphasis on conservation through improved energy

efficiency, reduced consumption of natural resources, recycling, and the use of renewable resources; and maintaining an effective communication system for environmental matters through training and improved awareness.

3 PROJECT DESCRIPTION

3.1 Introduction

The Project Description sets out the scope of the Project features and activities, with particular reference to the aspects which can impact the environment and social settings. The proposed DAI cashew processing will be constructed in Boké, which is considered the largest cashew production basin in Guinea. Interestingly, the proposed plant in Boké will serve as DAI's second cashew processing plant in Guinea, after successfully, establishing and currently operating one in the Kankan region. The facility will be constructed to transform raw cashew nuts into cashew kernels for local and international consumers with an annual production capacity of 10,000 tons.

Details of the Project facilities' design characteristics, as well as planned and unplanned Project activities, are provided in the subsequent sections of this chapter.

3.2 Project Location

The proposed Cashew nut processing project facility will be located in Boke prefecture, which is one of the prefectures in the Boke region of Guinea. The project will be situated in Kataba village on a land area of 30,0000sq m along the major Boke-Kalaboui Road. The site is situated approximately 14.3km due west along the main road, outskirts of the main Boke town. Accessibility by road through the project site to Boke town from Conakry is through the Boke-Kalaboui Road which serves as the only access to the part of Guinea. A map showing the project site with the entire Boke region is shown in Figure 3.2. Furthermore, the project site boundary coordinates are as indicated below:

- SW corner: 10^{O} 50′ 11.1″N, 14^{O} 21′ 23.2″W
- SE corner: 10^{O} 50′ 11.8″N, 14^{O} 21′ 25.2″W
- NE corner: 10^{O} 50′ 4.3″N, 14^{O} 21′ 28.2″W
- NW corner: 10^{O} 50′ 3.9″N, 14^{O} 21′ 24.4″W

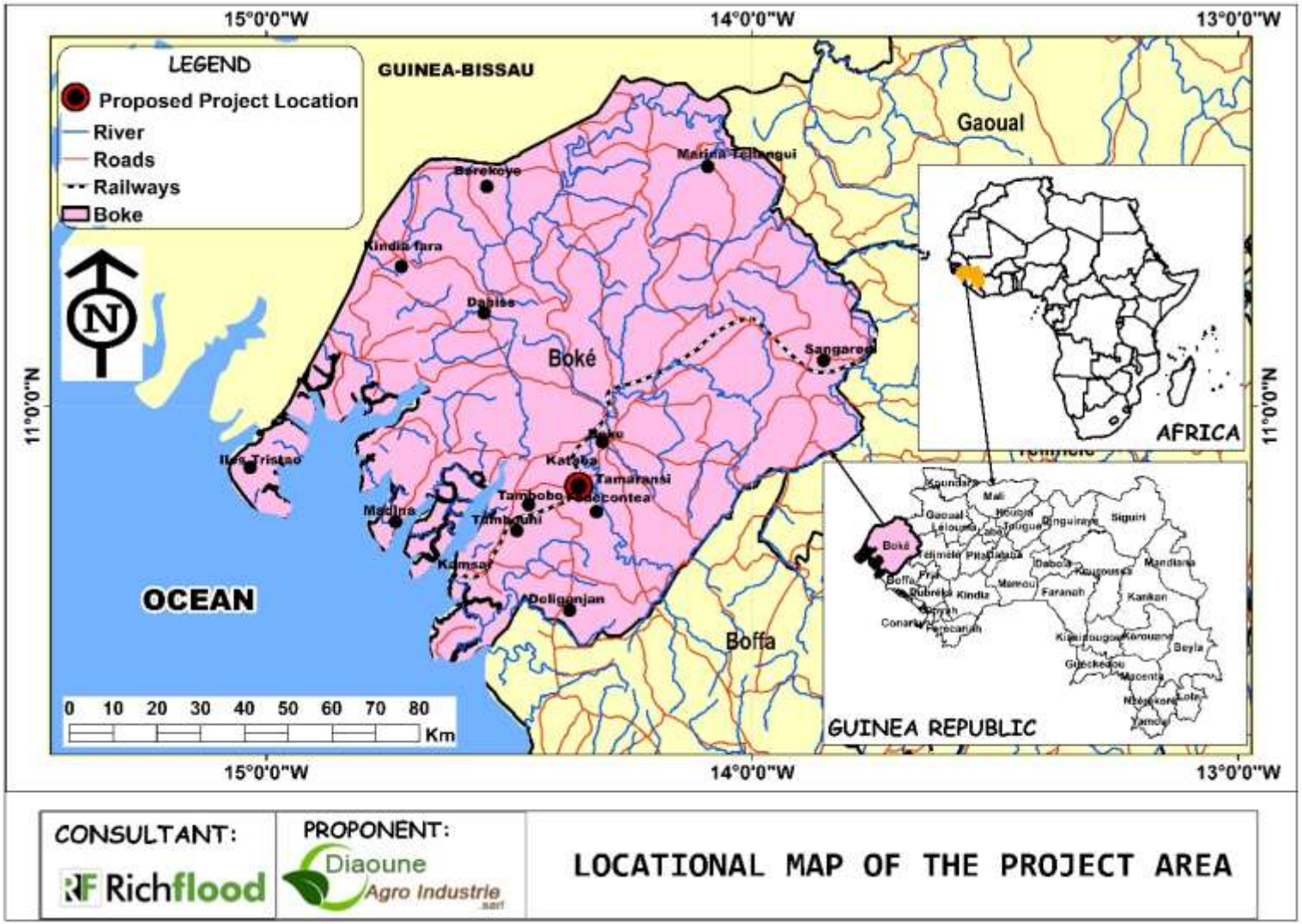


Figure 3.1: Location of the Proposed Project

Source: Richflood, 2022

Figure 3.2a: 3D Virtual Plan of the proposed process factory
Source: DAI, 2022

Figure 3.2b: 3D Virtual Plan of the proposed process factory

Source: DAI, 2022

3.3 Pre-construction Phase

This stage involves carrying out various studies to ascertain the economic, financial and environmental viability of the proposed Cashew processing project. Also, included in this stage are designing, feasibility studies, socio-economic surveys and community engagement etc. for the proposed project. More so, the construction of residential camps and offices for the contraction workers and provision of associated facilities.

3.4 Construction Phase

The Project facility with key features and sections is presented in Figure 3.3. The Project site is located on a fallow vegetation area and part of which had a gallery forest around the nearby stream on the west section of the site. The construction of the Project is not expected to lead to land taken beyond the proposed land plot allocated to the Project. At the time of the site visits undertaken in developing this ESIA (October 2022), the Project site has been cleared for setting up the various units of the plant with fencing structures. The description of the key sections of the cashew processing plant which is largely based on the knowledge of similar plants in Kankan includes the following:

- Administrative and service block
- Processing factory
- Processing and storage Warehouse
- Sorting and Calibration warehouse
- Security Gate and Weighing bridge area
- Car/ trailer park

Figure 3.3: Layout Plan of the cashew nut processing plant showing the different sections of the facility

Source: DAI, 2022

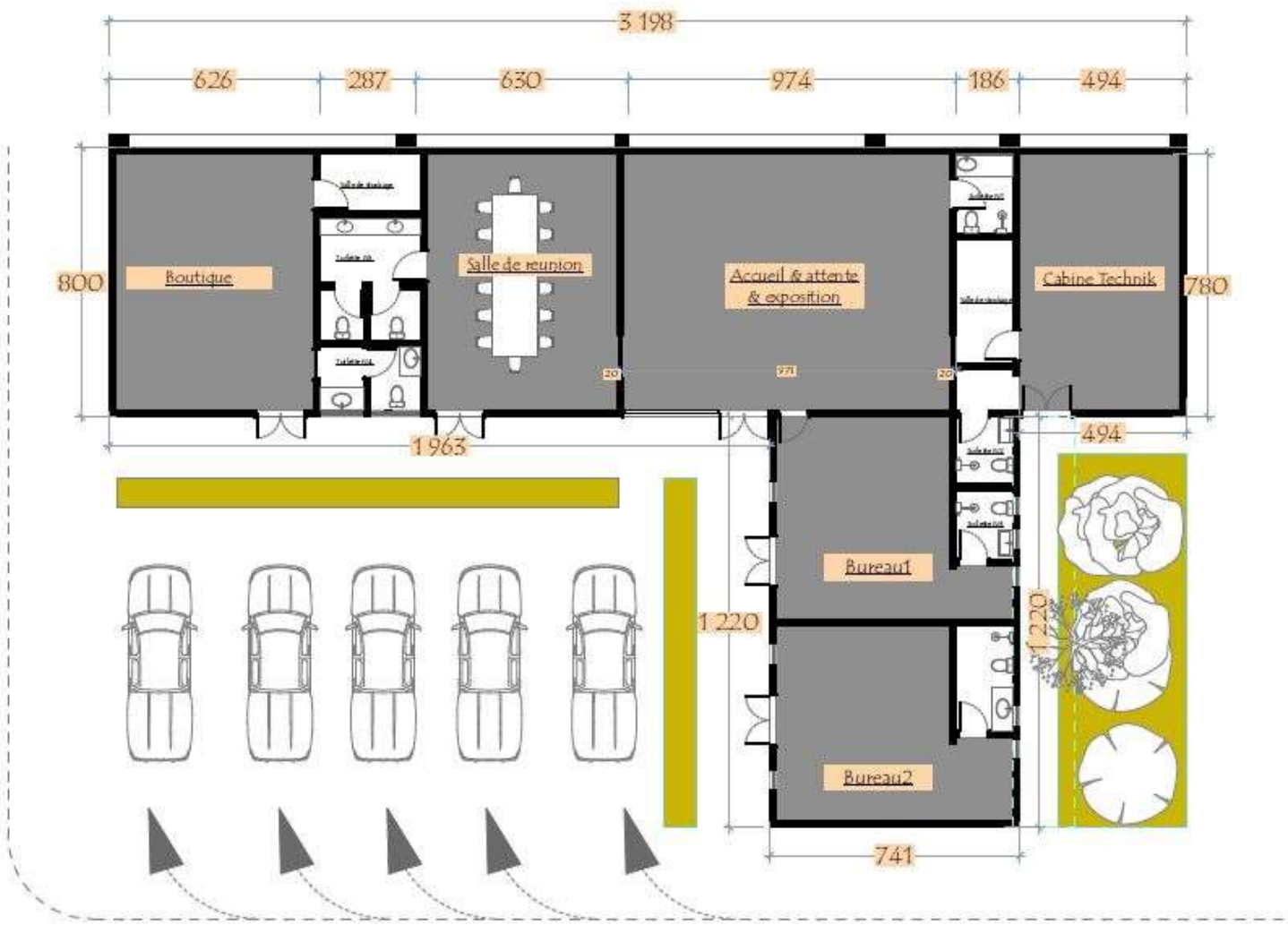


Figure 3.4: Layout Plan of the cashew nut processing plant showing the different sections of the facility
Source: DAI, 2022

The construction phase will involve works such as project site fencing, surface run-off channelization, drilling borehole water source, excavation and foundation work as well as factory and warehouse structure erection and installation. Construction-related nuisances such as noise and dust will be very limited given the temporary nature of the works.

The construction works for the cashew nut plant and the various activities will include:

- Vegetation clearance, surface stripping and topsoil stockpiling;
- Excavation works for structural foundation;
- Channelling and installation of site drainage;
- Establishment of hard standing for laydown areas, roads, paths; and
- Laying of concrete;
- Vegetation landscaping

3.4.1 Project Construction Contractor

Most of the raw materials (steel, cement) and other materials will be brought to the site by trucks. DAI has retained *Societe de Gestion Immobilière et de Construction* (SOGICO) for the construction of the proposed plant in Boke. SOGICO is a Guinea-based company with 15 years of experience in construction and civil works involving the similar project. Earlier, SOGICO was responsible for the construction of the DAI currently operating cashew plant in Kankan.

3.5 Operational Phase

Activities during the operational phase, the project will mainly focus on the following points:

- Sourcing and supply of raw cashew nuts to the factory;
- Processing of raw cashew nut into kernels;
- Distribution and export of finished raw cashew kernel; and

3.5.1 Raw material sourcing and Equipment Requirements

Raw Materials and Source

The Raw Cashew Nuts (RCN) for the cashew processing factory will be sourced from smallholder farmers and suppliers in the Boke region. The sourced cashew nuts will be bagged based on grades after harvest and sun drying, and then delivered to the factory using

trucks. DAI plans to further supplement the supplies from the Boke region, through supplies of raw cashew nuts from its DEF 480 ha farms.

The daily input raw material requirement (raw cashew nut) for the cashew processing factory will be between 32 to 35 tons/day for the 8-hours operation of the factory.

Based on the weather conditions in Boke region which influences the maturity and harvesting of cashew nut in the region, the seasonal activities for cashew nut processing are planned to run from February to May each year.

Machinery and Equipment

DAI plans to install and operate a modern automated cashew nut processing factory. The processing equipment for the cashew processing factory will be sourced majorly from Mekong Technology in Vietnam as well as other peer companies offering similar cashew processing equipment. Mekong Tech Group specializes in the design and manufacture of all kinds of raw cashew nut Sizing Machines.

Table 3.1: List of plant and machinery required

Equipment	Number	Capacity
Raw Cashew cleaning	1	6000 kg/hour
Raw Cashew cleaning	3	2000 kg/hour
Cashew steaming machine	2	800 kg/ batch
Shelling machine with scooping system	5	800kg/hour
Boiler	2	2000kg/hour
Cashew kernel drying machine	4	3ton/batch (12 hour/batch)
Cashew peeling machine	4	300kg/hour
Cashew kernel grading machine	2	400kg/hour
Electronic scale	40	60kg-20unts;300kg-20units
Semi-Automatic Carton Sealing Machine	4	Conveyor speed: 16m/min

Source: DAI, 2022

3.5.2 Processing of raw cashew nuts

Processing of cashew involves the transformation of raw cashew nuts into high-quality cashew kernels. The transformation process consists of 7 key steps, which are labour-intensive and involve a critical choice of technology and methods at each step for efficient

and competitive processing. The key steps involved in the processing of RCN into kernels are listed below:

A. Cleaning & Sorting
B. Steaming
C. Shelling and Separating
D. Drying and Fumigation
E. Peeling
F. Grading
G. Packaging and Storage

The details in each step of the processing are provided below:

A. Cleaning & Sorting

Grading is the very first step in the processing of raw cashew nuts into final kernel products. This process entails separating the raw cashew nuts from impurities such as; dust, stones, wood particles etc. Cashew nuts brought into the factory in bags are first spread on the ground and manually sorted to take out waste. A high number of causal workers, mostly women are involved in this process. After manual sorting, the nuts are transferred into a sizing calibration machine for automatic sorting of waste and classification of the cashew nuts into different grades based on the quality (size).

The process involves feeding the raw cashew nut into the sorting drum of the machine through the hopper and bucket conveyor where they are sorted based on size and discharged into bags attached to different outlets. The classified cashew nuts are packed in 80kg bags and stored in the warehouse for subsequent transfer to the factory. The cashew nuts as classified into six grades which includes; C_{18}, C_{20}, C_{22}, C_{24} and C_{26} and further explained below:

i. Grade C_{26} which gives the almond quality of ww210;
ii. Grade C_{24} gives a large and small size quality of ww240;
iii. Grade C_{22} gives the almond quality of ww320;
iv. Grade C_{20} gives ww450;
v. Grade C_{18} gives a quality of ww500.

This calibration is so crucial because it will give a broad idea not only of the grades that will be obtained later but also of the quantity to be obtained in the kernel since these nuts are quantified from there.

Plate 3.1: Raw cashew nut cleaning and calibration machine
Source: DAI, 2022

B. Steaming

This is the second phase where the different graded nuts are simmered in a boiler for a period ranging from 24 to 35 minutes depending on the different grades. The cashew steaming

process is amongst the most critical processes in the cashew process and decides the quality of the finished cashew kernel. The steaming process prepares the raw cashew nut for the shelling machine, by pressure cooking the cashew nut using saturated steam from the boiler. It results in high performance and minimized broken and uncut in cashew shelling and separating system. It further helps to separate the kernels and shells and ease the process of shelling in the shelling machine. The steaming of the cashew nut in the boiler takes different timing for the different grades of cashew nuts. The boiler is designed especially for cashew processing factories, with high automatic and saving fuel. Furthermore, the boiler is compatible with cashew nut shells which are utilised by burning the shell to produce the required steam for the cashew nut steaming process. The boiler is equipped with a dust and smoke processing system to ensure a friendly environment.

Plate 3.2: Cashew nuts steaming machine
Source: DAI, 2022

C. Shelling and Separating

The process takes place in the shelling machine and involves splitting and separating the steamed raw cashew nuts into cashew shells and cashew kernels. The kernel after shelling

will have a moisture content of more than 10%. The automatic cashew cutting line is a mechanical system consisting of many automatic cashew shelling machines connected to an automatic cashew separating system which saves operating labour. This mechanized cutting of the raw nuts, allows the kernel to get rid of its shell. The shelling machines will have the capacity to shell eighteen thousand kilograms (18,000kg) for 8 hours of operation.

Plate 3.3: Cashew nut shelling machine
Source: DAI, 2022

D. Drying and Fumigation

This stage involves the drying of the unpeeled cashew kernel to a moisture content of about 3.5-4.5 %, preparing it for the cashew peeling machine. After the shelling of the kernel obtained from the shelling machines, the products are placed in the oven using a perforated tray, and drying them at a temperature of 60-80°C for eighteen hours (18hrs). Two (2) large ovens will be utilised for the process with each having a capacity of four carts. Each cart has a capacity of 120 to 128 pallets, and each pallet has a surface area of 5kg. Therefore, the two ovens have a content ranging from 4800 to 5120kg /18hour.

After drying, the coated kernels are transferred to another closed chamber for fumigation where it is placed for 20mins. The fumigation helps the kernel to increase in size and remove the skin. After this period, the same peeled kernels are returned once again to the oven to dry again for twenty-five minutes (25 minutes) to facilitate the removal of the skins. After this combination of oven work and fumigation, the dried peeled almond kernels are transferred to the next stage of the processing.

Plate 3.4: Cashew nut drying oven (left) and fumigation machine (right)
Source: *DAI, 2022*

E. Peeling

The nuts are transferred from the fumigation chamber to the peeling machine. Peeling the cashew kernels means getting rid of their hush (skin) by removing the silk from the cashew kernel. The peeling stage also serves as the first stage of the grading where whole kernels of all grades as well as broken kernels of all qualities including colour are sorted. This stage basically will involve the use of both manual and mechanised peeling methods. The mechanised peeling process using the peeling machine cannot give 100% peeled kernel, which leads to further manually peeling the kernel. The manual peeling process involves the removal of the testa from the kernel with the help of a sharp knife. The peeled kernels are transferred for grading, which is the next step.

Plate 3.5: Cashew nut peeling Machine
Source: DAI, 2022

F. Grading

Grading uses the combination of a cashew colour sorter machine and a manual approach by workers to classify cashew kernel sizes according to the size required by the export market. This process involves both mechanised and manual methods with a classification of the kernels into whole or broken kernels. At this stage, each of these grades (26, 24, 22, and 20) which are unpeeled, peeled as well as rotten kernels are classified and sorted separately. The Cashew Export and Promotion Council (CEPC) specifications are adopted for the grading of cashew kernels.

Mechanized Grading

The peeled and unpeeled kernels from the nomenclature room and the manual peeling room respectively, are fed to the grading machine for grading after the peeling according to the different grades. A typical grading machine consists of five (5) ports. One (1) port for the 24 and 26 grades which will give ww240 at 98% and ww210 at 2%, two (2) ports for the 22 grades which will give www320, one (1) port for the 20 grades which will give ww450 and ww320 minus, and the last port for the breaks that occurred during processing. The primary objective of this mechanized grading is to make manual grading not only faster but also easier, especially in the case of ww240 and ww320.

Plate 3.6: Cashew kernel grading machine
***Source**: DAI, 2022*

Manual Grading

This involves the manual separation of the kernel by the workers, who are mostly women. Proper illumination is required at this unit to ensure the classification process is thoroughly done. As a basic standard requirement, the grading room must be clean from the base to the top, especially the tables, including the baskets and the lockers. The room is also fully air-conditioned to avoid any contact with the sweat on the kernels

Plate 3.7: Manual Grading Process
Source: DAI, 2022

The classifications of the different grades of kernel adopted by DAI are as shown below:

Figure 3.5: Cashew kernel grading

Source: *DAI SARL Business Plan Report, 2022*

KEY: WW: White Whole; WB: White Butts; SSP: Scorched Small Pieces; SP: Scorched Pieces; LWP: Large White Pieces; WSP: White Small Pieces; WS: White Splits

Fumigation (Disinfection)

This is the process of disinfecting graded and weighed kernels possibly contaminated during touching in the grading process. Disinfectants (organic fumigation tablets) are placed at the top of the bag containing the kernel for 3 days (72 hours). There are typically four (4) fully insulated chambers for fumigation operations of the finished products intended for local sale and export. The fumigation process not only disinfects the grain against any possible bacterial pathogen but also acts as a repellent against pests to the grains.

G. Packaging and Storage

After grading and fumigation, the kernels are packaged and stored in cartons according to grades and labelled for identification. The kernels are then conditioned for packing by maintaining a moisture content of 3.5 % – 4 %, which is ideal for packaging. The maintenance of the ideal moisture content is achieved by either drying or humidification to reach the required moisture content. Low moisture levels result in breakages after packaging, whereas high levels of moisture induce blockage or clamping of kernels after packaging.

After glueing the cartons of the packed kernel, the labelled or coded cartons are sent directly to the warehouse for storage.

Plate 3.8: Packaging Machine
Source: DAI facility, Kankan

Plate 3.9: Packaged and sealed cashew kernel

Source: DAI, 2022

Plate 3.10: Storage Warehouse

Source: DAI Facility, Kankan

3.5.3 Distribution and Export

The finished products which are unflavored cashew nut kernels of different calibres will be vacuum-packed into 21-kilogram boxes and shipped to Asia mostly Vietnam and Turkey using 20-feet containers. The distribution circuit will be between the factory, the local market and the international market. The distribution or sale is made by sales contracts duly signed before delivery. Delivery is made within the period signed in the contract to retain the customer and be in compliance with the contractual prices as well as to cope with cash flow and inventory purchase problems.

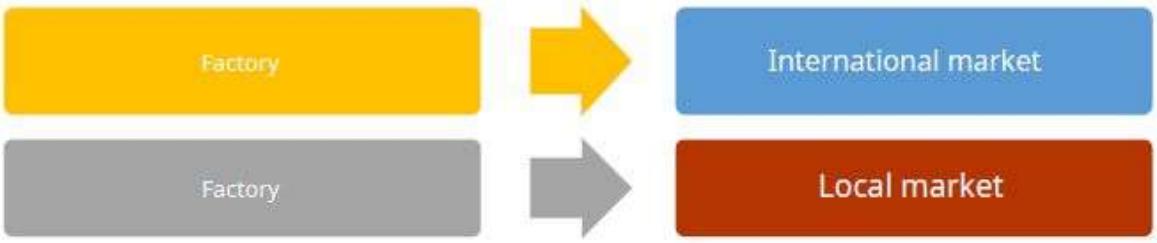


Figure 3.6: The Distribution chain for DAI SARL products
Source: DAI SARL Business Plan Report

3.6 Expected Waste Streams and Emissions

3.6.1 Solid waste generation and management

Solid waste from the proposed project will be mainly from the domestic waste generated both during the construction and operation phases of the project. The cashew nut shell (CNS) will be generated mainly from the operational phase of the cashew shelling process. Also, CNS exposure to weather conditions such as sun and rain results in leakage of Cashew Nut Shell Liquid (CNSL) into the soil. This could lead to pollution of surrounding freshwater streams. A summary of the waste to be generated with disposal & management options is detailed below.

Table 3.2: Proposed project solid waste and management options

Waste generated	Method of handling
Domestic solid waste	Segregated at source and disposed of by way of composting.
Boiler ash	Properly landfilled following necessary precautions to avoid secondary air emissions.
Cashew nutshell	40% of this is used as fuel energy for the boiler to generate heat for cashew steaming and the balance is transformed to

Waste generated	Method of handling
	compost for organic fertilizer or incinerated. Deposit shells at a waste disposal site with a containment barrier or within a pit to avoid run-off of CNSL.
Testa (cashew husk) from peeling kernel	Composted for reuse as fertilizer or incinerated
Rejected kernel	Given out and combined other dry edible material to produce animal feed.
Used oil from power-generating sets	Collected in barrels and sold to authorized recyclers.

3.6.2 Waste Water

Wastewater from the cashew processing could be in the form of industrial wastewater from the steaming (cooking) and shelling process and sanitary wastewater (sewage).

Domestic wastewater

Sanitary wastewater will be generated from sanitary facilities in the toilet, canteen etc. The wastewater will be channelled to the septic tank/ soak pit within the facility.

Industrial wastewater

Wastewater effluent from the cashew nut processing operation will be generated from the steaming (cooking) process of the cashew nut as a result of the heat energy from the boiler. The wastewater will include condensed boiler water mixed with CNSL. This will be managed by channelling and treatment in an Effluent Treatment Plant comprising an equalization tank, neutralization cum settling tank and sludge drying bed. The treated effluent will be discharged according to industry standards.

Table 3.3: Summary of wastewater and management options

Description	Treatment
Sanitary wastewater	Septic tank and soak pit
Steaming (cooking) condensate mixed with CNSL	Disposed and treated in ETP adopting Phyto-purification and discharged to the ground.
Cleaning and washing	Disposed and treated in ETP and discharged to the ground.

3.6.3 Air Pollution

The main sources of air pollution from the proposed project will include emissions from the power generating set and the boiler flue gas which will be the source of heat energy for the cashew steaming (cooking) process. The air pollutant from the boiler will mainly be in the form of negligible concentration of SO_2 particulate matter in the flue gas. There will not be processed gas emissions during the cashew nut processing activities as it will be done under a fully closed system.

The project will provide cyclone dust collectors and scrubbers as Air Pollution Control measures to control the emission of particulate matter in the flue gas arising from boilers and power generating sets. Also, adequate stack heights will be provided for the proper dispersion of flue gases into the atmosphere from the boiler resulting in minimum possible ground-level concentrations.

Table 3.4: Summary of Air pollution sources and control equipment

Source	Fuel requirement	Air Pollution Control equipment
Boiler	Cashew nutshell	Cyclone dust collectors and Scrubbers
Power generator set	Diesel	Scrubbers

3.6.4 Noise Pollution

Noise pollution from the proposed project will be mainly due to some fixed installations and operation of cashew processing equipment as well as machineries such as forklifts and mini bikes. The cashew steaming and shelling process and power-generating sets will be the major noise-generating units in the plant.

The generator will be provided with an acoustic enclosure to mitigate noise from the power-generating set. There is no need for the workers to be near this unit continuously. However, the workers in this area will always be provided with ear muffs.

The impact of noise during the operational phase is not expected to exceed the WHO and IFC permissible limits. All the equipment in the plant would be designed to have a total noise level not exceeding 85-90 dB (A) as per the requirement of OSHA (Occupational Safety and Health Administration) standards and IFC PS.

3.7 Auxiliary Facilities

3.7.1 Water Use Requirements

The water use requirement for the various operations of the proposed project is estimated at 100m^3/day. Water required for all aspects of the factory operation including domestic and sanitary use in the facility will be sourced from a dedicated borehole to be drilled in the project site.

3.7.2 Power Requirement

Power for the operation of the factory and the various sections in the facility will be supplied through a power generating set to be installed in the facility. Three (3) units of 500 KVA and two (2) units of 200 KVA generating sets are planned to be installed in the facility to provide the required power. This will be alternated at peak operation hours during the day and generation reduced at night for the essential units. The generators will be operated mainly on diesel and a 5000 litres fuel storage tank is planned to be installed, similar to that of the Kankan factory.

The project site and surrounding area which is the outskirt of Boke town is currently not linked to the national grid. At the time of the site visit for the ESIA studies, electric power poles without power cables were observed running along the major Boke – Kalaboui Road where the project site is situated. Feedback from residents indicated the poles are recently installed a few months before the site visit (October 2022) possibly to extend power from Boke town to communities in the project area. It is considered that the DAI project will be linked to the national as soon as the installation is completed and the generators serve only as backup during power failure from the national grid.

3.8 Workforce Requirements

Construction Phase

Up to approximately 100 workers are expected to be engaged as part of the construction phase to cover the civil, mechanical and electrical engineering tasks.

Operational Phase

The workforce required for the proposed project shall be largely residents around the project location. It is envisaged that the project will attract a few migrant workers as captured in the socioeconomic baseline assessment within the project area. The project is expected to engage

both permanent and casual workers (peak workforce) during the operational phase of the factory. The casual workers will largely comprise women who will be engaged in the various aspects of the project during the seasonal peak period of cashew processing. An estimated 500 individuals are expected to be engaged as a workforce for the project. A larger percentage of individuals to be engaged will be women constituting about 400 (80%) of the workforce, engaged mostly as casual workers during the project's peak period of cashew harvesting and processing. About 20% of the workforce which includes; Plant manager, process manager, Plant maintenance supervisor, Quality controller, Database manager and Sort workshop supervisor will be engaged permanently for the continuous operation of the factory. During the cashew off-peak period, the operation of the factory will rely mainly on its stocks during the cashew seasonal supplies.

3.9 Project Schedule/Implementation

The construction phase of the factory is expected to last for about 18 months starting in the first quarter of 2023. Commissioning of the cashew processing plant is expected to occur in the third quarter of 2024.

Although the operational lifespan of the project is estimated at 99 years based on information provided by DAI, however, the Project will depend on economic conditions largely bothering on the supply of raw cashew nuts as well as operation and maintenance requirements of the equipment.

3.10 Decommissioning and Restoration Phase

At the expiration of the useful life of the project which is estimated at 99 years, adequate arrangements will be made to remove all movable assets. When the life span of the project comes to an end, the facility would be decommissioned and put off use. A decommissioning process or plan would be activated. Decommissioning activities will include equipment site securitisation, equipment clean-up, dismantlement of equipment and structures, as well as clean-up of site surfaces in line with applicable regulatory requirements.

The following steps would be undertaken by DAI, in decommissioning the facility:

- Regulatory Compliance and Approval;
- Site Preparation and Clearing;

- Uninstallation of facility components;
- Materials disposal; and
- Site Restoration

DAI shall implement a restoration plan for the project area unless otherwise requested by the communities with the AoI. This would be done after a fully documented agreement has been reached. If this situation arises, the information would be included in the restoration and post-impact assessment reports.

Site recovery shall include taking steps to restore the project site to its original conditions by promoting the growth of lost natural vegetation to make the area accessible to local inhabitants. All installations and structures shall be completely removed and sold or moved to another factory. Almost all the equipment and machinery shall be re-used for other industrial purposes. All plant facilities and machinery that are not deemed to be of further use will be sold off as scrap or recycled at metal depots.

3.11 Project Alternatives

The Project has considered alternatives in terms of site location, design and technology options. An analysis of these alternatives has been undertaken for the proposed Project including consideration of a no-Project scenario.

3.11.1 No-Go Alternatives

The no-go alternative means the project will not be executed, thereby retaining the status quo of the site. This means the site will continue to remain in its natural state and no structure erected on the site. This scenario would result in both the positive socio-economic impacts and the negative environmental and social impacts of the cashew processing project not being realised.

In this scenario, the opportunities that abound in the cashew industry in Guinea would not be realised as the cashew industry in the country would remain at the level of exporting raw cashew nuts for processing to others parts of the world. This will limit opportunities for value addition in the cashew value chain in the country. Despite an attempt to develop national industries, the majority of the West African countries export 99% of their raw cashew nuts

production to India or Vietnam where value is added through processing and exported to other countries.

Not going ahead with the project means the wider benefits of the availability of cashew nuts and associated benefits to the national economy will not be realized and Guinea's economic development may therefore be hampered. This option could pose a major setback to the industrialization and economic growth of the nation. Processing of cashew nuts in Africa provides direct jobs for people living in rural communities. These jobs would ensure a stable income and better food security for farming households. Thus, the No Project Option is not considered to be a viable development option.

3.11.2 Project Site Alternatives

In deciding the execution of the proposed project, after considering project development options, alternatives to be considered for the project includes the selection of a location to match the prospects of the project.

Boke was selected for the project because it is one of the two major cashew production areas in Guinea. The feasibility study confirms that the selected site has suitable natural potential and that intended operations are profitable with a fast and secured return on investment.

Other factors that were considered in the selection of the project site Include:

- Proximity to Conakry, through which the cashew kernels are being exported to other countries
- Availability of abundant raw materials (cashew nuts)
- Favourable landscape and topography with potential,
- Available workforce and easiness to attract qualified workers,

3.11.3 Technology Alternatives

Technological choices made by DAI in the definition of the industrial process for the cashew nut processing plant configuration concerned the following topics:

- Environmental and health considerations
- Economic considerations

Commercial processing of cashew nuts at factories involves different stages of operations. The level of automation in the cashew industry is a function of the equipment and processing method to be adopted in the cashew industry. The cooking and shelling stage in the cashew process is dependent on the choice of automation in the factory, the cooking and shelling equipment and the involvement of human labour in the process. Steam-based techniques and roasting are the two main techniques deployed in the cooking of raw cashew nuts. The shelling options available in cashew processing include the manual hand-cum-pedal operated sheller, the foot-operated shell cutters and the mechanical shelling process using shelling machines.

From an environmental and health point of view, the steam-based technique of cooking cashew is a better technique due to less air pollution (particulate matter, SO_2 and odour) compared to using the roasted boiler technique. Although the roasted boiler technique is cheaper, the roasting process is hazardous to both the environment and workers. The cashew nut processing plant would therefore have to be fitted with expensive equipment to treat atmospheric emissions. Conversely, the cashew nut processing by steaming process, which is relatively less pollution-intensive and an alternative process to the roasting process was considered to reduce the environmental discharge load and health effects.

From an economic point of view, the automatic mechanised cashew processing technique in the shelling process was the most competitive solution, allowing more production output at the lowest cost possible. The manual hand-cum-pedal operated sheller and the foot-operated shell cutters require more manpower with lesser output. Their choosing to adopt the automatic shelling technique increases the production output with less manpower at this stage of cashew nut processing.

4 ENVIRONMENTAL AND SOCIAL BASELINE

4.1 Introduction

This chapter describes the environmental and social baseline of the project area. It includes a description of the physical and biological environment including habitats as well as the human environment (general review of socioeconomic conditions and the social context).

The information provided is based on the review of available desktop information as well as a field visit to the project site and surroundings in early October, 2022. A detailed field study of the Project site has been carried out, to have available reliable, up-to-date information as to the environmental and social components inherent to the Project. The baseline description further identifies the main environmental sensitivities that may be affected by the project.

The various aspects of the baseline information are based firstly on national, regional and local information. The analysis of environmental and social issues also considers the local context in the area in which the Project is located, utilizing a description of the baseline of the Project area. The project's area of influence (AOI) is identified and described for each aspect, based on the relevant parameters.

Three different field studies were performed for the Project by Richflood from the 2nd to 7th October, 2022. They resulted in a qualitative and quantitative analysis of the biophysical environment and ecosystems, as well as public consultations. Consultations were held with the main commune authorities to establish an overview of the socio-economic conditions and social dynamics (see Chapter 6 on Stakeholder Engagement). These interviews provided information on the following features of the area:

- The administrative and social set-up of the communes;
- The main economic activities;
- Social dynamics;
- The area's existing infrastructure;
- The health situation; and
- Land tenure

The field surveys provided us with geo-referenced data on infrastructure, land boundaries and road networks within the project area. Descriptions based on the various environmental and social factors that may be impacted by the project are provided in the subsections below.

4.2 The Study Area

The Project site is located in Kataba within the Boké commune, Boké region, Guinea. The site is located on the outskirt of Boké town, which is about 14.3km away, along Boke-Kalaboui Road. The project site comprises a secondary forest and tributaries of water bodies traversing the area.

In order to carry out a detailed assessment of the impacts on the surrounding environment, the study was undertaken at the micro-local level, i.e. within a 5km radius of the site. The decision for the buffer zone is based on project categorization, literature review of similar projects and qualitative investigations undertaken with local communities and field assessment. Thus, the environmental and social study area has been defined to include the receiving environment of surrounding environmental components and communities upon which the Project may have an impact.

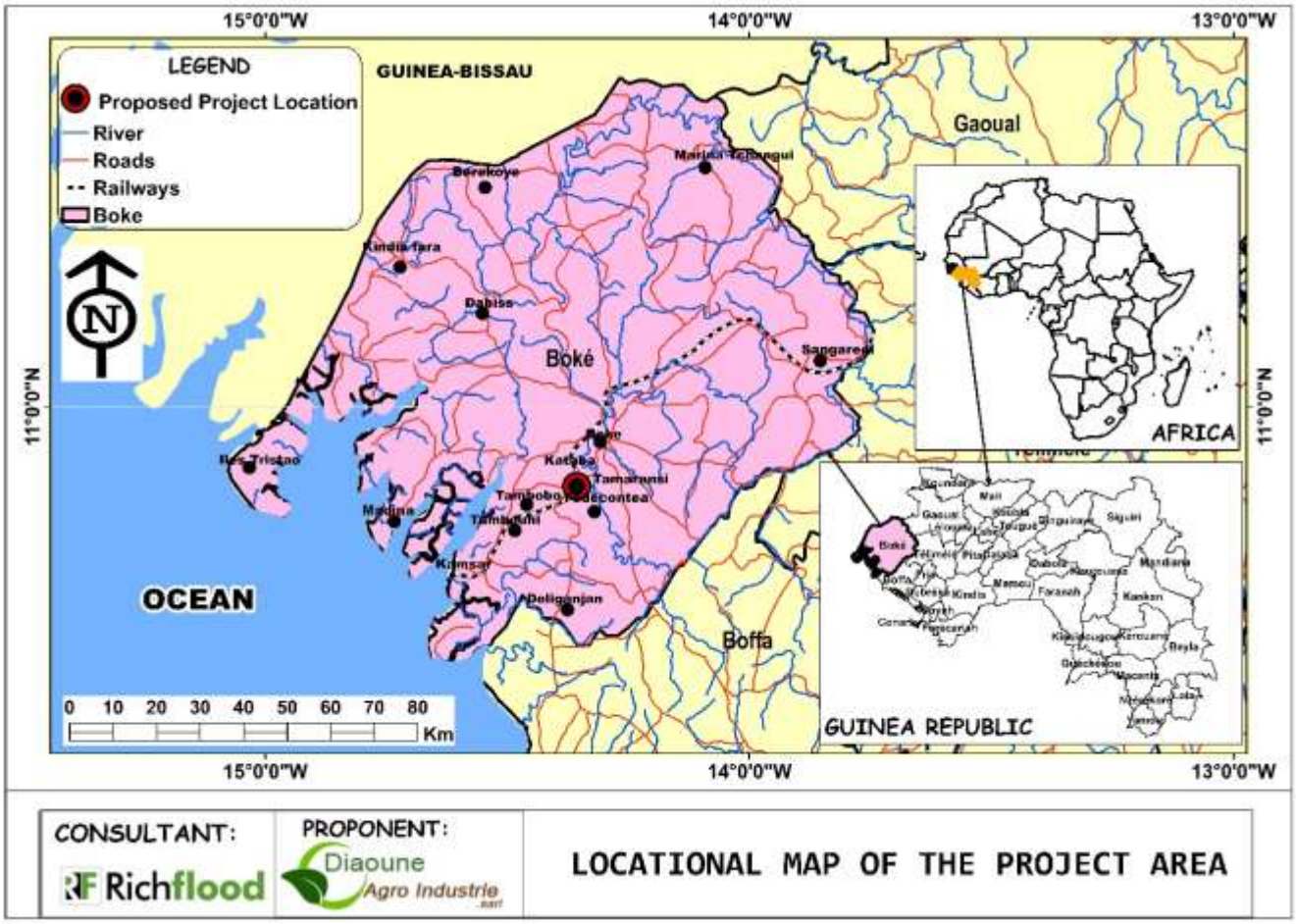


Figure 4.1: Location of the project site including surrounding villages surrounding within Boke Prefecture

Source: *Richflood, 2022*

4.3 Physical Environment

4.3.1 Climate and meteorology

Generally, the climate in Guinea is influenced by the Inter-Tropical Convergence Zone (ITCZ) north and south of the equator and is characterised by wet and dry conditions controlled by the north-south movements of the Inter-Tropical Convergence Zone around the equatorial line. Climatic conditions specific to the Boke region are largely dominated by two dominant air masses, namely the Tropical-Continental air mass (cT) which brings the dry and dusty northeasterly wind from the Sahara Region and the Tropical-Maritime (mT) air mass which originates from the Atlantic Ocean and brings warm and wet southwesterly winds. Both air masses are controlled by

the movements of the Inter-Tropical Convergence Zone. This interplay of two major air masses results in a distinct wet and dry season in the area.

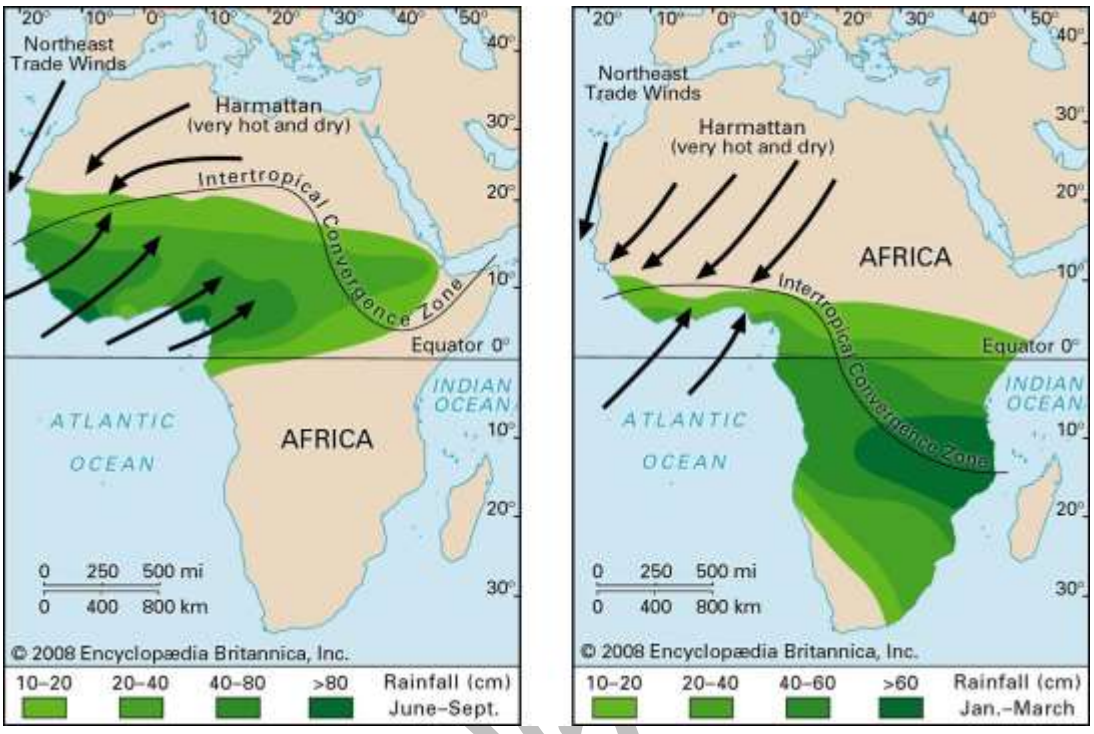


Figure 4.2: Schematic streamlines of near-surface flow in the Global Tropics
Source: *Encyclopaedia Britannica (2022)*

Rain and Temperature

Boke has a typically subequatorial tropical humid climate, which is characterized by a wet and dry season. With the arrival of the migratory Inter-Tropical Convergence Zone (ITCZ), the wet season starts from mid-May to mid-November, peaking in August, while the dry season starts from mid-November to mid-May, with its driest period in January. The dry season is typified by hot dry wind known as the harmattan, which blows from east and northeast, warm air and dust from the Sahara Desert.

The area experiences significant rainfall, with annual rainfall ranging from 2100 and 5000mm (mid-May to mid-November), and a monthly maximum of over 1000mm in August. The sub-Guinean tropical climate in Lower Guinea extends over the Boké region. During the coldest month of the year which is August, temperature ranges from 23 to 28°C. The average annual temperature

for Boké during the dry season ranges between 24 and 38ºC. The hottest month of the year is January with daytime temperatures exceeding 37ºC.

Boké experiences extreme seasonal variation in the humidity. Considering that the climate within the project area is essentially tropical, relative humidity tends to be high for much of the year. Based on historical climate data from 1961 to 1990, the average monthly Relative humidity for Boké as obtained from the World Meteorological Organisation indicates an average of 68% indicating relatively high conditions for most of the year.

4.3.2 Geology

Geology of Guinea Republic

The Republic of Guinea lies in the West Africa Craton, in the northwestern part of Africa. The lithology is formed by Precambrian crystalline and Palaeozoic Rocks, which spread along the Guinean-Liberian shield. The Fouta Djallon massif is made of Silurian shade. Ordovician sandstone experienced massive arrival in both dolerites' tertiary and a parent rock gigantic bauxitic with laterite deposits (Soumah, 2009). The northwest of the basin's coastal zone consists of an unconsolidated small outcrop of upper cretaceous to Tertiary sedimentary rocks. The Mesozoic contains some Kimberlite dykes and pipes located in the southern area that is diamond-bearing (Schlüter, 2006) as shown in Figure 4.3.

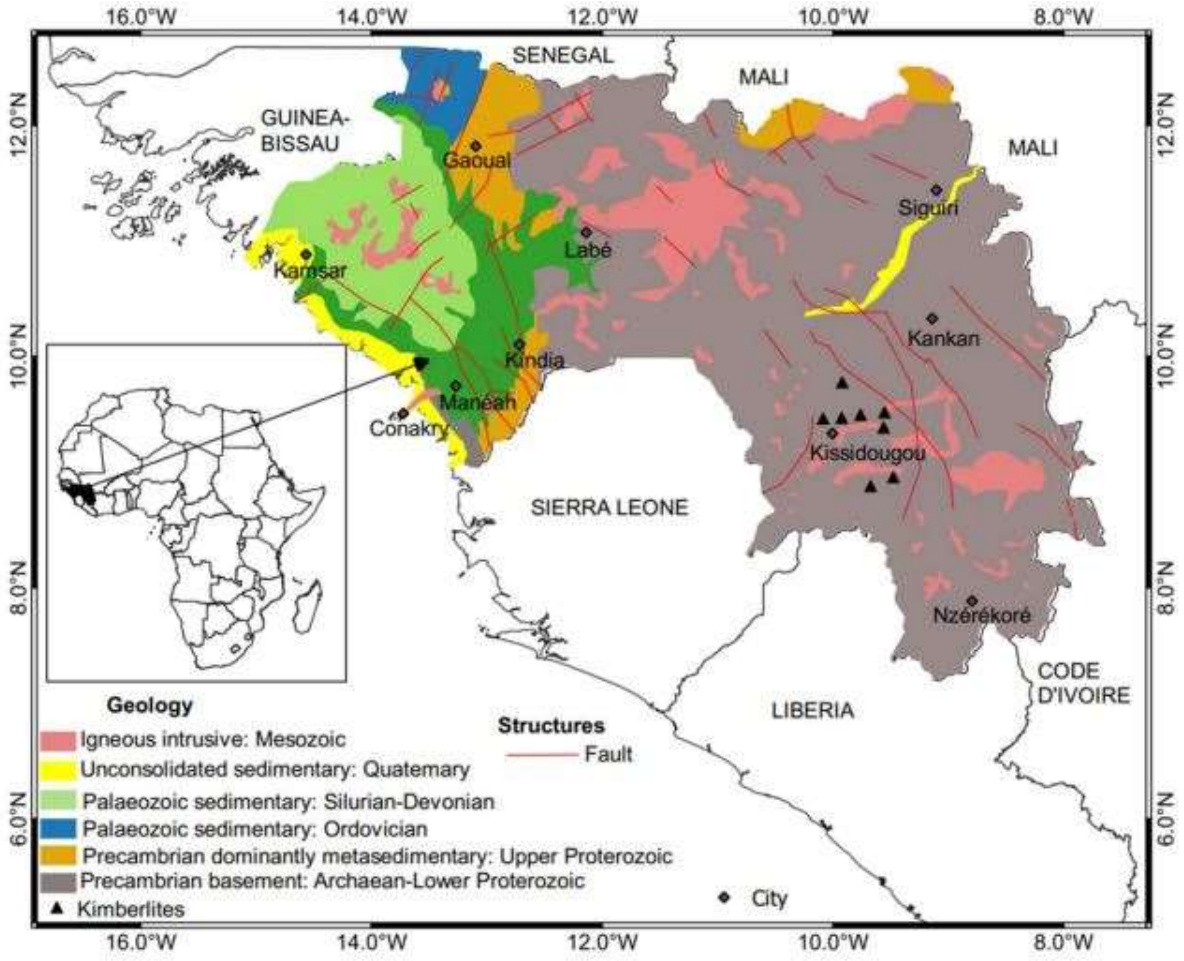


Figure 4.3: Geologic Map of Guinea

(Stephen *et al*., 2022)

Regional and Local Geology

Boke region consists of an upper Proterozoic basement overlain by marine sedimentary rocks and volcanic deposits of the Palaeozoic age (Zhang *et al*., 2018). The proposed project area is characterized by Palaeozoic deposits, including sedimentary strata of the Pita suite (Ordovician), Télimélé suite (Silurian), and Faro Suite (Devonian). Fundamentally, in the project area, the Pita suite is represented by quartz sandstone, pebble conglomerate and conglomerate, the Télimélé suite by argillites, siltstones and shales, and the Faro suite by siltstones, argillites and fine-grained sandstones as shown in Figure 4.4.

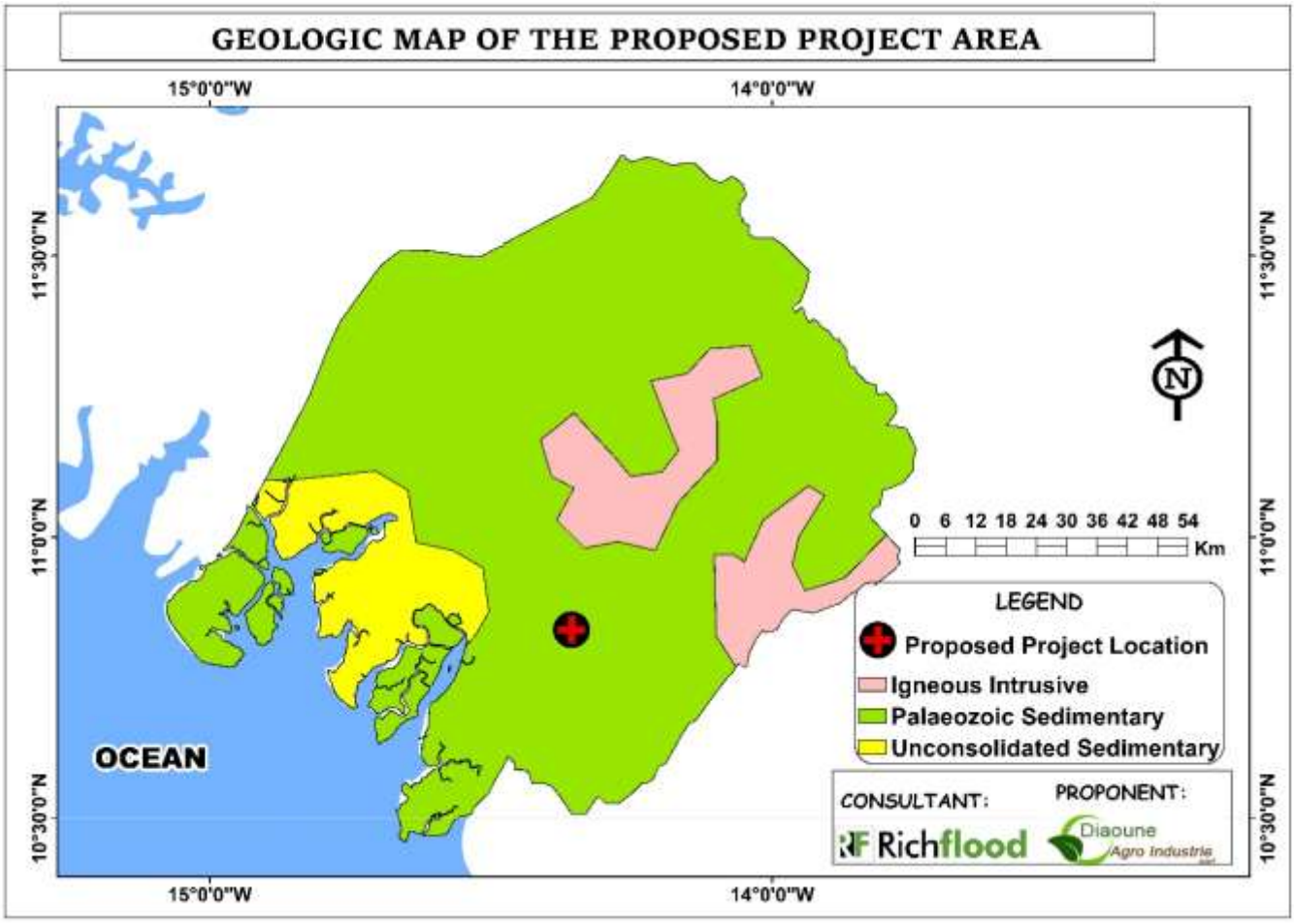


Figure 4.4: Geologic Map of the Proposed Project Area
(Modified from Stephen et al., 2022)

4.3.3 Topography, Relief and Drainage

The general landscape of the project area consists of relatively flat and undulating land. The landscape within the project area is adapted to vegetation and crop cultivation with most of the area having slopes under 50 degrees. The elevation of the project AOI ranges from 8 to 44 meters above the mean sea level. The lowest elevation is at the northwestern side of the project area while the highest elevation is at the eastern part of the project area.

A Digital Elevation Model (DEM) of the terrain surface of 5 km Project AOI is shown with the height range in Figure 4.5. Contours of the Project AOI are generated from the Advanced Spaceborne Thermal Emission and Reflection Radiometer (ASTER) relief maps and relevant

information are extracted from the Shuttle Radar Topography Mission (SRTM) DEM. All the processing was completed using the ArcGIS 10.7 and Surfer softwares.

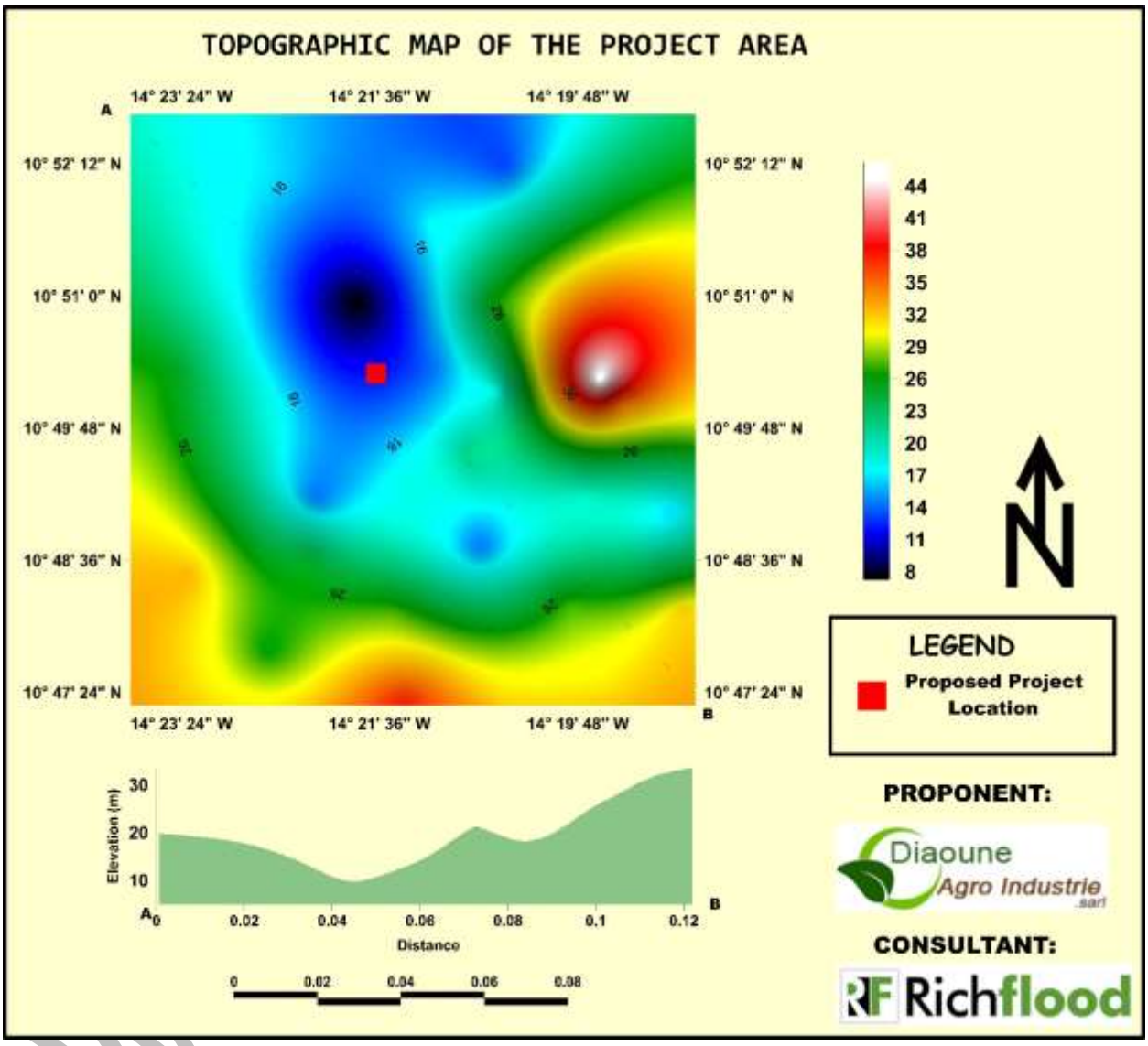


Figure 4.5: Topographic map of the project area
Source: Richflood, 2020

4.3.4 Soil

Nearly half of Guinea Republic is underlain by Pre-Cambrian granitic bedrock, thus the soils above those surfaces exhibit a certain amount of uniformity (Ahn, 1970). Representations of the

distribution of Guinea's soil resources vary considerably, reflecting different classification systems. Although each of the categorizations identify soil types, there is little apparent overlap in the distribution of these soils. Functionally, most of Guinea's soils are considered to possess low levels of fertility. Only a narrow belt of terrain straddling Upper Guinea and the Forest Region approaches medium levels of inherent fertility.

As illustrated in Figure 4.6, Guinea exhibits seven (7) different soil types, which are subdivided into 12 classes based on the mineral composition. The seven (7) major classes are: Sols Hydromorphes, Lithosols, Sols Ferrallitiques, Ferrisols, Soils Fersiallitiques, Sols Bruns, and Vertisols. The Study area in Boke is underlain by Lithosols and specifically undeveloped soils rich in ferriginous minerals (lateritic soils).

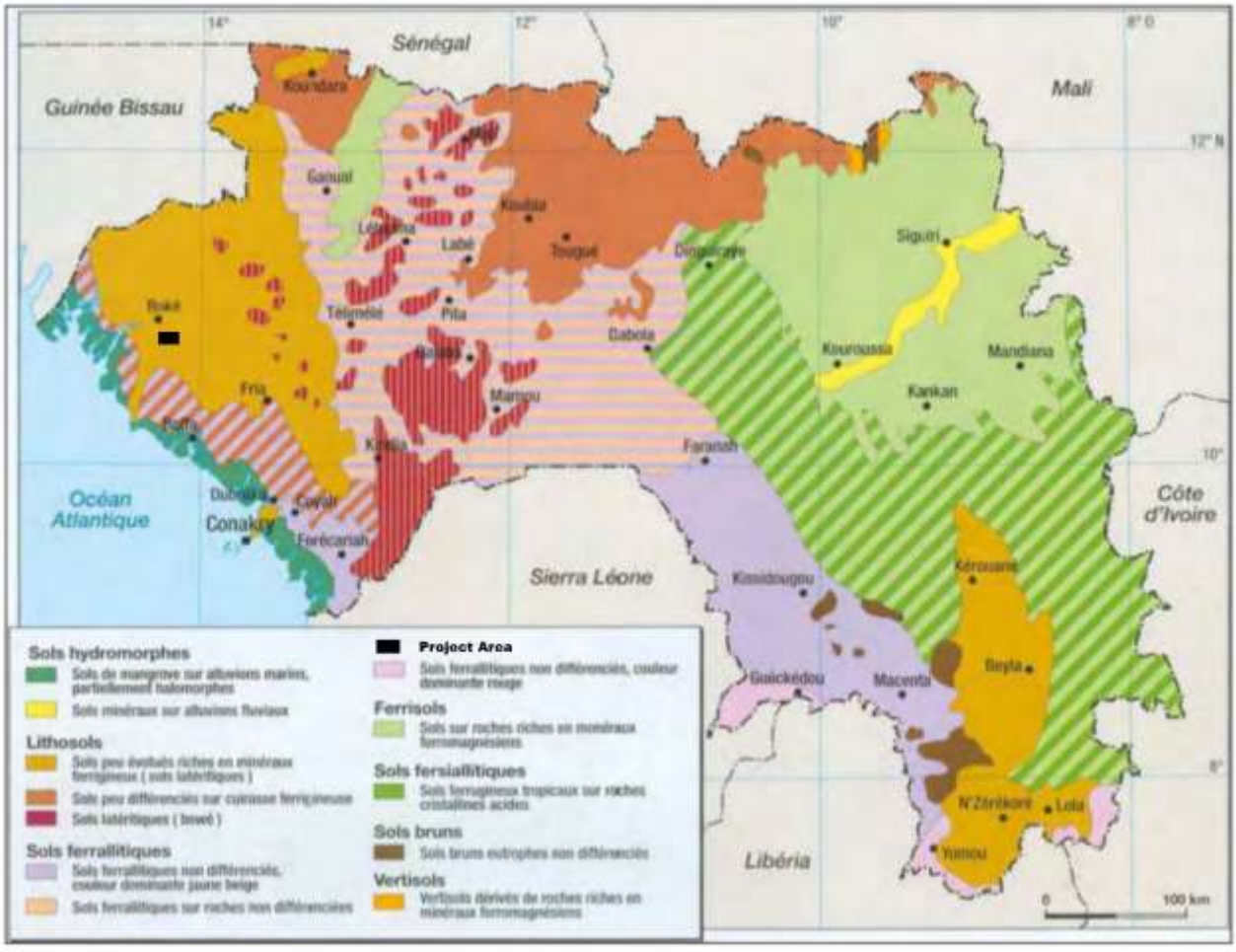


Figure 4.6: General Soil Map for Guinea Republic
Source: USAID, 2012

4.3.5 Landcover

According to the GlobeLand30 database (2019), most of the area is classified as woodland, with portions of grassland and shrubland still present in the local area. Data from the West African Land Use Dynamics project (Cotillon, 2017) show there has been an increase from 2000 to 2013 in the extent of agricultural, mining, plantation, settlements, water bodies and thickets land cover for Upper Guinea, which forms the ecoregion for the project area. There was a notable change (or loss) of forest cover between 1975 and 2013 north of the project area, with an overall increase in the extent of degraded forest and plantation cover for the general area in 2013.

4.3.6 Water Quality

Water sampling and analysis was undertaken to understand the overall baseline water quality characteristics of the surface and groundwater in the Project AOI. The surface water sampling was based on the identification of the major surface water body and its interaction with the project e.g. Rio Nuñez River. Groundwater sampling locations were selected to obtain representative water samples from various zones within the AOI. The samples were collected from existing boreholes (hand pumps being used by the villagers) and wells.

Approach and Methods

A total of 8 samples, (2) surface water and six (6) groundwater samples were collected. The samples were analysed as per standard procedure/method given in Standard Method for Examination of Water and Wastewater Edition 22, published by the American Public Health Association (APHA). Details of the analysis method and protocol are presented in ***Table 4.1***

Table 4.1 Method for Water Analysis

S/N	Parameter	Method	Protocol
1.	Colour	Visual Comparison	Colourless
2.	Odour	Sensory	Odourless
3.	Temperature	Thermometric	APHA 2550B
4.	pH	Electrometric	APHA 2120B
5.	Dissolved Oxygen	Electrometric	APHA 4500-O G
6.	Total Dissolved Solids	Electrometric	APHA 2540C
7.	Electrical Conductivity	Electrometric	APHA 2510B

S/N	Parameter	Method	Protocol
8.	Salinity	Electrometric	APHA 2520C
9.	Total Suspended Solid	Gravimetric	APHA 2540D
10.	Turbidity	Nephelometric	APHA 2130B
11.	Total Alkalinity	Titrimetric	APHA 2320B
12.	Total Hardness	EDTA Titrimetric	APHA 2340C
13.	Chemical Oxygen Demand	Colorimetric	APHA 5220D
14.	Biochemical Oxygen Demand	BOD 5 day	APHA 5210B
15.	Nitrate (NO_3^-)	Colorimetric	APHA 4500-NO^-_2 B
16.	Nitrite (NO_2)	Colorimetric	APHA 4500-NO^-_3 B
17.	Sulphate (SO_4^{2-})	Turbidimetric	APHA 4500-SO_4 E
18.	Phosphate (PO_4^{3-})	Colorimetric	APHA 4500-P C
19.	Phosphorus (P)	Colorimetric	APHA 4500-P C
20.	Total Chlorine	DPD Colorimetric	APHA 4500- Cl G
21.	Magnesium(Mg)	Colorimetric	APHA 3500-Mg-B
22.	Calcium(Ca)	Atomic Absorption Spectroscopy	APHA 3500-Ca B
23.	Potassium (K)	Atomic Absorption Spectroscopy	APHA 3500-K B
24.	Aluminium (Al)	Atomic Absorption Spectroscopy	APHA 3500-Al B
25.	Manganese (Mn)	Atomic Absorption Spectroscopy	APHA 3500-Mn B
26.	Iron (Fe)	Atomic Absorption Spectroscopy	APHA 3500-Fe B
27.	Copper (Cu)	Atomic Absorption Spectroscopy	APHA 3500-Cu C
28.	Lead (Pb)	Atomic Absorption Spectroscopy	APHA 3500-Pb B
29.	Cadmium	Atomic Absorption Spectroscopy	APHA 3500-Cd B
30.	Chromium	Colorimetric	APHA 3500-Cr B
31.	Total Coliform Count	Multiple Tube Technique	APHA 9225
32.	Total Bacteria Count	Pour Plate	APHA 9215
33.	*Escherichia coli*	*Escherichia coli* Procedure	APHA 9221- E
34.	*Salmonella sp.*	*Salmonella sp.* Procedure	APHA 9260B

Source: Laboratory Report, November, 2022

There is no Guinean groundwater and surface water regulation/standard. In the absence of local country standards, it is Richflood's practice to use globally recognized `World Health Organization Guidelines for Drinking Water Quality, 2017` and the ´US Environmental Protection Agency (EPA) surface quality water guidelines`. The quality of surface water was compared with the US Environmental Protection Agency (EPA) surface quality water guidelines for *Aquatic Life* and *Human Health for Consumption and Organism*.

The groundwater was compared with the World Health Organization (WHO) *Drinking Water Standard* for comparison.

Surface Water Quality

The main water bodies within the Boke region include the River Rio Nuñez and Tinguilinta which flows north-west of the project area and empties into the Atlantic Ocean. The project site and surrounding AoI is drained by numerous perennial fresh water streams, considering the low lying vegetation of the area. The extensive network of streams within the area flows northwards of the project area, dissecting the lowland forest where it joins the River Rio Nuñez. The River Rio Nuñez and some of its tributaries are navigable, supporting barge and passenger traffic during for local residents in the area. Also the extensive fresh water stream systems provide various ecological services to the local residents' chief amongst is source of water for domestic use.

Two (2) surface water samples were collected (upstream and downstream) from a freshwater stream flowing across the edge of the western boundary of the project site. The surface water sampling locations in relation to the project area are illustrated in Figure 4.7 and sampling location coordinate is summarized in Table 4.2.

Table 4.2: Surface water sampling location

Sampling Code/ Description	**Coordinates**		**Elevation (m)**
	Longitude (W)	**Latitude (N)**	
SW_1 (Upstream)	14^O 21' 23.46"	10^O 50' 24.02"	8
SW_2 (Downstream)	14^O 21' 23.46"	10^O 50' 24.02"	6

***Source**: Richflood, 2022*

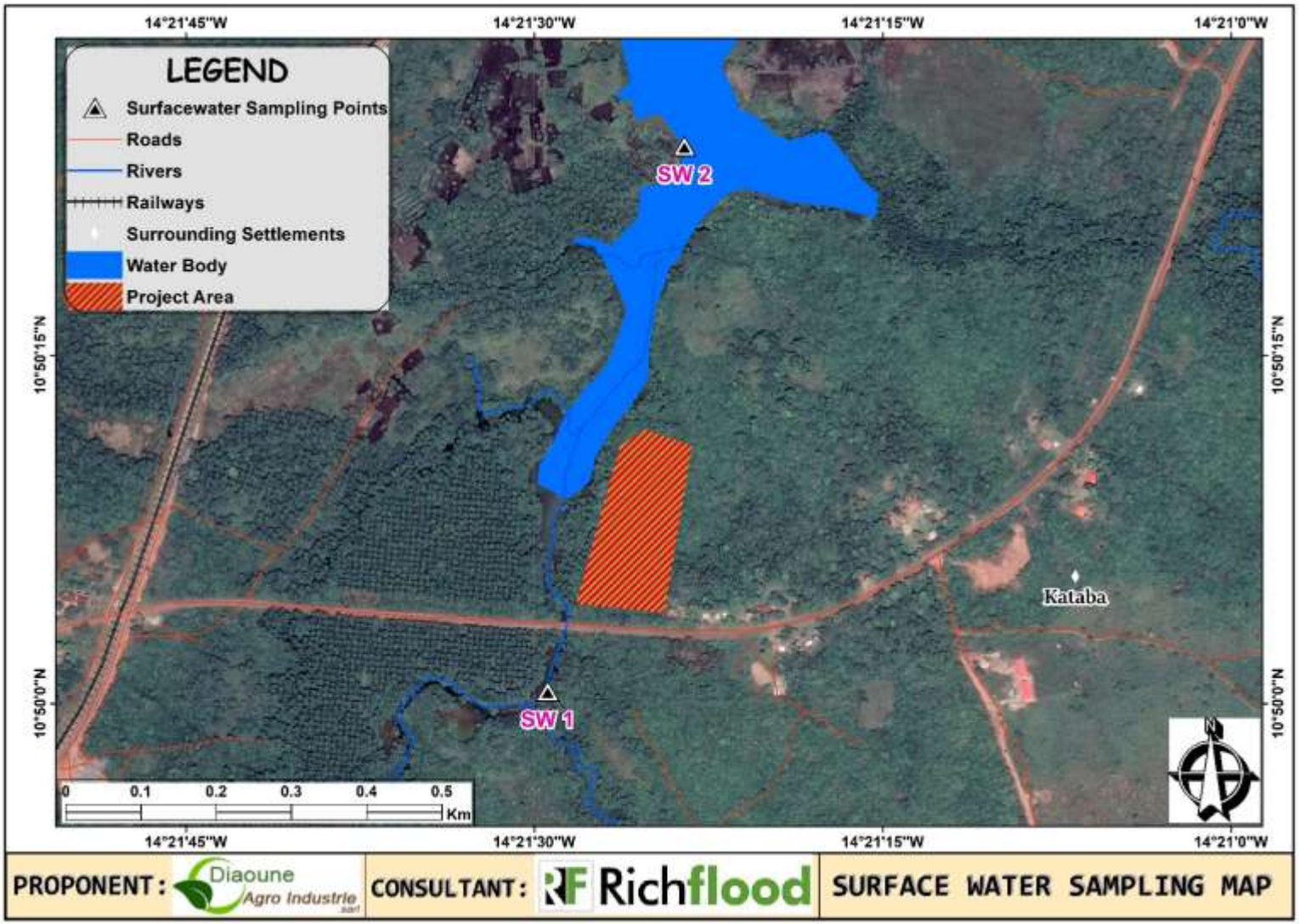


Figure 4.7: Surfacewater Sampling Map
Source: Richflood, 2022

Table 4.3: Details of Surface water Locations

S/N	Sample Location	Code	Geographical Location	Source	Justification for selection of location
1.	Freshwater Stream Upstream of Projects water intake point	SW_1	10° 50' 2.5″N 14º 21′ 28.7W	River (Upstream)	Representing water quality upstream of water intake
2.	Freshwater Stream Downstream of Projects water intake point	SW_2	10° 50'23.7″N 14º 21′23.4″W	River (Downstream)	Representing water quality upstream of water intake

The samples were analysed for parameters covering physical, chemical and microbiological characteristics as mentioned in the scope of work which includes certain heavy metals, trace elements and toxic constituents.

The water samples were collected in 1-litre PET bottles for general Physico-chemical analysis. Samples for heavy metals analysis were collected separately in plastic containers acidified with concentrated Nitric acid. Pre-sterilized 50ml McCartney bottles were used for samples meant for microbial analysis. *In-situ* measurements of fast degrading parameters including pH, Conductivity, Total Dissolved Solids (TDS), Temperature, and Dissolved Oxygen (DO) were taken at each location using calibrated Bante 900P-UK Multiparameter Water Quality Meter. All samples collected were preserved on ice chest and transported to the Laboratory for further analysis.

Table 4.4: Surface Water Quality Analysis

S/N	PARAMETER	UNIT	RESULT		STANDARD	
			SW_1 Freshwater Stream (Upstream)	SW_2 Freshwater Stream (Downstream)	US EPA Aquatic Life Criteria (Chronic)	US EPA Human Health for Consumption and Organism
IN-SITU ANALYSIS						
1.	Colour	TCU	Clear	Clear	NS	NS
2.	Odour	TN	Odourless	Odourless	NS	NS
3.	Temperature	^{0}C	28.50	28.50	NS	NS
4.	pH	-	5.78	5.78	6.50 – 9.00	6.50 – 9.00

S/N	PARAMETER	UNIT	RESULT		STANDARD	
			SW_1 Freshwater Stream (Upstream)	SW_2 Freshwater Stream (Downstream)	US EPA Aquatic Life Criteria (Chronic)	US EPA Human Health for Consumption and Organism
5.	Dissolved Oxygen	mg/L	7.58	7.58	NS	NS
6.	Total Dissolved Solids	mg/L	5.58	5.59	NS	250.00
7.	Electrical Conductivity	µS/cm	10.28	10.30	NS	NS
8.	Salinity	mg/L	2.00	3.00	NS	25.00
CHEMICAL ANALYSIS						
9.	Total Suspended Solids	NTU	4.00	56.00	NS	NS
10.	Turbidity	mg/L	10.50	11.00	NS	NS
11.	Total Alkalinity	$mgCaCO_3/L$	20.00	20.00	20.00	NS
12.	Total Hardness	$mgCaCO_3/L$	20.00	50.00	NS	NS
13.	Chemical Oxygen Demand	mg/L	29.00	13.00	NS	NS
14.	Biochemical Oxygen Demand	mg/L	11.33	3.41	NS	NS
15.	Nitrate (NO_3^-)	mg/L	2.10	<0.01	NS	10.00
16.	Nitrite (NO_2)	mg/L	0.025	0.011	NS	NS
17.	Sulphate (SO_4^{2-})	mg/L	1.00	<0.01	NS	NS
18.	Phosphate (PO_4^{3-})	mg/L	1.00	<0.01	NS	NS
19.	Phosphorus (P)	mg/L	0.03	0.02	NS	NS
20.	Total Chlorine	mg/L	<0.01	<0.01	NS	NS
METALS/HEAVY METAL ANALYSIS						
21.	Magnesium(Mg)	mg/L	0.960	0.809	NS	NS
22.	Calcium(Ca)	mg/L	3.11	<0.001	NS	NS
23.	Potassium (K)	mg/L	2.75	<0.001	NS	NS
24.	Aluminium (Al)	mg/L	0.223	0.230	NS	NS
25.	Manganese (Mn)	mg/L	0.070	0.090	NS	0.05
26.	Iron (Fe^{2+}/ Fe^{3+})	mg/L	<0.001	0.080	1.00	NS
27.	Copper (Cu)	mg/L	<0.001	<0.001	NS	1.30
28.	Lead (Pb)	mg/L	<0.001	0.05	0.0025	NS
29.	Cadmium	mg/L	<0.001	<0.001	0.00072	NS

S/N	PARAMETER	UNIT	RESULT		STANDARD	
			SW_1 Freshwater Stream (Upstream)	SW_2 Freshwater Stream (Downstream)	US EPA Aquatic Life Criteria (Chronic)	US EPA Human Health for Consumption and Organism
30.	Chromium	mg/L	1.551	1.405	0.074	NS
MICROBIOLOGICAL ANALYSIS						
31.	Total Coliform Count	MPN/100 ml	Absent	Absent	NS	NS
32.	Total Bacteria Count	CFU/ml	1.40×10^2	1.7×10^2	NS	NS
33.	*Escherichia coli*	CFU/ml	Absent	Absent	NS	NS
34.	*Salmonella sp.*	CFU/ml	Absent	Absent	NS	NS

MPN= Most Probable Number, ***CFU***=Colony forming unit, ***NS*****:** Not Specified, ***TN:*** Threshold Number, ***TCU***: True Colour Unit**, Detection Limits** (0.01; 0.001) ***Limit Source****:* US Environmental Protection Agency (EPA) surface quality water guidelines
Source: Richflood Laboratory, November 2022.

Surface Water Quality

The quality of surface water was compared with the US Environmental Protection Agency (EPA) surface quality water guidelines for Aquatic Life and Human Health for Consumption and Organism. ***Table 4.4*** shows the analysis results.

Some of the water analysis parameters are discussed below in detail:

pH

All results for pH in surface water (5.78) are not within range of the permissible limits of 6.5 to 9.0. The results of the pH indicate that the surface water is slight acidic, which could be due to the nature of the underlying rock of the area (unconsolidated sandstones and siltstones), which is acidic in composition.

Dissolved Oxygen (DO)

DO of all two samples is 7.58 mg/L

Biochemical Oxygen Demand (BOD)

The BOD levels range between 3.41 to 11.33 mg/L.

Total Alkalinity

The total alkalinity of all surface water samples is 20.00mg/L and meet the US EPA surface water standard limit for Aquatic Life Criteria of 20.00mg/L for aquatic life.

Nitrate

The nitrate content of the water sampled at the upstream is 2.10mg/L while nitrate level of water sampled downstream was below detection limit. This shows that the nitrate level of the surface water is below the US EPA permissible standard of 10mg/L for Human Health for Consumption and Organism.

Coliform levels

Both the total coliform and Escherichia coli levels were found to be absent in the surface water samples.

Iron

The iron content of the Freshwater sample collected upstream is below detection limit, while iron level at downstream is 0.08mg/L, which is below US EPA permissible standard of 1mg/L for Aquatic Life.

Chromium

The chromium levels of the surface water range from 1.405 to 1.551mg/L which exceeds US EPA permissible standard of 0.074mg/L for Aquatic Life.

Lead

The level of lead in water sample collected upstream was below detection limit, while the lead content at downstream is 0.05 which exceeds US EPA permissible standard 0.0025mg/L for Aquatic Life.

Other Heavy Metals

Other heavy metals analysed in the samples of the freshwater stream collected such as Copper and Cadmium were found to be below the detection limits.

Groundwater Quality

The only sizable true aquifers in Guinea are situated along the coast, within the sedimentary basin. The remainder of the country is underlain by bedrock having very little, if any, porosity. Nevertheless, there have been surveys of the terrain, concentrating on areas adjoining population centers. A permanent Hungarian hydrological mission spent more than a decade, from 1960, evaluating prospects for groundwater exploitation. In the coastal areas, particularly the Kaloum peninsula which contains Conakry and along the Rio Nunez estuary further north, groundwater

supplies exist and are being used. Yields per well in these areas are relatively high at 20 to 50 cubic meters per hour (cu m/hr).

Elsewhere, prospects are not as sanguine. Groundwater potential is probably greatest in the vicinity of springs lying on volcanic terrain in the Fouta Djallon. In areas lying above shaly sandstones and quartzites, water may be present, but typical yields are very low (based upon drilling in neighboring countries), rarely exceeding 3 cu m/hr. In the zones underlain by crystalline and metamorphic rocks--nearly three-quarters of the country expected yields are also low, perhaps in the range of 1 to 10 Cu m/hr. For the near future, it remains unlikely that aquifers can supply the nation's water needs, except perhaps along the alluvial coastal strip.

Six (6) groundwater samples were collected from the boreholes and well sources within the project area and the surrounding communities. The groundwater sampling locations in relation to the project area are illustrated in figure 4.7 and sampling location coordinate is summarized in Table 4.5.

Table 4.5: Groundwater Sampling location

Code	Location Description	Coordinates		Elevation (m)
		Latitude (N)	Longitude (E)	
GW_1	Factory Site	10° 50' 4.0″	14º 21′ 24.7″	15
GW_2	Fodecontea Village	10° 49' 59.7″	14º 21′ 55.2″	21
GW_3	Kataba Village	10° 50' 10″	14º 21′ 6.4″	66
GW_4	Tambouni Village	10° 48' 59.6″	14º 22′ 44.1″	41
GW_5	Kataba Fula	10° 48' 47.8″	14º 20′ 2.3″	33
GW_6	Tamaransi Village	10° 52' 29.0″	14º 18′ 38.6″	18

Source: Richflood Fieldsurvey, 2022

Figure 4.8: Groundwater Sampling Map

Source: Richflood, 2022

Table 4.6 Details of Ground Water Sampling Locations

S/N	Sample Location	Code	Geographical Location	Source	Justification for selection of location
1	Factory Site	GW_1	10° 50' 4.0″N 14º 21′ 24.7″W	Borehole	Represents ground water quality at projects site
2.	Fodecontea Village	GW_2	10° 50' 10″N 14º 21′ 6.4″W	well	Represents ground water in the host community
3.	Kataba Village	GW_3	10° 49' 59.7″N 14º 21′ 55.2″W	Borehole	Represents ground water in the host community
4.	Tambouni Village	GW_4	10° 48' 59.6″N 14º 22′ 44.1″W	Borehole	Represents ground water in the host community
5	Kataba Fula	GW_5	10° 48' 47.8″ 14º 20′ 2.3″	Borehole	Represents ground water in the host community
6.	Tamaransi Village	GW_6	10° 52' 29.0″ 14º 18' 38.6″	Borehole	Represents ground water in the host community

The results of six groundwater samples collected from the boreholes and the wells around the study area are shown in Table 4.7.

Table 4.7: Groundwater Quality Analysis

S/N	PARAMETER	UNIT	RESULT						WHO Drinking Water Standard
			GW_1 Factory Site	GW_2 Kataba Susu	GW_3 Fodecontea	GW_4 Tambouni	GW_5 Kataba Fula	GW_6 Tamaransi	
IN-SITU ANALYSIS									
1.	Colour	TCU	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless	Colourless
2.	Odour	TN	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless	Odourless
3.	Temperature	^0C	29.00	31.00	33.20	33.40	33.50	29.10	NS
4.	pH	-	9.04	5.63	6.19	6.37	5.76	6.76	6.50- 8.50
5.	Dissolved Oxygen	mg/L	9.04	2.69	3.45	5.33	5.25	4.93	7.50
6.	Total Dissolved Solids	mg/L	20.40	11.62	13.87	34.60	19.78	29.76	NS
7.	Electrical Conductivity	µS/cm	40.90	23.20	27.70	69.10	39.50	59.10	NS
8.	Salinity	mg/L	24.00	3.00	2.00	4.00	4.00	4.00	NS
CHEMICAL ANALYSIS									
9.	Total Suspended Solids	mg/L	2.00	2.00	197.00	6.00	135.00	2.00	NS
10.	Turbidity	NTU	0.900	<0.001	<0.001	<0.001	0.100	<0.001	NS
11.	Total Alkalinity	$mgCaCO_3$/ L	290.00	70.00	40.00	60.00	20.00	40.00	NS
12.	Total Hardness	$mgCaCO_3$/ L	44.00	64.00	44.00	42.0	40.00	42.00	80 - 100
13.	Chemical Oxygen Demand	mg/L	15.00	139.00	9.00	5.00	148.00	15.00	NS
14.	Biochemical Oxygen Demand	mg/L	11.08	0.33	9.58	8.91	12.00	8.33	NS
15.	Nitrate (NO_3^-)	mg/L	7.50	4.40	4.40	7.90	10.00	6.70	50.00
16.	Nitrite (NO_2)	mg/L	0.157	0.032	<0.01	0.028	0.020	<0.001	3.00
17.	Sulphate (SO_4^{2-})	mg/L	4.00	<0.01	<0.01	1.00	12.00	<0.001	NS
18.	Phosphate (PO_4^{3-})	mg/L	0.180	0.37	0.26	<0.01	0.04	0.06	NS
19.	Phosphorus (P)	mg/L	0.120	0.120	0.140	<0.01	0.01	0.02	NS
20.	Total Chlorine	mg/L	0.02	0.01	0.06	0.02	0.01	0.06	5.00
METALS/HEAVY METAL ANALYSIS									
21.	Magnesium(Mg)	mg/L	1.260	1.015	0.369	1.773	1.619	1.603	0.30
22.	Calcium(Ca)	mg/L	<0.001	<0.001	<0.001	4.270	<0.001	<0.001	NS

S/N	PARAMETER	UNIT	RESULT						WHO Drinking Water Standard
			GW_1 Factory Site	GW_2 Kataba Susu	GW_3 Fodecontea	GW_4 Tambouni	GW_5 Kataba Fula	GW_6 Tamaransi	
23.	Potassium (K)	mg/L	2.660	<0.001	<0.001	1.430	2.740	1.910	NS
24.	Aluminium (Al)	mg/L	<0.001	0.035	0.276	0.266	0.408	<0.001	0.200
25.	Manganese (Mn)	mg/L	0.070	0.010	0.040	0.100	<0.001	0.040	NS
26.	Iron (Fe)	mg/L	<0.001	0.070	<0.001	<0.001	0.070	<0.001	NS
27.	Copper (Cu)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	2.00
28.	Lead (Pb)	mg/L	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	0.01
29.	Cadmium (Cd)	mg/L	0.010	0.040	0.090	<0.001	<0.001	<0.001	0.003
30.	Chromium (Cr)	mg/L	1.347	1.244	1.402	0.888	1.435	0.962	0.05
MICROBIOLOGICAL ANALYSIS									
31.	Total Coliform Count	MPN/100 ml	Absent	Absent	Absent	Absent	Absent	Absent	0.00
32.	Total Bacteria Count	CFU/ml	2.0×10^{1}	3.7×10^{1}	1.8×10^{1}	9.0×10^{1}	3.1×10^{1}	1.2×10^{1}	1.0×10^{2}
33.	*Escherichia coli*	MPN/100 ml	Absent	Absent	Absent	Absent	Absent	Absent	0.00
34.	*Salmonella sp.*	CFU/ml	Absent	Absent	Absent	Absent	Absent	Absent	0.00

MPN= Most Probable Number, ***CFU***=Colony forming unit, ***NS*****:** Not Specified, ***TN:*** Threshold Number, ***TCU***: True Colour Unit, **Detection Limit** (0.01; 0.001), **WHO*:*** World Health Organization ***Source:*** Richflood Laboratory, November 2022. ***Limit Source:*** World Health Organization Guidelines for Drinking Water Quality, 2017.

The key parameters in groundwater are discussed below, compared with the World Health Organization Standards for drinking water.

pH

The pH values of the groundwater range from 5.63 to 9.04. As observed from the test result, the groundwater sampled at GW_2 (Kataba Susu), GW_3 (Fodecontea), GW_4 (Tambouni) and GW_5 (Kataba Fula) were slightly acidic with pH values of 5.63, 6.19, 6.37, and 5.76 respectively. These values were below the WHO drinking water standard pH range of 6.50 - 8.50, while the groundwater sampled at GW_1 (Factory Site) and GW_6 (Tamaransi) recorded pH of 9.01 and 6.76 respectively. This indicates that only the pH values of the groundwater sampled at Tamaransi is within the WHO drinking water standard for pH.

Total Dissolved Solid (TDS)

The total dissolved solids content of the groundwater ranged from 11.62 to 34.60mg/L.

Total Hardness (as $CaCO_3$)

Total Hardness of the groundwater range from 40.00 to 64.00mg/L which are below the WHO standard range of 80 to 100mg/L.

Nitrate

The nitrate content of the groundwater range from 4.40 to 10.00mg/L which are below the WHO permissible standard of 50mg/L.

Nitrite

The nitrite contents of the groundwater at Fodecontea and Tamaransi communities were below equipment detection limit, while nitrite content of the groundwater at the factory site, Kataba Susu, Tambouni and Kataba Fula communities ranged from 0.020 to 0.157mg/L which are within the WHO permissible standard of 3mg/L.

Total Chlorine

The total chlorine content of the groundwater samples ranges from 0.01 − 0.06mg/L which are well below the WHO permissible standard.

Coliform

Both the total coliform and *Escherichia coli* levels were found to be absent in the ground water samples meeting the drinking water standard requirement of 0 number/100ml.

Magnesium and Aluminium

The magnesium content of the groundwater samples ranges from 0.369 to 1.7773mg/L. These values exceed the WHO standard limit of 0.3mg/l indicating high magnesium content in the ground waters of the project area.

The aluminium content of the groundwater at the Factory site and Tamaransi communities was below detection limit, while aluminium content of the groundwater at Fodecontea, Tambouni and Kataba Fula communities range from 0.266 to 0.408mg/L which exceeds WHO permissible standard of 0.2mg/L. As also observed, groundwater at Kataba Sus has an aluminium content of 0.035mg/Which is below the WHO permissible limit.

Chromium and Cadmium

The Chromium content of the groundwater ranges from 0.888 to1.435mg/L which exceeds WHO standard limit of 0.05mg/L.

The Cadmium levels of the groundwater at Fodecontea, Tambouni and Kataba Fula Factory site, Kataba Susu and Fodecontea communities are below detection limit, while its levels at the Factory site, Kataba Susu and Fodecontea communities ranged from 0.010 to 0.090mg/L which exceeds WHO permissible standard of 0.003mg/L.

Other Heavy Metals

Other heavy metals such as Copper and Lead were below the detection limits in all the groundwater samples in the area.

4.3.7 Soil Quality

Sampling Methodology and Locations

The soil sampling strategy was designed to assess the existing soil quality over the study area. Samples were collected from a total eight (8) locations within the study area. The detail of the

sampling locations is presented in ***Table 4.8***. A composite sampling technique1 was used for soil sampling from each location.

Table 4.8 Location of Soil Samples

S/N	Sample Location	Code	Geographical Location	Land use and justification
1.	Project Location	SS_1	10° 50' 11.1″N 14º 21′ 26.4″W	Project Area of Influence
2.	Cashew Farm	SS_2	10° 51' 21.1″N 14º 20′ 9.8″W	Project Area of Influence
3.	Kataba Village	SS_3	10° 50' 10″N 14º 21′ 6.4″W	Project Area of Influence
4.	Fodecontea Village	SS_4	10° 49' 59.7″N 14º 21′ 55.2″W	Project Area of Influence
5.	Tambouni Village	SS_5	10° 48' 59.6″N 14º 22′ 44.1″W	Project Area of Influence
6.	Tamaransi Village	SS_6	10° 52' 29.0″N 14º 18′ 38.6″W	Project Area of Influence
7.	Tambobo Village	SS_7	10° 50' 12.0″N 14º 23′ 13.9″W	Project Area of Influence
8.	Kataba Fula	SS_8	10° 48' 47.8″N 14º 20′ 2.3″W	Project Area of Influence

Soil samples were collected using tools from a depth of 45 cm from the top soil surface. At each location, soil samples were collected from three spots and homogenized. The homogenized samples were collected following quartering technique and then packed in polythene plastic jars and sealed. The sealed samples were sent to the laboratory for analysis.

Analysis Results and Discussions

The analysis results of physico-chemical parameters of soil samples are presented in Table 4.9 below.

Table 4.9: Soil Quality

S/N	PARAMETER		UNIT	SS_1 Project Site	SS_2 Cashew Farm	SS_3 Kataba Community	SS_4 Fodacontea	SS_5 Tambobo Community	SS_6 Tambouni Community	SS_7 Kataba Fula Community	SS_8 Tamaransi Community
IN-SITU ANALYSIS											
1.	Colour		-	Reddish Yellow 7.5YR6/6	Reddish Yellow 7.5YR6/8	Light Brown 7.5YR6/3	Light Brown 7.5YR6/3	Brown 7.5YR5/3	Reddish Brown 7.5YR6/6	Brown 7.5YR5/4	Pink 7.5YR5/3
2.	pH		-	6.21	6.10	6.31	7.91	5.58	7.74	6.02	5.33
3.	Temperature		˚C	26.10	28.00	33.10	30.20	26.2	27.80	27.90	30.30
4.	Electrical Conductivity		µS/cm	60.40	59.20	67.40	65.70	89.00	86.60	72.30	77.00
5.	Particle Size Distribution	Sandy	%	87	77.0	76.00	72.00	71.00	70.00	74.00	74.00
		Clay		3.60	5.00	4.00	8.00	8.00	10.00	10.00	10.00
		Silt		9.40	18.00	20.00	20.00	21.00	20.00	16.00	16.00
6.	Texture		-	Loamy sand	Sandy Loamy	Loamy Sand	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam	Sandy Loam
7.	Bulk Density		g/cm^3	1.15	1.36	1.39	39.70	0.92	0.84	0.73	0.65
8.	Permeability		-	Moderate	Moderate	Low	Low	Low	Low	Low	Low
9.	Porosity		%	32.10	30.10	28.50	29.70	22.30	18.00	17.50	15.00
10.	Moisture Content		%	12.00	19.00	15.00	13.50	11.00	8.00	6.50	4.00
CHEMICAL ANALYSIS											
11.	Nitrate		mg/kg	1.10	1.40	1.30	1.20	2.10	2.30	4.70	8.60
12.	Sulphate		mg/kg	1.00	<0.01	<0.01	3.00	3.00	<0.01	2.00	1.00
13.	Phosphate		mg/kg	0.05	0.04	0.07	0.06	0.04	0.09	0.08	0.10
14.	Phosphorus		mg/kg	0.372	0.388	0.392	0.284	0.481	0.663	0.665	0.452
METALS/HEAVY METAL ANALYSIS											
15.	Potassium(K)		mg/kg	<0.001	<0.001	0.040	<0.001	<0.001	0.630	0.590	0.500
16.	Aluminium (Al)		mg/kg	0.164	0.221	0.629	0.497	0.592	0.656	0.773	0.912
17.	Cobalt (Co)		mg/kg	0.814	0.646	0.358	0.159	1.636	0.846	0.571	0.650
18.	Iron (Fe)		mg/kg	<0.001	0.350	0.160	<0.001	<0.001	<0.001	<0.001	0.300
19.	Lead (Pb)		mg/kg	<0.001	<0.001	<0.001	1.510	<0.001	<0.001	<0.001	<0.001
20.	Zinc (Zn)		mg/kg	0.210	<0.001	<0.001	0.580	<0.001	0.160	0.060	0.230
21.	Manganese(Mn)		mg/kg	0.210	0.200	<0.001	<0.001	<0.001	<0.001	0.610	<0.001
22.	Calcium(Ca)		mg/kg	<0.001	<0.001	2.480	<0.001	0.040	0.250	0.030	0.060
MICROBIOLOGICAL ANALYSIS											
23.	Total Heterogenic Bacteria		CFU/g	3.0×10^1	2.2×10^1	7.6×10^1	9.20×10^1	6.4×10^1	9.3×10^1	3.7×10^1	1.2×10^1
24.	Total Coliform Count		CFU/g	2.1×10^1	1.2×10^1	1.8×10^1	3.0×10^0	1.7×10^1	Absent	7.0×10^1	5.0×10^0

S/N	PARAMETER	UNIT	SS_1 Project Site	SS_2 Cashew Farm	SS_3 Kataba Community	SS_4 Fodacontea	SS_5 Tambobo Community	SS_6 Tambouni Community	SS_7 Kataba Fula Community	SS_8 Tamaransi Community
25.	E , Coliform	CFU/g	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
26.	Faecal Coliform	CFU/g	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent
27.	Yeast and Moulds	CFU/g	Absent	Absent	Absent	Absent	Absent	Absent	Absent	Absent

CFU=Colony forming unit, **Detection Limits**: (0.01; 0.001),
Source: Richflood Laboratory; November, 2022.

Physical Characteristics of Soil

The particle size distribution of the soil samples shows major percentage of sand in all the samples. The soil at the Project site has 87% sand and is of Loamy Sand texture. The soil at Cashew Farm, Fodacontea, Tambobo community, Tambouni Community, Kataba Fula Community and Tamaransi Community is of sandy loam texture. This can be attributed to weathering, breakdown, and fragmentation of rocks such as limestone, granite, and quartz. The soil sample from Kataba Community, shows more percentage of sand as compared to clay.

pH of Soil

The pH of soil samples from the project site, Cashew Farm, Kataba and Kataba Fula Communities were found to be slightly acidic. The soil sample from Fodacontea was moderately alkaline while the soil samples from Tambobo and Tamaransi communities were moderately acidic and soil sample at Tambouni Community was slightly alkaline.

Soil Minerals and Nutrients

Nitrate, Phosphorus and Potassium are the main nutrients that define soil fertility. Phosphorous content was observed to range from 0.284mg/kg to 0.665mg/kg across the sample area. The range of Nitrate content was from 1.10mg/kg to 8.60mg/kg while Potassium content range was from 0.001mg/kg to 0.690mg/kg.

Metals in the Soil

Potassium, Aluminium, Cobalt, Iron, Lead, Zinc, Manganese, and Calcium were detected in the soil samples. Among these metals, the content of Calcium, Lead and Cobalt were highest.

4.3.8 Air Quality

Air quality varies with the season due to the variations in temperature, humidity, and rainfall. During the dry season, dusts that are suspended in the near-ground air layers may cause frequent, but not significant, hazes which reduce visibility. However, during the wet season, rainfall removes dust from the atmosphere and improves the air quality. The dry season is characteristic of very dry and dusty conditions in the proposed project area.

Air Quality Standards (AQS)

Current air quality baseline conditions at the project area have been assessed on the basis of the comparison of monitored concentrations against the National and International Air Quality Standards (AQS). The standards have been described in the legislation chapter in Chapter 2. Table 4.10 below summarizes the Guinean standards and the IFC standards.

Table 4.10: Guinean and IFC/WHO air quality standards

Parameter	Averaging period	Guinean AQS ($\mu g/m^3$)	IFC/WHO AQS ($\mu g/m^3$)
SO_2	Calendar year	50	-
	24 h	125	125 (Interim target 1)
			50 (Interim target 2)
			20 (Guideline)
NO_2	Calendar year	40	40
	1 h	200	200
PM_{10}	Calendar year	80	70 (Interim target 1)
			50 (Interim target 2)
			30 (Interim target 3)
			20 (Guideline)
	24 h	260	150 (Interim target 1)
			100 (Interim target 2)
			75 (Interim target 3)
			50 (Guideline)
$PM_{2.5}$	Calendar year	65	35 (Interim target 1)
			25 (Interim target 2)
			15 (Interim target 3)
			10 (Guideline)
	24 h	-	75 (Interim target 1)
			50 (Interim target 2)
			37.5 (Interim target 3)
			25 (Guideline)
CO		-	-

Air Quality Monitoring

Richflood has undertaken an air quality monitoring survey in the proposed project area. The atmospheric pollutants monitored in relation to air quality were: Nitrogen Dioxide (NO_2), Sulphur Dioxide (SO_2), Suspended Particulate Matters ($SPM_{2.5\ \&\ 10}$), Hydrogen Sulphide (H_2S), Carbon Dioxide (CO_2), Carbon Monoxide (CO), Volatile Organic Compounds (VOCs), and Ozone (O_3).

- ***Particulate Matters (PMs)***

Particulate matters (PMs) are airborne particles that include dust, smoke, and soot. PMs can either be emitted naturally (e.g. windblown dust of loose soils) or through human activity (e.g. as a results of vehicular emissions). It is defined by size, with coarse particles being between 2.5-10 microns (PM_{10}), fine particles less than 2.5 microns ($PM_{2.5}$), and ultrafine particles less than 0.1 microns in aerodynamic diameter. Globally, PM_{10} and $PM_{2.5}$ have been identified as priority pollutants and they need to be monitored and managed where the source activity has the potential or is generating PM emissions.

- ***Sulphur Dioxide (SO_2)***

Sulphur Dioxide (SO_2) is a colourless gas and is characterised by a strong odour. It is a primary pollutant, which can react easily with other substances and form secondary pollutants such as sulphur trioxide and sulphuric acid, amongst others. SO_2 is formed by human activities through mainly industrial processes that contain sulphur.

- **Nitrogen Dioxide (NO_2)**

Nitrogen Dioxide (NO_2) is a naturally forming gas, characterised as having a strong odour. Small quantities can be produced by plants, soil, and water, but anthropogenic activities such as the combustion of fossil fuels and biomass are also seen as sources of NO_2 in the atmosphere.

- ***Carbon Dioxide (CO_2)***

Carbon Dioxide (CO_2) is the main product of fuel combustion in vehicle engines, along with water. CO_2 is the most significant greenhouse gas (GHG) influencing climate change, posing a threat to public health and the environment. Carbon Monoxide (CO) is released into the atmosphere as a results of an incomplete combustion, which occurs when the carbon in the fuel is only partially oxidised, forming CO and not CO_2. It is a colourless and odourless but a highly toxic gas. Direct

exposure to CO reduces the flow of oxygen in the bloodstream and is particularly dangerous to people with heart disease. Like Hydrocarbons (HCs), CO also contributes to the formation of ground-level ozone and smog.

- ***Hydrogen Sulphide (H_2S)***

Hydrogen Sulphide (H_2S) is a colourless, poisonous, corrosive and flammable gas, with trace amounts in ambient atmosphere having a characteristic foul odour of rotten eggs. It is most commonly formed due to the microbial breakdown of organic matter in the absence of oxygen.

- ***Ozone (O_3)***

Ozone (O_3) is a molecule made up of three oxygen atoms, often referenced as O_3. Ozone is formed when heat and sunlight cause chemical reactions between oxides of nitrogen (NO_X) and Volatile Organic Compounds (VOCs), which are also known as Hydrocarbons. This reaction can occur both near the ground and high in the atmosphere.

- ***Volatile organic compounds (VOCs)***

Volatile organic compounds (VOCs) are emitted as gases from certain solids or liquids. VOCs include a variety of chemicals, some of which may have short- and long-term adverse health effects. Concentrations of many VOCs are consistently higher indoors (up to ten times higher) than outdoors. VOCs are emitted by a wide array of products. VOCs are often components of petroleum fuels, hydraulic fluids, paint thinners, and dry cleaning agents. VOCs are common ground-water contaminants.

A total of Nine (9) monitoring stations were established within and around the project area. Three (3) monitoring stations (AQ_1 to AQ_3) are located within the proposed project boundary area while six (6) monitoring stations (AQ_4 to AQ_9) are located in the surrounding communities. There were no nearest sensitive receptors that could be affected by a Project-related degradation of ambient air quality.

The GPS coordinates as well as the descriptions of the monitoring stations are as shown in Table 4.11, while Table 4.12 presents the monitoring results as obtained during the survey.

Table 4.11: Air Quality and Noise sampling location

Code	Location Description	Coordinates		
		Latitude (N)	**Longitude (E)**	**Elev. (m)**
AQ_1	Project Location	10° 50' 7.8″	14º 21′ 23.8″	11
AQ_2	Project Location	10° 50' 2.0″	14º 21′ 25.2″	27
AQ_3	Project location Entrance	10° 50' 3.9″	14º 21′ 24.5″	13
AQ_4	Kataba Village	10° 50' 10″	14º 21′ 6.4″	66
AQ_5	Fodecontea Village	10° 49' 59.7″	14º 21′ 55.2″	21
AQ_6	Tambouni Village	10° 48' 59.6″	14º 22′ 44.1″	41
AQ_7	Tambobo Village	10° 50' 12.0″	14º 23′ 13.9″	22
AQ_8	Kataba Fula	10° 48' 47.8″	14º 20′ 2.3″	33
AQ_9	Tamaransi Village	10° 52' 29.0″	14º 18′ 38.6″	18

Source: *Richflood fieldsurvey, 2022*

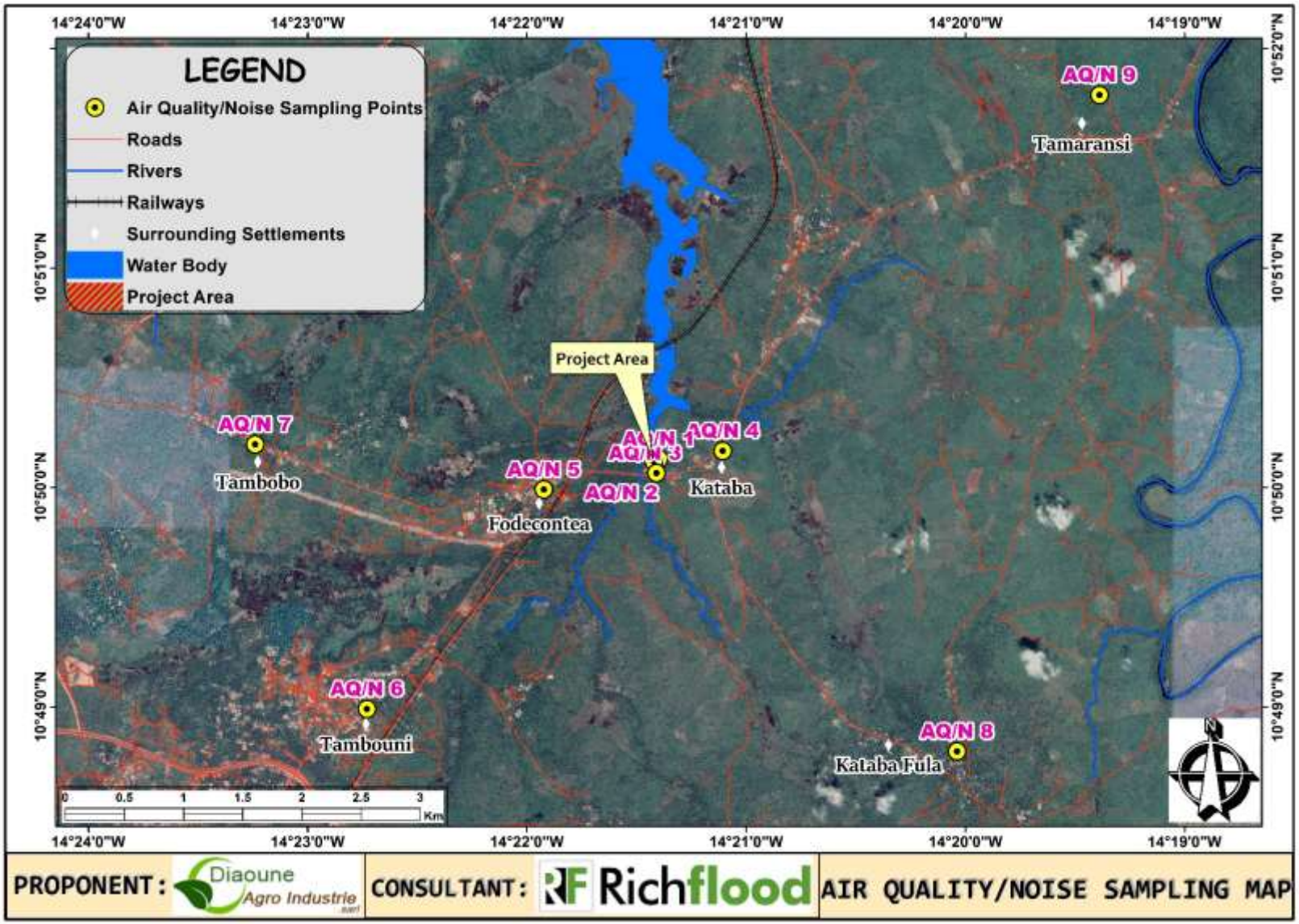


Figure 4.9: Air Quality and Noise Sampling Map
Source: Richflood, 2022

Table 4.12: Results of the Air Quality Monitoring

Sample Points	Sample Location	O_3 (µg/m^3)	CO (µg/m^3)	SO_2 (µg/m^3)	NO_2 (µg/m^3)	H_2S (µg/m^3)	CO_2 (µg/m^3)	VOCs (µg/m^3)	SPM (µg/m^3)		Illumination (lx)
									$PM_{2.5}$	PM_{10}	
AQ_1	Project Location	14.00	0.00	0.00	100.00	0.00	585000	3820.00	0.00	0.00	5550.00
AQ_2	Project Location	12.00	0.00	0.00	5.00	0.00	511000	1510.00	0.00	0.00	5659.00
AQ_3	Entrance	9.00	1360.00	0.00	0.00	110.00	517000	1020.00	0.00	0.00	5664.00
AQ_4	Kataba Village	11.00	0.00	0.00	38.00	10.00	477000	1120.00	0.00	0.00	5613.00
AQ_5	Fadecontea Village	0.00	0.00	0.00	2.40	0.00	485000	2550.00	0.00	0.00	5528.00
AQ_6	Tambouni Village	11.00	0.00	0.00	11.00	0.00	506000	1660.00	0.00	0.00	5692.00
AQ_7	Tambobo Village	6.00	420.00	0.00	0.00	10.00	466000	1350.00	0.00	0.00	5510.00
AQ_8	Kataba Fula	3.00	10.00	0.00	6.00	0.00	512000	1650.00	0.00	0.00	5670.00
AQ_9	Tamaransi Village	5.00	0.00	0.00	82.00	70.00	496000	1920.00	0.003	0.006	5660.00
Guinean AQS				**50**	**40**					**260**	
IFC/WHO AQS		**100**		**20**	**200**			**-**	**25**	**50**	

Source: Richflood, 2022.

4.3.9 Noise

Noise standards

Table 4.13 summarizes the Guinean and IFC HSE guidelines to community ambient noise levels. These prescribe an absolute level of 55 dB(A) during the daytime and 45 dB(A) during night time value in residential areas. These values make reference to noise from facilities and stationary noise sources, and are commonly applied as design standards for industrial facilities; IFC has indicated that these limits are not directly applicable to transport or mobile noise sources.

In environments where the ambient noise levels already exceed a level of 55 dB(A) daytime and/or 45 dB(A) night time the International Finance Corporation (IFC) includes a guideline stating that noise emissions should not cause the ambient noise level in a residential area to rise by 3 dB(A) or more, determined during the noisiest hour of a 24-hour period.

Table 4.13: Ambient noise levels: proposed Guinean standards and IFC guidelines

Period	Maximum Ambient Noise Level 1-hour Leq [dB(A)]				
	Guinean standards			IFC Guidelines	
	Class 1 Residential area	Class 2 Commercial area	Class 3 Industrial area	Residential Institutional, Educational	Industrial, Commercial
6:00 – 13:00	50	55	70	55	70
13:00 – 15:00	45	50			
15:00 – 22:00	50	55			
22:00 - 6:00	45	50		45	

Table 4.14: Results of the Noise Monitoring

Sample Points	Sample Location	Average Noise [dB (A)]
AQ_1	Project Location	53.60
AQ_2	Project Location	51.80

Sample Points	Sample Location	Average Noise [dB (A)]
AQ_3	Entrance	49.50
AQ_4	Kataba Village	53.60
AQ_5	Fodecontea Village	53.90
AQ_6	Tambouni Village	54.90
AQ_7	Tambobo Village	48.80
AQ_8	Kataba Fula	53.20
AQ_9	Tamaransi Village	51.80
Guinean Noise Limits		**50**
IFC Noise Limits		**55**

Source: Richflood Fieldsurvey, 2022

It could be observed that the existing baseline noise levels at all monitoring stations are within the IFC Noise Limits for day time. However, the noise levels at some of the locations are higher than the Guinean Noise Limits. Such locations include: Within the Project location (AQ_1 and AQ_2), Kataba Village (AQ_4), Fodecontea Village (AQ_5), Tambouni Village (AQ_6), Kataba Fula (AQ_8), Tamaransi Village (AQ_9).

4.3.10 Land Use

The surrounding environment has undergone significant transformation due to large-scale cash crop plantation which includes cashew and oil palm plantation, rural subsistent agriculture and harvesting of surrounding trees for fuelwood and building materials. The existing vegetation consists largely of secondary tropical forest and agricultural plantation mainly cash crop such as palm and cashew with mosaic of natural vegetation especially along the fringes of the several fresh water stream distribution in the area.

The Current land uses within the surrounding area are dominated by agricultural uses, mostly consisting of cash crop plantations and subsistence crop cultivation. Villages are present within

the surrounding areas and are associated with the surrounding agricultural plantations and farmlands (Plate 4.1 and Plate 4.2).

Plate 4.1: Palm plantation within the project AoI
Source: *Richflood, 2022*

Plate 4.2: Cashew Plantation within the Project AoI
Source: *Richflood, 2022*

4.3.11 Land Use/Land Cover

Land use/cover inventories are an essential component in land resource evaluation and environmental studies due to the changing nature of land use patterns especially because of the nature of the project's AOI. The land use study for the proposed processing plant and its 1 km buffer was undertaken.

Landsat Operational Land Imager (OLI) 8 (Path 203 and Row 053) of the area was acquired from the United States Geological Survey's (USGS) Earthexplorer. The choice of Landsat imageries for this study was guided by the fact that the products are free and of open access status. According to Wulder *et al*. (2012), the free and open access status of Landsat encourages users from countries of diverse economic status to benefit from the resources. Landsat is also one of the few accessible remote sensing products that have remotely obtained imagery for a relatively long time since 1972 and is useable for the Guinean environment (Cohen and Goward 2004).

Bands 3, 4 and 5 of the Landsat 8 OLI imageries were used for the LULC analysis. The imageries were processed in TerrSet (formally IDRISI) software, an integrated geographical information system (GIS) developed by Clark Labs at Clark University, Worcester MA, United States of America for analysis and display of geospatial information (Eastman 2003). IDRISI GIS is generally described as 'an extremely low-priced', raster-based GIS that is able to provide the range of functions for remote sensing analysis and GIS (Meaden and Kapetsky, 1991).

Unsupervised Classification was performed on the imageries using Isoclust Algorithm. The area was classified into four (4) classes namely: Natural and Modified, Transformed, Riprarian Forests and Freshwater (Figure 4.10) using the Anderson Classification scheme. After the classification, it was observed that Natural and Modified cover about 28%, Transformed covers about 15%, Riparian Forests cover about 32%, and about 25% of the 1 km buffer of the project AOI is covered by Freshwater.

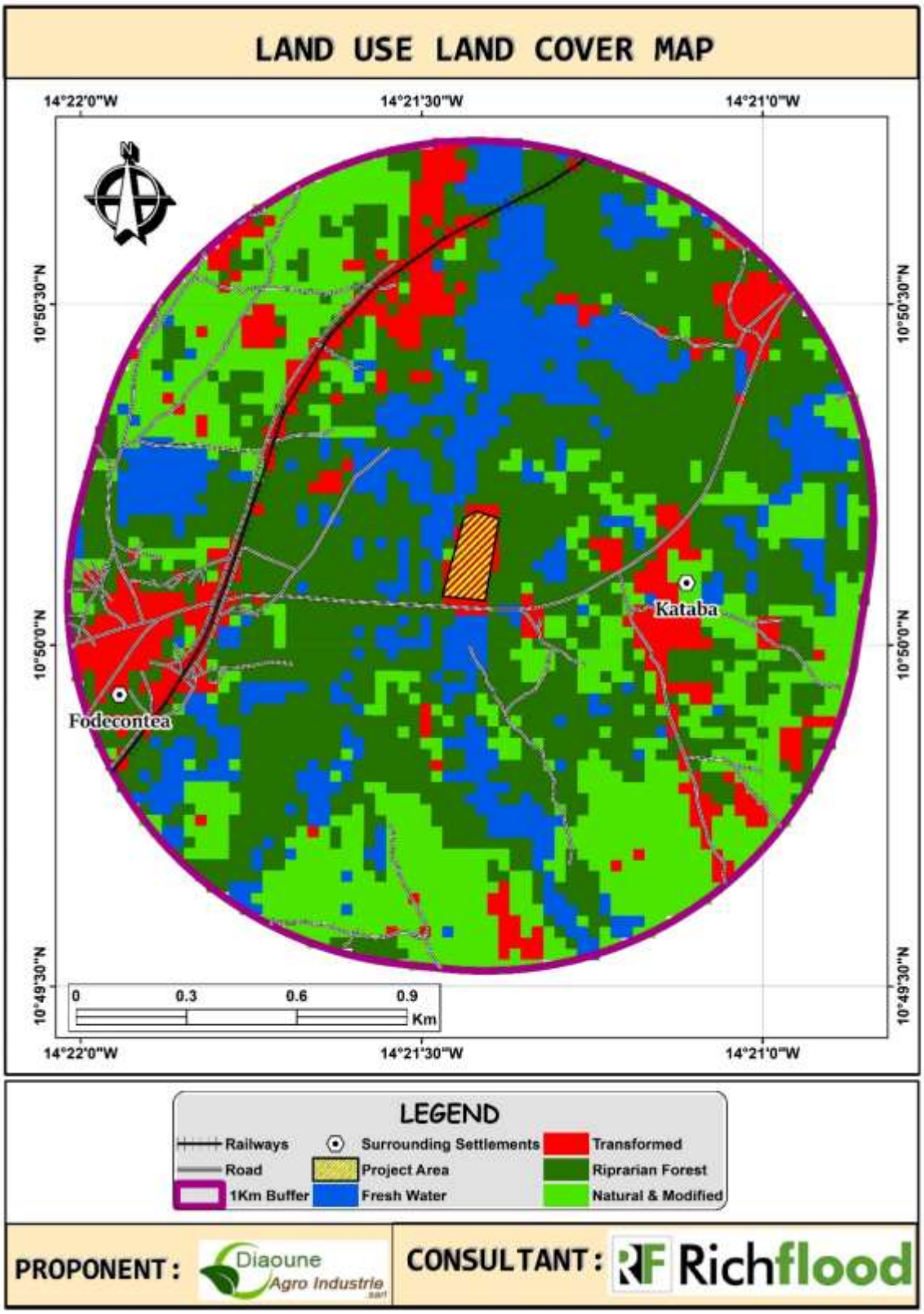


Figure 410: Land Use Land Cover Map of the Project Area
Source: Richflood, 2022

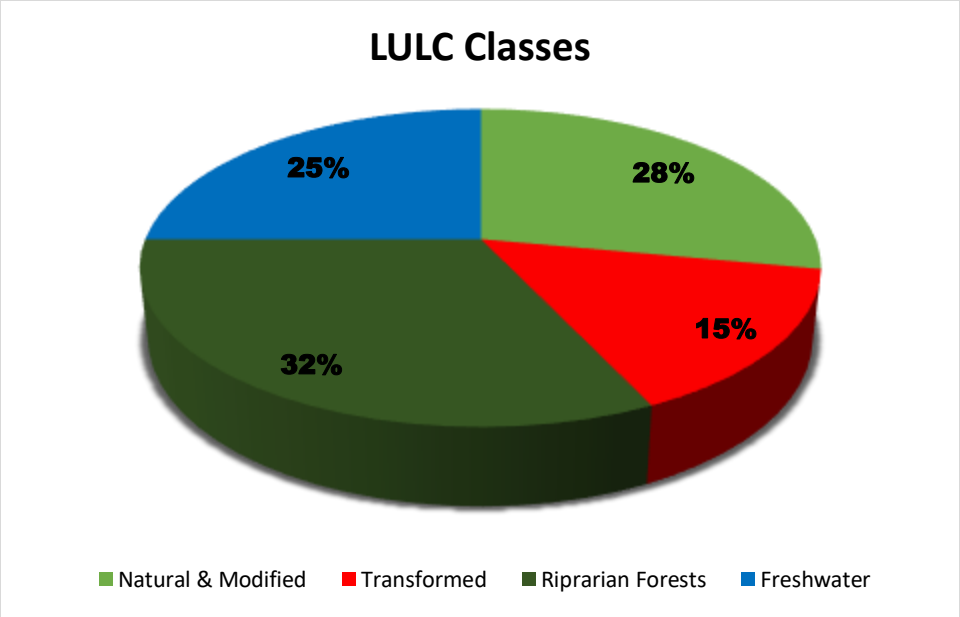


Figure 4.11: Chart showing the Land Use Land Cover Classes
Source: Richflood, 2022

Table 4.15: Percentage of Land Use and Land Cover Classes of the Project area

Land Use/Land Cover Classes	Percentage (%)
Natural & Modified	28
Transformed	15
Riprarian Forests	32
Freshwater	25

Source: Richflood, 2022

4.4 Ecological Resources

A site visit was undertaken to the project area and field survey of the area was carried out in other to provide information on the baseline ecological resources and conditions within the project area. Detailed result and information from the site visit survey is as provided in Appendix A.

The main project area falls within the lowland tropical rainforest ecoregion of Guinea, which is characterized by evergreen broadleaf trees, with patches and undergrowth mixture of shrubs, herbs and grasses. The ecoregion within the project area also extends south-west into the low-lying

coastline mangrove forest which is dissected by estuaries and swamps. In a broader perspective, the ecoregion is considered as a Guinea savannah forest mosaic, characterised by plateau covered with scattered wooded savannah, grasslands, rare patches of dry forests, interspersed by remnants of gallery forests along the water courses (TBC, 2021). Several fresh water streams of variable sizes traverse the vegetation within the project area, flowing towards the coastal area. The streams are bordered by gallery forest which provides watershed conditions within the area. Generally, while the project area is heavily used for plantation agriculture and subsistent farming, the area still maintains a good level of ecosystem functionality.

The vegetation unit is predominantly made up of broadleaf secondary forest tall trees, spread across the landscape and forming gallery forest along the edge of the various flowing streams, as well as stands of plantation (cashew and oil palm), grasses and shrubs. The forest structure consists of tall canopy tree species reaching different heights and stratified at different layers. The crowns of the resident species grow to different heights, with the uppermost storey consisting of trees reaching 50m in height, trees of 20-30m forming second storey, while the lower and densest layer includes trees of 5 to 20m (Robert, 1983).

The Fouta Djallon mountain range which forms a broad overlap with the ecoregion of the area presents a noticeable level of endemism, especially for small-bodied herpetofauna and freshwater species. This part of Guinea is also one of the last strongholds of Western Chimpanzees (*Pan troglodytes verus*) in West Africa as noted by the IUCN SSC Primate Specialist Group (TBC, 2021).

Considering that the littoral zone within the project area remains relatively sparsely populated and undeveloped, the vegetation units have not been greatly threatened (EEM, 2015).

However, the activities of mining within Sangarédi and Kamsar about 70km northeast and 45km southwest of Boke has had a significant impact on natural ecosystems, both in coastal areas around Rio Nuñez estuary and Sangarédi plateau area. Areas of higher ecological value in the southern ecoregion around Kamsar city includes the Rio Kapatchez and Îles Tristao Ramsar sites Important Bird Area (IBAs) and the Île Alcatraz and Île du Naufrage marine IBAs (TBC, 2021).

4.4.1 Habitats

Five habitat types were delineated for the project footprint area and the associated AoI. These habitats are shown in Figure 4.12 and are briefly discussed below.

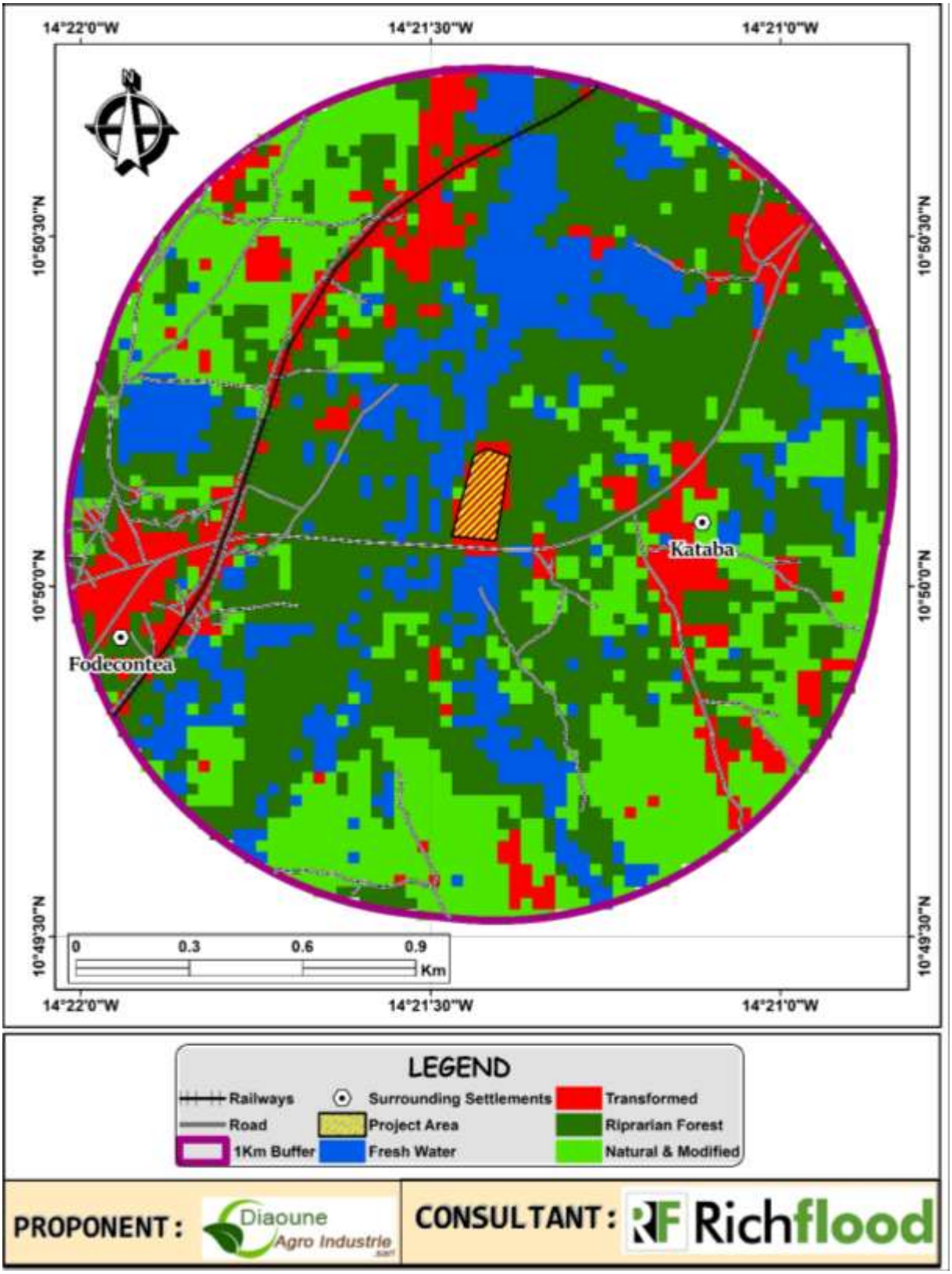


Figure 4.12: Land cover and Habitat delineated for the project area
Source: Richflood, 2022

Riparian Forest

The riparian habitat constitutes the low lying gallery forest along the several flowing streams traversing the project AoI. Riparian habitat was observed within the west section and the edge of the project foot print. The presence of river Rio Nuñez, north-west of the project greatly influences ecosystem dynamics of the project area with the network of streams draining the project area and providing riparian habitat conditions. The river Rio Nuñez splits south of the project AoI, with it tributaries flowing south towards the coastal area. At low-lying areas, the stream provides wetland conditions for rice farming which is a major subsistent agricultural activity in the area.

The Riparian forest plays crucial roles as habitat and movement corridor for several faunal species especially birds, small species of reptiles and amphibians which are known or believed to occur within the project AoI, and dependent on the riparian forest and fresh water ecosystem. Downstream, the habitat also serves as water resource for the local community.

This habitat unit can be regarded as highly important, not only within the local landscape, but also regionally. The habitat sensitivity is considered moderate. Limited direct impacts are predicted on the riparian habitats from the project activities to be undertaken by DAI. No IUCN Red-listed species were recorded within this habitat unit.

Agricultural Plantation

Agricultural plantations within the project AoI majorly consist of Cashew and stands of Palm oil which constitute the predominate cash crop cultivated by local residents in the area. Plantations were found at various different clusters around the villages where farmers reside and serve as one of the major source of livelihood in the area. The agricultural plantation is derived from the transformation of Natural habitat and is considered to supports low biodiversity compared to the natural habitats. Despite supporting low biodiversity, the agricultural plantation habitat form a unique habitat within the region, playing an important role within the faunal species makeup by providing refugia and food for faunal species especially birds and lower invertebrates. The habitat sensitivity is considered low. Direct impacts from the project are predicted on this habitat condition, with increased demand for cashew translating to associated expansion in cashew plantation and loss of natural habitat. The habitat is highly modified and No SCC specie was recorded within this habitat unit.

Plate 4.3a: Agricultural plantation (Palm plantation observed) in the area
Source: *Richflood, 2022*

Plate 4.3b: Agricultural plantation (Cashew farm) observed in the area
Source: *Richflood, 2022*

Fresh water

The presence of the river Rio Nuñez in the project AoI is associated with perennial streams of freshwater traversing the project AoI. Network of streams were found in low lying areas which drains the area. The freshwater habitat plays a crucial role in the ecosystem functionality of the area and accounts for the presence of freshwater-dependent species, especially fish species as well as aquatic flora and fauna species.

Limited direct impacts are foreseen on freshwater habitats due to the activities to undertaken as part of the project. The main potential impact from the project activities stems from erosion induced water run-off and increased turbidity/sedimentation on water streams. No SCC was recorded within this habitat.

Plate 4.4: The freshwater stream observed at the edge of the project footprint

Source: *Richflood, 2022*

Transformed

This habitat is characterised by areas cleared of natural vegetation mainly for housing and infrastructure as well as some of the roads and railway lines within the project AoI. The project footprint where the project will be situated is also classified as transformed habitat. Vegetation structure consists of short shrub and grass land including some non-native crops and weeds. No IUCN Red-listed Data species were recorded within this habitat unit. This habitat is assigned a low sensitivity.

Plate 4.5: Transformed habitat along Railway as observed within the project area

Source: *Richflood, 2022*

Natural and Modified Habitats

This habitat is a mosaic of Natural and Modified forest within the project AoI. The habitat consists mostly of primary dense forest and modified woodland forest transformed from loss of primary forest. In between these areas, some patches of modified shrub, grassland, fallow land (arable land used for rotational crop cultivation and cash crop plantation) in various states of utilisation and recovery were found. The mosaic Natural and Modified habitats has undergone variable level of anthropogenic pressure including charcoal production, bush fires, use of timber associated with the local community. The vegetation found here consists of tall woodland trees and shrubs as well as grasses and herbaceous species that are known to grow in more disturbed areas. There are large areas of lowland forest in Guinée Forestière (Forest Guinea) with most of these forests are highly fragmented (Couch *et al*., 2019).

No species of conservation concern was recorded within this habitat during the baseline survey for the project. Terrestrial mosaics of Natural and Modified Habitats are considered a priority biodiversity feature of stakeholder concern and therefore a NNL target is required (TBC, 2015).

The DAI project site has undergone varying degree of anthropogenic pressure which has modified its intrinsic value and the project is not expected to have direct impacts on terrestrial habitats.

Plate 4.6: Mosaic Natural and Modified Habitats

Source: *Richflood, 2022*

4.4.2 Habitat Sensitivity

Habitats provide ecosystem services in the form of food and aesthetic value. The riparian forest and fresh water streams within the project area are rated as moderately sensitive. The habitat has already been modified by impacts such as replacement for palm plantation agriculture. The extent of the habitat that will be altered as a result of the project can thus not be regarded as extensive.

Areas that are classed as sensitive are generally those which are considered to be in a natural condition or were found to contain (or provide habitat for) threatened faunal or floral species. The following classifications are used to describe the possible sensitivity rankings:

- Low – insignificant amounts of natural habitat or vegetation present. Existing habitat has been extensively transformed. Remaining vegetation dominated by alien invasive plant species;
- Low-Moderate – existing habitats have been heavily transformed and little natural vegetation or habitats are present. Species diversity is considered low. Area may be considered otherwise moderately important (such as a movement corridor for fauna);
- Moderate – existing habitats have been modified or transformed but an equal percentage of natural vegetation and habitats remain. Species diversity is considered moderate. Such habitat is considered to have a strong chance of successful rehabilitation if left to restore through natural succession processes;
- Moderate-High – the majority of area is considered to be in a near-natural state. Species diversity is high, and the ecosystem function is healthy. Minor impacts may be present; and
- High – the area is considered to be in a largely natural condition with high levels of species diversity and also a good probability of Critical Habitat classification. Alternatively, an area may be regarded as having a high sensitivity (even if the habitat is modified) but is found to be habitat, or a breeding area, for any Species of Conservation Concern.

Each habitat unit was assessed and assigned a habitat sensitivity rating.

4.4.3 Flora

A total of 37 plant species were observed during field survey and are provided in Table 4.16. Plants were recorded across 19 families, with Fabaceae having the highest proportion of species. All of the species have at least one known secondary ecosystem service that it provides to the local community. The three main categories of ecosystem services are medicine, food source or commodity (e.g. thatch or wood).

All the species recorded were non endemic and none were Species of Conservation Concern (SCC), this speaks to the modified nature of the habitat in the project area. Critical habitat

assessment for flora as per IFC Performance Standard 6 found no critical habitats to be present within the project area.

Table 4.16: Flora species recorded in the proposed project area

Scientific Name	Common Name	Family	IUCN Status	Endemic Status	Growth Form	Uses
Parkia Biglobosa	African Locust Beans	Fabaceae	LC	Non-Endemic	Tree	Consumed as Food
Anthocleista Djalonensis	Cabbage Tree	Gentianaceae	LC	Non-Endemic	Shrub	Used as medicine
Ageratum Conyzoides	Goatweed	Asteraceae	LC	Non-Endemic	Herb	Treatment of antimicrobe, arthrosis and headache
Tamarindus Indica	Tamarind	Caesalpiniodeae	LC	Non-Endemic	Tree	Medical purpose, ingredient for local drink
Chromolaena Odorata	Chromolaena	Asteraceae	LC	Non-Endemic	Herb	Medicinal purpose
Ceiba Pentandra	Silk Cotton Tree	Bombacaceae	LC	Non-Endemic		For food and construction
Bambusa Vulgaris	Common Bamboo	Poaceae	LC	Non-Endemic	Grass	For construction
Piliostigma Thonningii	Cattle Foot	Fabaceae	NA	Non-Endemic	Tree	Medicinal purpose
Elaeis Guineensis	Oil Palm	Arecaceae	LC	Non-Endemic	Tree	Consumed as Food
Milicia Excelsa	African Teak	Moraceae	NT	Non-Endemic	Tree	Construction purpose
Xylopia Aethiopica	Custard Apples	Annonaceae	LC	Non-Endemic	Tree	For consumption
Albizia Adianthifolia	Flat-Crown	Fabaceae	LC	Non-Endemic	Tree	Medical purpose
Combretum Grandiflorum	Bushwillow	Combretaceae	LC	Non-Endemic	Shrub	Making dyes
Uapaca Heudelotii		Euphorbiaceae	LC	Non-Endemic	Tree	Medicinal purpose
Terminalia Catappa	Tropical Almond	Combretaceae	LC	Non-Endemic	Tree	For food consumption
Allophylus Africanus	African Allophylus	Sapindaceae	LC	Non-Endemic	Shrub	Consumed as food
Annona Senegalensis	Wild Soursop	Annonaceae	LC	Non-Endemic	Shrub	Consumed as food
Holarrhena Floribunda	False Rubber Tree	Apocynaceae	LC	Non-Endemic	Tree	Medicinal purpose
Pennisetum Purpureum	Elephant Grass	Poaceae	LC	Non-Endemic	Herb	Consumed as food
Andropogon Tectorum	Beard Grass	Poaceae	LC	Non-Endemic	Herb	For furniture
Cantinoa Americana	Black Sesame	Lamiaceae	LC	Non-Endemic	Herb	Medicinal purpose
Dioscorea Hirtiflora	Wild yam	Dioscoreaceae	LC	Non-Endemic	Climber	Consumed as food
Rungia Eriostachya	-	Acanthaceae	NT	Non-Endemic	Herb	Medicinal purpose
Albizia Ferruginea	False thorn albizia	Fabaceae	NT	Non-Endemic	Tree	Medicinal purpose
Dichrostachys Cinerea	Sicklebush	Fabaceae	LC	Non-Endemic	Tree	Medicinal purpose

Lophira Lanceolata	Dwarf Red Ironwood	Ochnaceae	LC	Non-Endemic	Tree	for construction purpose
Daniellia Oliveri	African Copaiba Balsam Tree	Fabaceae	LC	Non-Endemic	Tree	Medicinal purpose
Dialium Guineense	Black Velvet Tamarind	Leguminosae	LC	Non-Endemic	Tree	Medicinal purpose
Newbouldia Laevis	Boundary Tree	Bignoniaceae	LC	Non-Endemic	Tree	For food and construction purpose
Holarrhena Floribunda	False Rubber Tree	Apocynaceae.	LC	Non-Endemic	Tree	Medicinal purpose
Diospyros Heudelotii	-	Ebenaceae	LC	Non-Endemic	Tree	Food, medicine, and wood for construction
Anisophyllea Laurina	Monkey Apple	Anisophylleaceae	LC	Non-Endemic	Tree	Medicinal purpose
Rutidea Parviflora	-	Rubiaceae	LC	Non-Endemic	Shrub	Medicinal purpose
Bombax Costatum	Red-Flowered Silk Cotton Tree	Malvaceae	LC	Non-Endemic	Tree	Medicinal purpose
Dilophotriche Occidentalis	-	Poaceae	LC	Non-Endemic	Grass	Consumed as food
Utricularia Rigida	Bladderworts	Lentibulariaceae	LC	Non-Endemic	Herb	Medicinal purpose
Ficus Platyphylla	Broadleaf fig	Moraceae	LC	Non-Endemic	Tree	Consumed as food

Source: Richflood, 2022

4.4.4 Mammals

As a large portion of the project area is covered with agricultural plantation and modified vegetation, rodent species were predominant mammal species occurring in the area. During field observations three mammal species; Giant Rat (*Cricetomys gambianus*), Grasscutter (*Thryonomys swinderianus*) and Tree Squirrel (*Xerus erythropus*) were observed in the project area. This is likely due to the disturbed nature of the area, along with the high human anthropogenic activities likely resulting in loss of their habitat and utilised as a food source. Critical habitat assessment for mammals found no critical habitats to be present within the project area.

4.4.5 Avifauna

A total of 41 species were observed during the field assessment and are listed in Table 4.17. Most of the species are regarded as generalist common species that are well adapted to human disturbance across the different habitats. None of the species recorded are of conservation concern.

During the assessment, it was discovered that the modified secondary forest still harboured a rich species of avifauna. Also, the fresh water stream habitat is regarded as important habitat for avifauna, but based on these criteria, no critical habitat was identified for the avifauna component of the project.

Table 4.17: Avifaunal species recorded in the project area during the field assessment

Scientific Name	Common Name	IUCN Status	Endemic Status
Polyboroides typus	African Harrier Hawk	LC	Not endemic
Lophoceros semifasciatus	African Pied Hornbill	LC	Not endemic
Cinnyris venustus	Variable Sunbird	LC	Not endemic
Vidua chalybeata	Village Indigobird	LC	Not endemic
Crithagra mozambica	Yellow-fronted Canary	LC	Not endemic
Euplectes ardens	Red-collard Widowbird	LC	Not endemic
Lagonosticta rubricata	African Firefinch	LC	Not endemic
Chrysococcyx klaas	Klaas's Cuckoo	LC	Not endemic
Illadopsis fulvescens	Brown Illadopsis	LC	Not endemic
Gypohierax angolensis	Palm-nut vulture	LC	Not endemic
Chrysococcyx caprius	Diederik Cuckoo	LC	Not endemic
Cyanomitra olivacea	Olive Sunbird	LC	Not endemic
Platysteira cyanea	Brown-throated Wattle-eye	LC	Not endemic
Streptopelia semitorquata	Red-eyed Dove	LC	Not endemic

Scientific Name	Common Name	IUCN Status	Endemic Status
Streptopelia vinacea	Vinaceous Dove	LC	Not endemic
Ploceus cucllatus	Village Weaver	LC	Not endemic
Pogoniulus bilineatus	Yellow-rumped Tinkerbird	LC	Not endemic
Pogoniulus chrysoconus	Yellow-fronted Tinkerbird	LC	Not endemic
Corvus albus	Pied Crow	LC	Not endemic
Camaroptera brevicaudata	Grey-backed Camaroptera	LC	Not endemic
Pycnonotus barbatus	Common Bulbul	LC	Not endemic
Numenius arquata	Eurasian Curlew	NT	Not endemic
Tringa totanus	Senegal Coucal	LC	Not endemic
Prinia subflava	Tawny-flanked Prinia	LC	Not endemic
Terpsiphone rufiventer	Red-billed Paradise Flycatcher	LC	Not endemic
Passer griseus	Northern Grey-headed Sparrow	LC	Not endemic
Cypsiurus parvus	African Palm Swift	LC	Not endemic
Butorides striata	Green-backed Heron	LC	Not endemic
Kaupifalco monogrammicus	Lizard Buzzard	LC	Not endemic
Accipiter tachiro	African Goshawk	LC	Not endemic
Pternistis bicalcaratus	Double-spurred Francolin	LC	Not endemic
Actophilornis africanus	African Jacana	LC	Not endemic
Turtur afer	Blue-spotted Wood Dove	LC	Not endemic
Chrysococcyx cupreus	African Emerald Cuckoo	LC	Not endemic
Halcyon malimbica	Blue-breasted Kingfisher	LC	Not endemic
Eurystomus gularis	Blue-throated Roller	LC	Not endemic
Bycanistes sharpii	Piping Hornbill	LC	Not endemic
Nicator chloris	Western Nicator	LC	Not endemic
Spermestes cucullata	Bronze Mannikin	LC	Not endemic
Vidua macroura	Pin-tailed Whydah	LC	Not endemic
Lagonosticta senegala	Red-billed Firefinch	LC	Not endemic

Source: Richflood, 2022

4.4.6 Herpetofauna

During field observations relatively few species of herpetofauna were recorded within the project area as the list recorded during the survey period is as presented in Table 4.18. The species recorded comprised of three reptiles and two amphibian species. The relatively low richness of herpetofauna was likely due to the synergistic effect of habitat degradation due to anthropogenic activities. Furthermore, no herpetofauna species of global conservation concern were recorded, and none of the species recorded are regarded as endemics. Critical habitat assessment for herpetofauna found no critical habitats to be present within the project area.

Table 4.18: Herpetofauna species recorded in the project area during the field assessment

Scientific Name	Common Name	IUCN Status	Endemic Status
Reptile			
Agama agama	Common Agama	LC	Non-endemic
Hemidactylus angulatus	House Gecko	LC	Non-endemic
Varanus niloticus	Nile Monitor	LC	Non-endemic
Amphibians			
Hyperolius spatzi	African reed frog	LC	Non-Endemic
Leptopelis viridis	Rusty Forest Tree frog	LC	Non-Endemic

Source: *Richflood, 2022*

4.4.7 Ecosystem Services

The project AoI is low-lying, cut by tributaries of river Rio Nunez providing an ideal environment for riparian forests. Because project AoI remains relatively sparsely populated and undeveloped, except in the vicinity of Boke town, the vegetation has not been greatly threatened. The Guinean coastal mangrove ecosystems, therefore, continue to provide a habitat for marine wildlife and a host of social and economic benefits to the resident population.

Some of the obvious uses of forest species which includes firewood, timber and charcoal clearly have been recognized and incorporated into local lifestyle among villagers. Other, less apparent products (foods, oils, medicines) play major roles in traditional usage amongst local people.

4.4.8 Current impacts to ecological resources

Based on field observations, it is evident that ecological resources in the project area are currently impacted by a range of factors. Figure 4.13 illustrates a number of these factors which include:

- Presence of alien invasive plant species;
- Roads and railway lines;
- Agricultural Plantation;
- Production of charcoal;
- Cutting of trees (vegetation removal); and
- Developments, farmsteads and houses.

Plate 4.7: Ecological Impacts observed: Wood burning to produce Charcoal

Source: *Richflood, 2022*

4.5 Socio-economic Conditions

The Project site is located in Kataba within the Boké commune, Boke prefecture in Boké region, Guinea. The site is located at the outskirt of Boké town, which is about 14.3km away, along Boke-Kalaboui Road. Boke prefecture is one of the 5 prefectures in Boke region, and covers an area of 11,124Km^2. According to the 2014 National census, the population of Boke prefecture is estimated at 450,278 people (Institut National de la Statistique de Guinée).

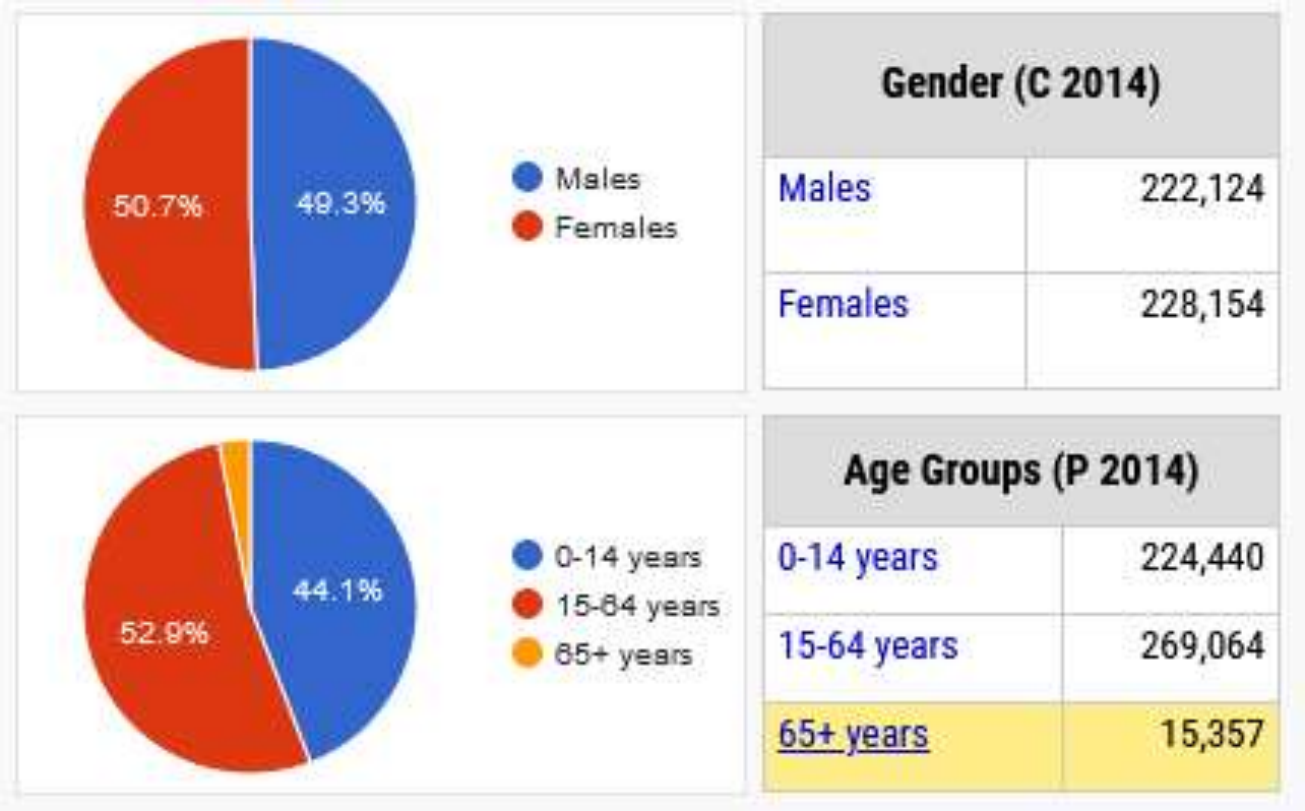


Figure 4.13: Population Composition of Boke region

Source: citypopulation.de

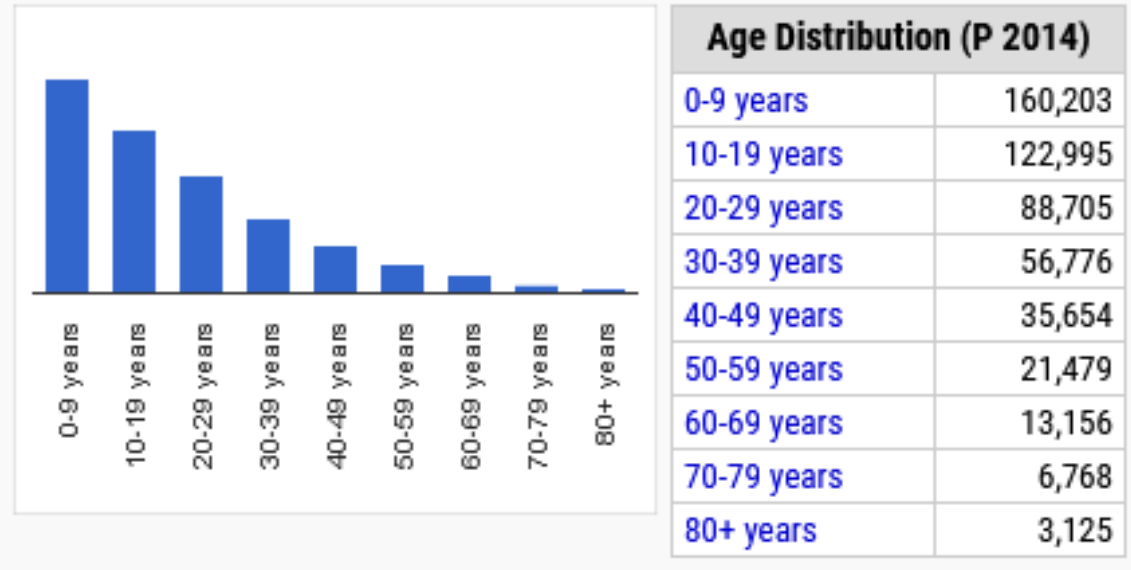
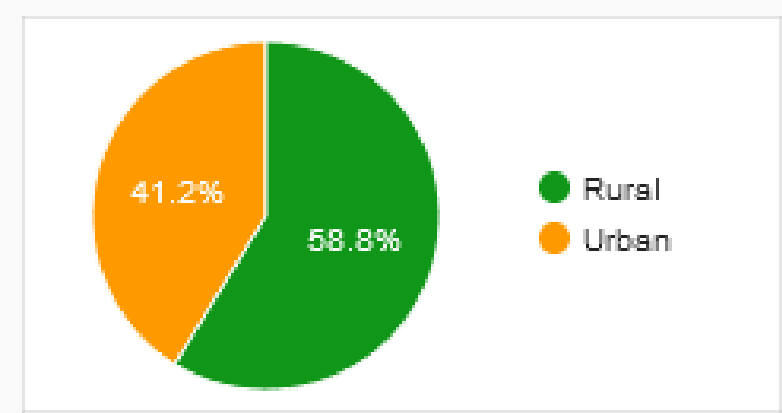


Figure 4.14: Age Distribution of Boke region

Source: citypopulation.de

Majority of Guinea's population is rural, and more than 70% of the population works in the agriculture, livestock, fishery, forestry, and mining sectors. Farms are family-owned and -operated, and generally small: two-thirds are less than three hectares. Pastoralists move large herds seasonally between the hinterland and the coast, negotiating with the settled farming communities for access to dry-season grazing and saltlicks in the grasslands and coastal plains (USAID, 2010).



Urbanization (C 2014)	
Rural	264,730
Urban	185,548

Figure 4.15: Percentage of Rural to Urban areas in Boke region

Source: citypopulation.de

Religion in Guinea is approximately 89 percent Muslim, 7 percent Christian, with 2 percent adhering to indigenous religious beliefs. There are also smaller numbers of Atheists and practitioners of other religions in the country. Much of the population, both Muslim and Christian, also incorporate indigenous African beliefs into their outlook (WorldFactbook, 2022).

Primary health care facilities within the Boke metropolis offer basic care and are mainly preventative in nature with emphasis on mother and child and include. Approximately 85% of health care facilities are government-run facilities with 15% privately run facilities. The most prevalent disease is malaria and other common diseases include typhoid, cholera and diarrhoea (Wikipedia, 2022).

4.5.1 Administrative Divisions and Institutions

A. Devolved Power

❖ ***Prefecture***

The administrative head of a prefecture is the Prefect. The prefect is appointed by a decree of the President of the Republic from public servants belonging to levels A and B of the civil service and senior officers from the army, the gendarmerie and the police. He must reside in the capital of the prefecture. Under Decree 081/PRG/SGG/87, he is a representative of the President of the Republic and of each member of the government: in that capacity, he is responsible for enforcing laws, regulations and government decisions, as well as for ensuring public order in the prefecture.

According to the decree, the prefect assists the populations with decentralization, namely the constitution of their decentralized communities. Moreover, the prefect oversees all the entities in the subprefecture, whether they are subject to deconcentration or decentralization, namely the rural communes (formerly rural development communes) and the urban communes as well as the rural districts and the urban quarters that they consist of, respectively.

The prefect is assisted by two general secretaries of the prefecture; the one is responsible for decentralized communities and the other for administrative matters. Thus theoretically the prefecture supports decentralization structures through the appointment of a secretary responsible for decentralized communities. The two general secretaries are appointed by a decree of the President of the Republic from public servants belonging to levels A and B (Swartz, 1980).

❖ ***Subprefecture***

The administrative head of a subprefecture is the Subprefect. The subprefect is appointed by an order of the Minister of Territorial Administration and Decentralization from public servants belonging to levels B and C and officers and non-commissioned officers of the army, the gendarmerie and the police. This appointment by the Minister is the result of the reorganization of the ministries by the Government of President Alpha Condé in January 2011. Under Decree 081/PRG/SGG/87, the subprefect must reside in the capital of the subprefecture.

The subprefect is assisted by an assistant subprefect, who is also a public servant. The assistant subprefect is appointed by an order of the Minister of the Interior and Decentralization on the same

conditions as the subprefect. Like the prefecture, the subprefecture rarely plays a role on the district level. Even so, it may play a role in conflict management.

Moreover, the subprefecture is often closer to the authorities on the micro-local level (district or sector) and it is therefore better equipped than the prefecture to manage conflicts, including those between herders and farmers. In addition, it should be noted that there is no equivalent of the subprefectoral level for urban communes. Boké urban commune therefore depends directly on the prefecture on the administrative level (Swartz, 1980).

B. Decentralized Power

❖ ***Rural Communes and Urban Communes***

Administrative decentralization began in the Republic of Guinea on December 22, 1985 (Condé, 2003) with the creation of a Secrétariat d'État responsible for decentralization, but rural development communes did not become widespread until early in the 1990s. Since 2011, the rural development communes have become rural communes (CRs), even though the legislation governing them has not really changed.

The rural communes and the urban communes are decentralization entities of the State and are independent in terms of their budgetary management and development decisions. The boundaries of the CRs are most often based on those of the subprefecture. The Local Governments Code, which sets out the organization and responsibilities of the decentralization bodies, was revised by the Ministère de la Décentralisation in 2008.

Even though the draft decrees accompanying it could not be ratified by the Assemblée Législative as a result of various political events that followed its development, the revised Local Governments Code is the reference currently used by Guinea's decentralization bodies. The Community Council manages various matters by deliberation on the level of the CR. It establishes the development program for the entire CR with funds from the community (obtained from taxes and fees), but also with borrowed funds, if necessary, or, if the opportunity arises, support funds (provided by NGOs, cooperation bodies or even private investors).

The Community Council is therefore responsible for drawing up and, as necessary, amending the CR's budget. Similarly, it is involved in setting and collecting income taxes and local taxes and

fees, within the limitations set by the State's laws and regulations. If, in practice, the Council is not really involved in setting tax rates (they are uniform from one CR to another), it collects most of the income tax paid by citizens.

Under the Local Governments Code, about 75% of the income tax collected locally must return to the CR. The Council therefore normally has funds it can use before it borrows funds or uses support funds. Even so, previously a large portion of the rural commune budgets came from collection of the minimum local development tax.

The Community Council is theoretically involved most often in the creation of infrastructure. It is responsible for developing and maintaining public thorough fares and squares, as well as tracks connecting the districts in the CR/subprefecture. It is also responsible for resource management. In this capacity, the CR manages firefighting and the setting of bushfires. It is also responsible for adjusting the regime and the terms of access and use for water points of all kinds. It also creates and develops transhumance paths for livestock within the CR (EEM, 2015).

- ***Districts and Sectors***

Even though the district is officially recognized from the administrative standpoint, that is not the case of the sector, even though it represents an extension of local administration. Its role, especially in the study area, is closely related to that of local traditional and religious institutions, whose connections and implications are described in the sections below (EEM, 2015).

- ***Traditional and Religious Powers***

Decisions concerning land management and village matters are generally made by the founding lineage with input from other lineages or by the founding lineage after mandatory consultation of all elders from the other lineages present. The general traditional hierarchy in the community is as shown in Figure 4.16.

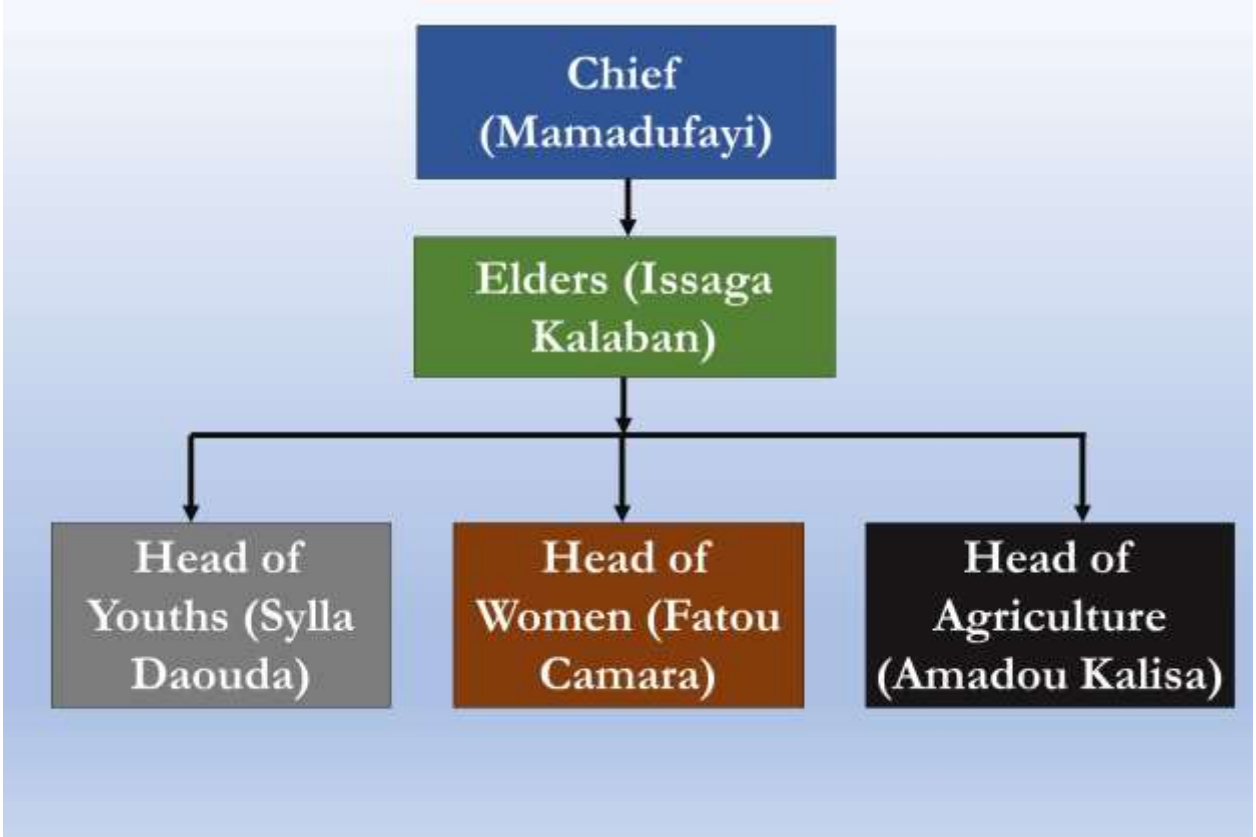


Figure 4.16: Leadership Hierarchy in the Communities around the Project Area
Source: Richflood fieldsurvey, 2022

The various authorities and organizations with power in the communities around the project area are as follows (Swartz, 1980):

1. **Council of Elders:** The members of this council are selected, rather than elected, as a function of their age or their status in the lineage. The council is always overseen by the elder of the founding lineage when the founding lineage has all the traditional power in the village or by the oldest man in the village when decisions are made in common with all the other lineages in the village.

   To belong to the council, a man must fulfil the following criteria: be of good character, honest and able to defend the interests and resolve the conflicts of the village. The members' roles include management of social events (weddings, baptisms and funerals) and land disputes. They are also responsible for ruling on disputes between herders and farmers.

2. **Mosque Council:** This council is overseen by the first Imam. It meets in the villages that have a mosque, but its members may be learned men from other villages that do not have a mosque. The members of this council are selected on the basis of their level of education at Koranic school. They are generally part of the Council of Elders and play fairly similar roles. Even so, if a matter cannot be decided by the Council of Elders, this council is called on to provide religious advice based on Sharia law.
3. **Youth Organizations:** The youth organizations are very active and take part in work to develop their village (opening of roads, construction of mosques, funeral ceremonies, social mutual aid, etc.).
4. **Women's Organizations:** They are central to domestic functions, activities and other work, but they usually are not allowed to take part in decision making in the villages.

❖ ***Boké Prefecture in the National Context***

Boké prefecture is in Maritime Guinea, or Lower Guinea. Located on the coast, west of the Fouta Djallon highlands, the region receives significant flows of water from the mountains and consists of fertile plains. It is generally better equipped than the other regions of Guinea in terms of infrastructure, not only from the social standpoint (schools and medical centers) but also from the commercial standpoint (port and plant).

Boké prefecture has special importance from the national standpoint, given that it has the second-largest port in the country, a national hospital, significant agricultural and mining potential, considerable fisheries resources and university and vocational training centers. The various developmental projects in the Boke show that Boké prefecture has the potential for significant economic growth (EEM, 2015).

4.5.2 Project Area of Influence

The project Zone or Area of Influence (ZoI / AoI) defines the project area, as well as the most directly affected villages closest to the project site. This was calculated based on those villages within a radius of approximately 5 km buffer around the project site. The identified area of influence around the project site include: Kataba, Kataba Fula, Fodecontea, Madina Kareki, Tambobo, Tambouni and Tamaransi.

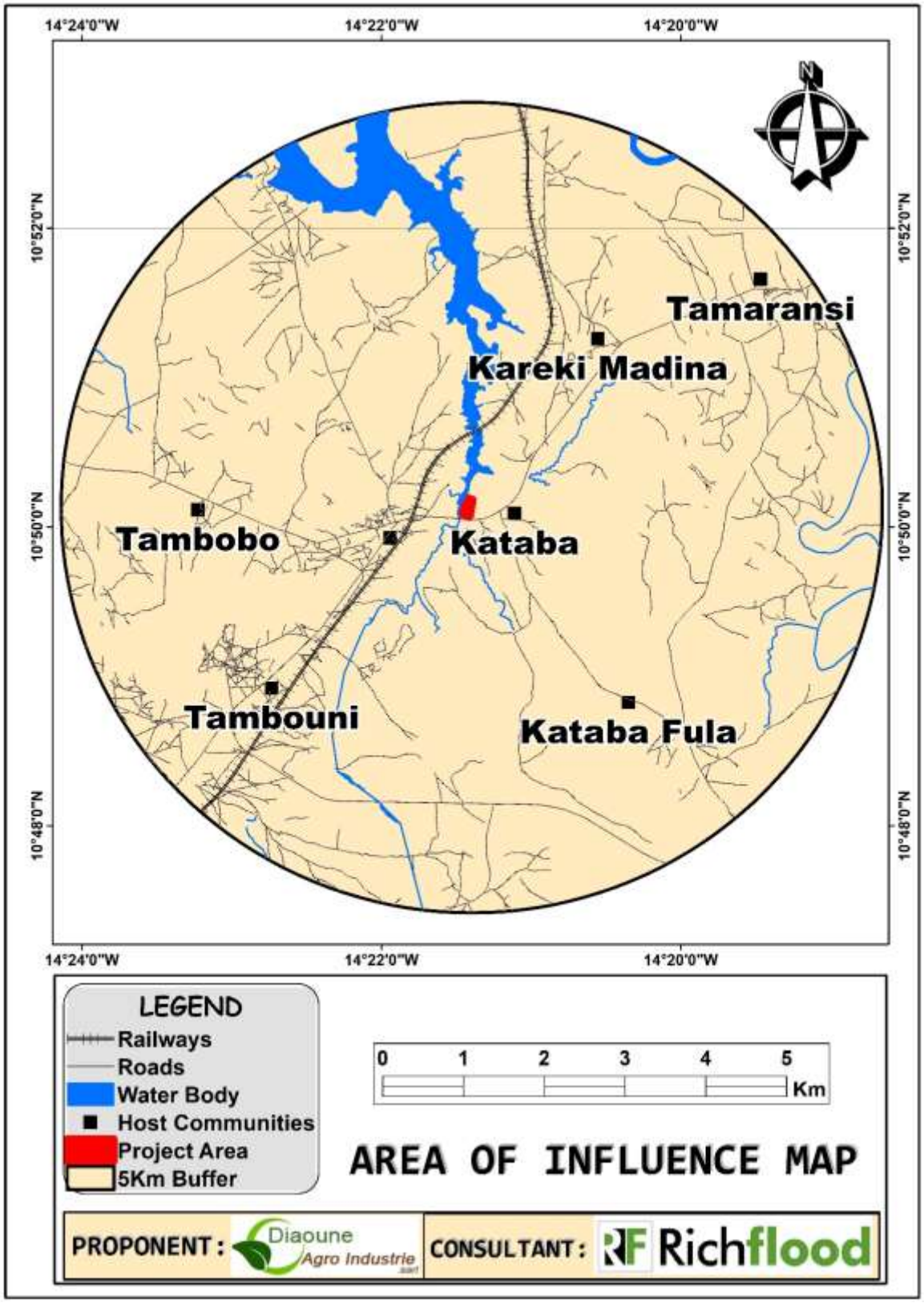


Figure 4.17: Area of Influence Map of the Proposed Project Area

Source: Richflood, 2022

4.5.3 Access to basic social services and related infrastructure

Although most surveyed villages are not connected to the national electricity grid, but majority of the household use Solar Energy, while few uses generator as an alternative source of electricity. About 80.1% uses electricity from the solar while 19.9% uses generator.

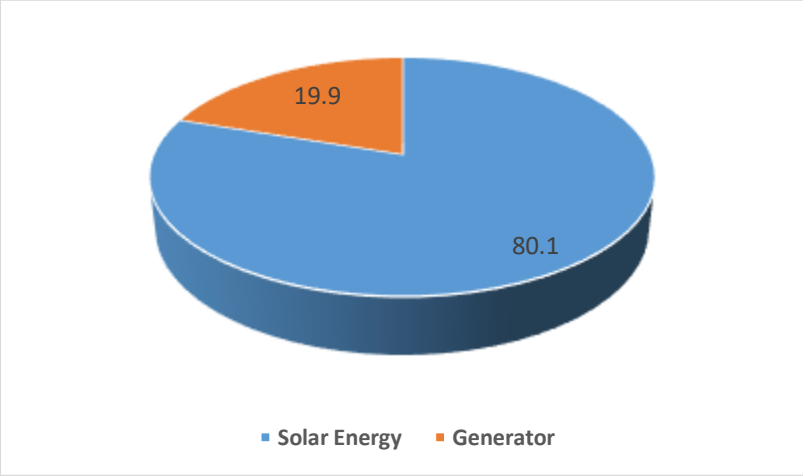


Figure 4.18a: Source of Energy for Lightning

Source: *Richflood 2022*

The bulk of the surveyed area households (53.4%) use wood for cooking, followed by coal and lastly charcoal as shown in Figure 4.18b. Of those households who use "other" sources, some referred to kerosene stove.

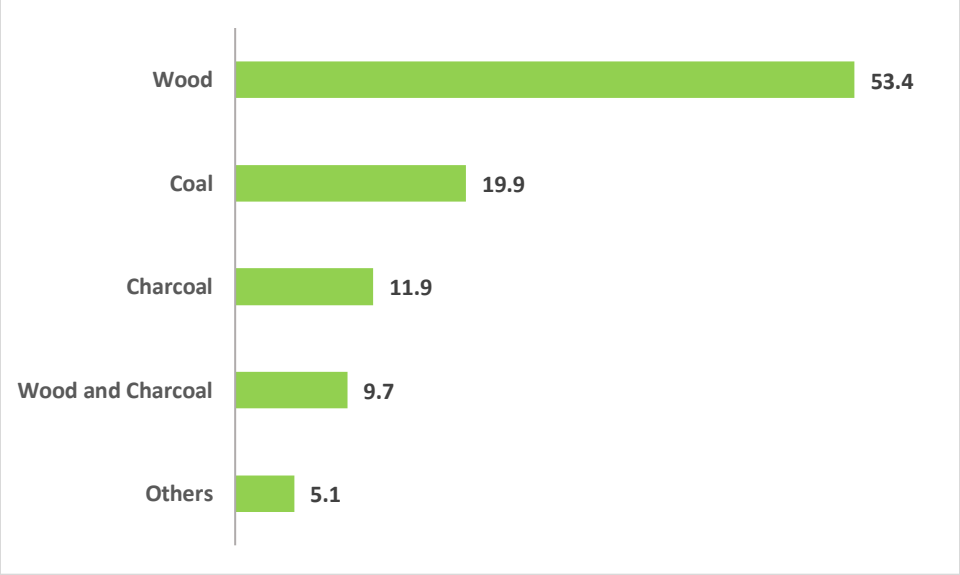


Figure 4.18b: Source of Energy for Cooking

Source: *Richflood, 2022*

Water is needed for the maintenance of health, its importance is not only related to its quantity but also quality. Access to water in the required quantity is needed to achieve good personal and domestic hygiene practices; while good quality does not constituent a health hazard even in a life time of consumption. However, for domestic water supply, over 60% of the villages surveyed has access to private wells, while 34.1% has access to public standpipe.

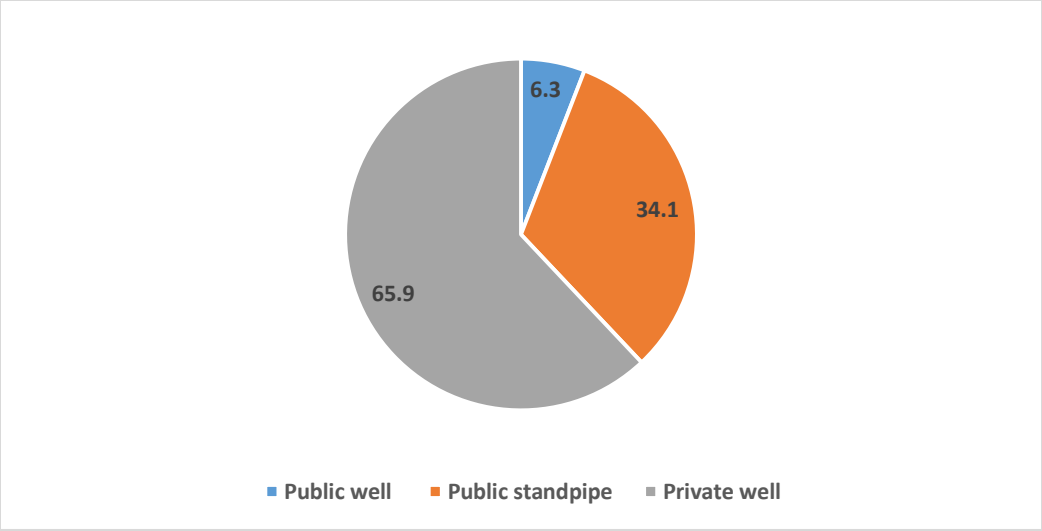


Figure 4.19: Source of Drinking Water at the Project Area

Source: *Richflood 2022*

An estimated 22% of the population have no sanitation at all and use open/public spaces. There is no sewerage system, so those with sanitation use a form of latrine or septic tank. It was reported that residents of the settlements within the AoI have no formal sanitation provision. There is no formal waste disposal system within the community. Residents of the study area generally burn domestic waste or dispose of it in the surrounding bush lands.

4.5.4 Education

Advanced level of educational attainment is pivotal to economic liberation and empowerment. Although, school was only found in Fodecentea, but this school receive students from all the districts. 23.9% of the surveyed populace have no schooling, while 47.7% have primary school, with very few senior secondary school education (Figure 4.20).

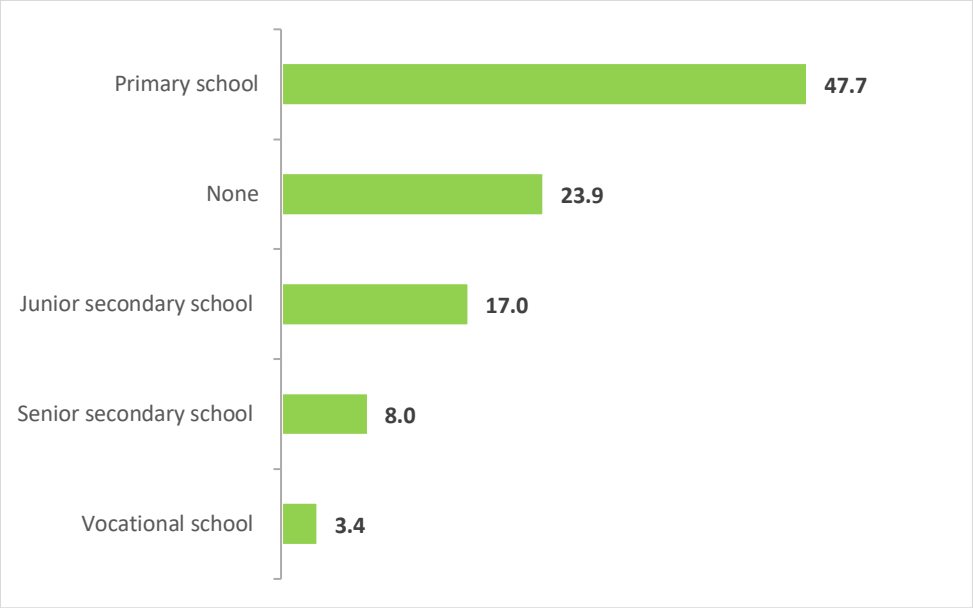


Figure 4.19: Educational Status of the Project area

Source: *Richflood 2022*

Levels of educational attainment by residents within the proposed area are somewhat matched by the level of literacy. About 78% of the surveyed groups reported that they can read as illustrated below in Table 4.19.

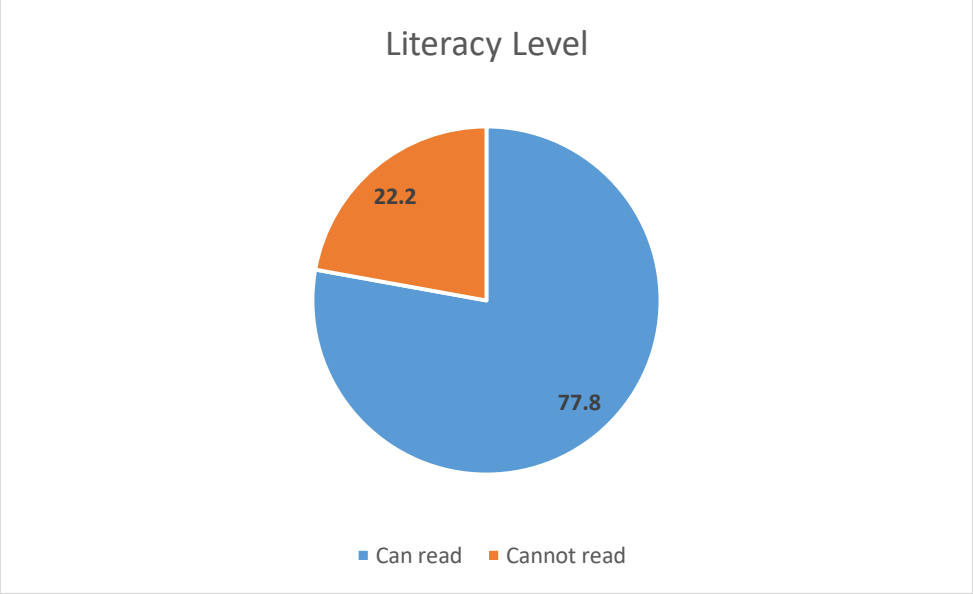


Figure 4.20: Literacy Status of the Project area

Source: *Richflood 2022*

4.5.5 Livelihood practises

Employment

Farming is the predominant occupation of the inhabitants of the studied villages. followed by artisans and self-employed villagers who have their own businesses. Agriculture is the mainstay of the economy of the people, and it cuts across all gender and all segments of the villages. About 53.4% of host communities have farming as their primary occupation, with about 84.1% having it as their secondary occupation. The predominant crops grown are: cashew, vegetables, tubers, maize and mango among many others.

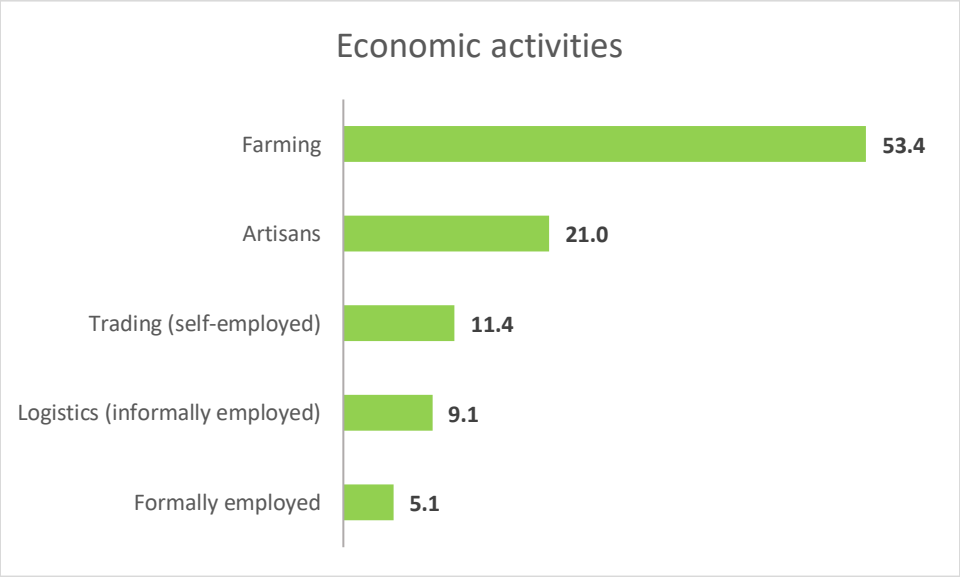


Figure 4.21: Economic activities in the study area

Source: *Richflood 2022*

About 84.1% of farmers own a cashew farm plantation, while 15.9% do not own a cashew farm. Figure 4.22 shows the distribution of cashew plantations ownership and size in the surveyed household.

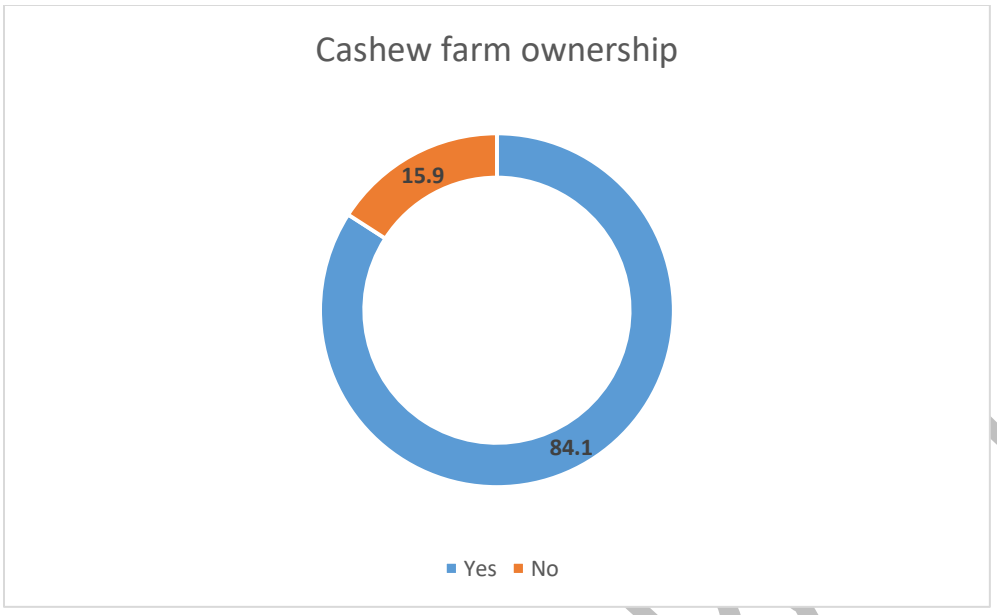


Figure 4.22: Cashew Farm Owners Status at the area

Source: *Richflood 2022*

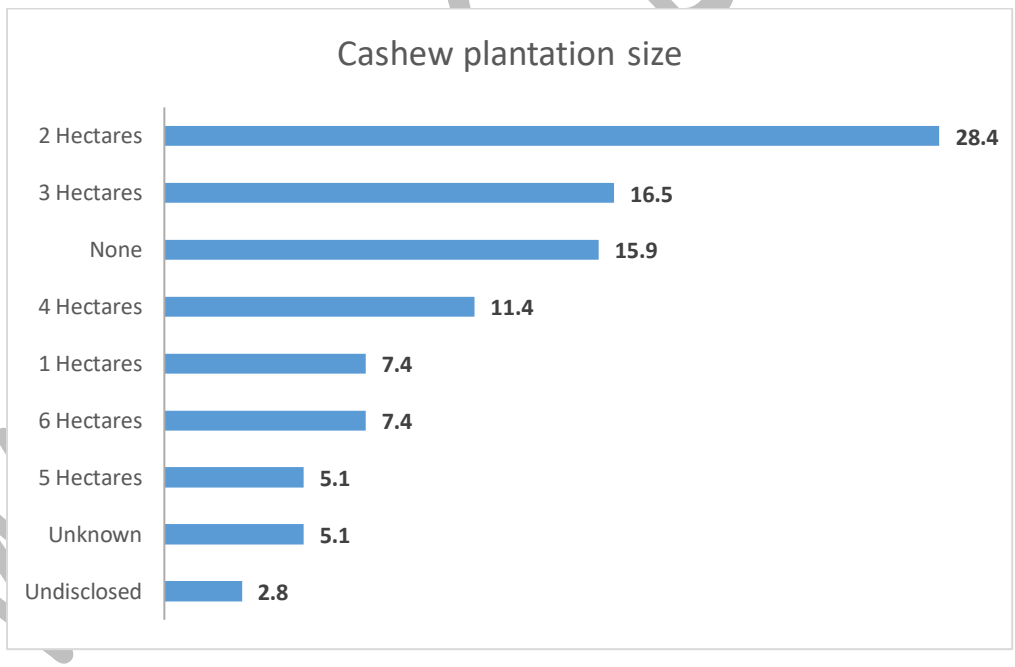


Figure 4.23: Cashew Plantation Status per Household at the area

Source: *Richflood 2022*

4.4.6

deliberately left blank

5. ASSESSMENT OF ENVIRONMENTAL AND SOCIAL IMPACTS

5.1 Introduction

A key part of the Environmental and Social Impact Assessment (ESIA) Study is the impact assessment analysis of how the Project may interact (positively and negatively) with environmental and socioeconomic resources or receptors. This chapter identifies and evaluates the actual and potential environmental consequences of the proposed project activities, with the potential for mitigation of negative impacts and enhancement of positive impacts.

The assessment process involved looking at the environmental baseline features, uniqueness, potential vulnerabilities and the nature, location, and duration of construction activities, and project design features in effect throughout the operation. An understanding of the nature of the impacts, the proposed cashew-nut processing activities or operations would have on the natural and human environment is vital to decision-making on the path of both the company and the government.

This chapter assesses both the associated and potential impacts of the proposed Cashew-nut processing plant. The methodology used for the assessment was designed to ensure a comprehensive and systematic evaluation of all positive and negative effects associated with the different phases of the project. The main goal of the assessment is to identify where mitigation is required to ensure that appropriate control measures and monitoring programs are developed to minimize the adverse effects.

5.2 Impact Assessment Methodology

The purpose of the impact assessment is to identify and evaluate the significance of potential impacts on identified receptors and resources; to develop and describe mitigation measures that will be taken to avoid or minimise any potential adverse effects and enhance potential benefits, and to report the significance of the residual impacts that remain following mitigation.

5.2.1 Predicting the magnitude of impacts

The term ‘magnitude’ covers all the dimensions of the predicted impacts on the natural and social environment including:

- The nature of the change (what resource or receptor is affected and how);
- The spatial extent of the area impacted or the proportion of the population or

community affected;

- Its temporal extent (*i.e.* duration, frequency, reversibility); and
- Where relevant, the probability of the impact occurring as a result of accidental or unplanned events.

5.2.2 Impact Significance Rating

Practicable management measures will be recommended that avoid, and if avoidance is not possible, then reduce, restore, compensate/offset negative impacts, enhance positive impacts and assist project design. Impact matrices for the site preparation, construction and operation phases were created utilizing the following criteria:

Table 5.1: Impact Characteristic Terminology

Impact Magnitude	
Type	**Direct –** impacts that result from a direct interaction between the project and resource/receptor. **Indirect** – impacts that follow from direct interactions between the project and its environment as a result of subsequent interactions. **Induced** – impacts that result from other activities that happen as a consequence of the project.
Extent	**Local** – impacts that are limited to the Cashew-nuts Processing Plant location in Boke and Kankan and the surrounding area. **Regional** – impacts that are experienced beyond the local areas to the wider region. **International** – impacts that are experienced at an international scale i.e. affecting another country.
Duration	**Temporary** – predicted to last less than the project duration. **Short-term** - predicted to last only for the duration of the construction activities (i.e. up to approximately one year). **Medium-term** - predicted to last from one year to the end of the project life (i.e. 5 years). **Long-term** - predicted to continue beyond the project life but will cease in time. **Permanent** – impacts that cause a permanent change in the affected receptor or resource that endures substantially beyond the project lifetime.

Impact Magnitude	
Frequency	**Continuous** – impacts that occur continuously or frequently. **Intermittent** – impacts that are occasional or occur only under specific circumstances
Likelihood*	**Unlikely** – the event is unlikely but may occur during the project. **Possible** – the event is likely to occur at some point during the project. **Likely** – the event will occur during the project (i.e. it is inevitable).

* For unplanned events only.

Magnitude describes the actual change that is predicted to occur in the resource or receptor (*e.g.* the area and duration over which land take will occur; the degree of impact on the livelihoods of a local community; the probability and consequences in terms of accidental events). An assessment of the overall magnitude of an impact is, therefore, provided that takes into account all the dimensions of the impact described above to determine whether an impact is of small, medium or large magnitude.

5.2.3 Sensitivity/vulnerability/importance of resources and receptors

The significance of the impacts resulting from an impact of a given magnitude will depend on the characteristics of resources and receptors to that impact in terms of their sensitivity, vulnerability and importance.

The quality or importance of a resource will be judged by taking into account, for example, its national or international designation, its importance to the local or wider community, its ecosystem function or its economic value. The assessment of the sensitivity of human receptors will consider their likely response to the change and their ability to adapt to and manage the effects of the impact.

5.2.4 Assessment of impact significance

All human activity imposes some level of change on the natural and social environment, because of physical interactions with natural systems or other human activities. To provide information to decision-makers and other stakeholders on the importance of different project impacts, the ESIA team evaluates the significance of each such change.

There is no statutory definition of significance. Therefore, in the ESIA, the evaluation of significance is inherently subjective. It is based on the professional judgment of the ESIA team,

informed by legal standards, national and regional government policy, the current industry good practices and the views of stakeholders. Where specific standards are either not available or provide insufficient information on their own to allow grading of significance, evaluation of significance will take into account the magnitude of the impact and the quality, importance or sensitivity of the affected resource or receptor.

Magnitude and receptor quality/importance/sensitivity are assessed in combination to evaluate whether an impact is, or is not, significant and if so its degree of significance (defined in terms of Minor, Moderate or Major). Impacts ranked as Negligible include those that are slight or transitory and those that are within the range of natural environmental and social change.

Table 5.2 Significance Matrix

Sensitivity / Vulnerability / Importance	**Magnitude of Impact**			
	Negligible	**Small**	**Medium**	**Large**
Low	*Negligible*	*Negligible*	*Minor*	*Moderate*
Medium	*Negligible*	*Minor*	*Moderate*	*Major*
High	*Negligible*	*Moderate*	*Major*	*Major*

- An impact of **negligible** significance is one where a resource/receptor (including people) will essentially not be affected in any way by a particular activity or the predicted effect is deemed to be 'imperceptible' or is indistinguishable from natural background variations.
- An impact of **minor** significance is one where a resource/receptor will experience a noticeable effect, but the impact magnitude is sufficiently small (with or without mitigation) and/or the resource/receptor is of low sensitivity/ vulnerability/ importance. In either case, the magnitude should be well within applicable standards.
- An impact of **moderate** significance has an impact magnitude that is within applicable standards but falls somewhere in the range from a threshold below which the impact is minor, up to a level that might be just short of breaching a legal limit. Clearly, designing an activity so that its effects only just avoid breaking a law and/or causing a major impact is not the best practice. The emphasis for moderate impacts is therefore on demonstrating that the impact has been reduced to a level that is as low as reasonably practicable (ALARP). This does not necessarily mean that impacts of

moderate significance have to be reduced to minor, but that moderate impacts are being managed effectively and efficiently.

- An impact of **major** significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resources/receptors. The aim of IA is to ensure that Project does not have any major residual impacts, however, for some aspects, there may be major residual impacts after all practicable mitigation options have been exhausted (i.e. ALARP has been applied).

For impacts that are initially assessed during the ESIA process to be of *Major* significance, a change in design is usually required to avoid, reduce or minimise these, followed by a reassessment of significance. For impacts assessed during the ESIA process to be of *Moderate* significance, where appropriate the discussion explains the mitigation measures that have been considered, the one selected and the reasons (*e.g.* in terms of technical feasibility and cost-effectiveness) for that selection. Impacts assessed to be of *Minor* significance are usually managed through good industry practice, operational plans and procedures.

The ESIA is intended to help decisions on projects to be made in full knowledge of their likely impacts on the environment and society. The residual impacts and their significance reported in this report are based on the proposed Cashew-nuts Processing Plant as described, i.e. inclusive of all proposed mitigation.

5.2.5 Mitigation measures

According to the IFC's management hierarchy: "Recommendations for management should focus on avoidance, and if avoidance is not possible, then to reduce, restore, compensate/offset negative impacts, enhance positive impacts and assist project design." Hence, one of the key objectives of this ESIA is to identify and define socially and environmentally acceptable, technically feasible and cost-effective mitigation measures. Mitigation measures are developed to avoid, reduce, remedy or compensate for the significant negative impacts identified during the ESIA process, and to create or enhance positive impacts such as environmental and social benefits. In this context, the term mitigation measures include operational controls as well as management actions.

Where a significant impact is identified, a hierarchy of options for mitigation is explored (Table 5.3).

Table 5.3 Hierarchy of options for mitigation

• ***Avoid at Source*** – avoiding or reducing at source through the design of the Project
• ***Abate on Site*** – add something to the design to abate the impact
• ***Abate at Receptor*** – if an impact cannot be abated on-site then control measures can be implemented off-site
• ***Repair or Remedy*** – some impacts involve unavoidable damage to a resource and these impacts can be addressed through repair, restoration or reinstatement measures.
• ***Compensate in Kind*** where other mitigation approaches are not possible or fully effective, then compensation for loss, damage and disturbance might be appropriate

The priority in mitigation is to first apply mitigation measures to the source of the impact (i.e., to avoid or reduce the magnitude of the impact from the associated Project activity), and then to address the resultant effect on the resource/receptor via abatement or compensatory measures or offsets (i.e., to reduce the significance of the effect once all reasonably practicable mitigations have been applied to reduce the impact magnitude).

5.2.6 Residual impacts significance

The degree of significance attributed to residual impacts indicates the level of importance that should be associated with each impact, in the decision-making process on the Project.

Table 5.4 Ranking of residual impacts

Impacts of *Major* significance, whether positive or negative, are considered to warrant substantial weight when compared with other environmental, social or economic costs and benefits; conditions will be expected to be imposed to control and, if necessary, monitor adverse impacts and deliver benefits.
Impacts of *Moderate* significance are considered to be of reduced importance to making decisions, but still warrant careful attention to conditions regarding mitigation and monitoring, to ensure the most appropriate (technically feasible and cost-effective) mitigation measures are used and to ensure benefits are delivered.
Impacts of *Minor* significance are brought to the attention of decision-makers but will be identified as warranting little if any weight in their decision; mitigation will be achieved using normal good practice and monitoring may be required to confirm that impacts are as predicted.

5.3 Screening / Identification of Impacts

The initial stage of the assessment process is the screening of potential impacts. This was conducted based on a preliminary Project description and involved the production of a high-level, matrix of potential interactions between the proposed activities and the surrounding environment. The preliminary interaction matrix for the Project is included in Table 5.5.

Table 5.5: Environmental Impacts Screening Matrix for the Cashew-nut Processing Plant Project

Project Phases and Activities	Physical					Biological		Socio-Economic				
	Soils	Hydrology	Air Quality	Climate Change	Noise and Vibration	Biodiversity and nature conservation	Invasive / Alien species	Livelihood and Socioeconomic activities	Community Health & Safety	Landscape and Visual	Ecosystem Services	Occupational Health & Safety
Construction Phase												
Job creation, training and business opportunities								X	X			
Vegetation clearance/Habitat fragmentation/Habitat disturbance/Wildlife displacement	X	X	X		X	X	X			X		X
Excavation works/Soil erosion and generation of site run-off/ Construction of infrastructure.	X	X	X		X	X		X	X	X		X
Chemical storage/solid waste generation/Dust/Wastewater generation/waste storage and disposal	X	X							X			X
Noise pollution					X				X			X
Equipment/material/worker transport			X	X	X				X			X
The physical presence of workers/Workers' safety									X			X

Project Phases and Activities	Physical					Biological		Socio-Economic				
	Soils	Hydrology	Air Quality	Climate Change	Noise and Vibration	Biodiversity and nature conservation	Invasive / Alien species	Livelihood and Socioeconomic activities	Community Health & Safety	Landscape and Visual	Ecosystem Services	Occupational Health & Safety
Risk of occupational accidents, injuries and diseases									X			X
Water demand and supply/ Water resources/ wells		X							X			X
Operational Phase												
Job creation/ business opportunities/diversification of livelihoods								X	X			X
Accidental events (Increased potential for accidents, the Increased potential for oil spills)	X	X							X			X
Maintenance of landscaped vegetation	X	X				X	X		X	X	X	
Potential for expansion of cashew plantation				X		X		X		X		
Increased noise/odour pollution/pollutants in the air					X	X			X		X	X
Increased potential for oil spills	X	X							X			X
Increased solid (Cashew nutshell and domestic waste) and liquid wastes generation	X	X							X			X

Project Phases and Activities	Physical					Biological		Socio-Economic				
	Soils	Hydrology	Air Quality	Climate Change	Noise and Vibration	Biodiversity and nature conservation	Invasive / Alien species	Livelihood and Socioeconomic activities	Community Health & Safety	Landscape and Visual	Ecosystem Services	Occupational Health & Safety
Flora and Fauna (Habitat fragmentation)						X	X					
Physical presence of workers/Workers safety								X	X			X
Site runoff (uncontaminated rainfall runoff and potentially contaminated drainage)	X	X							X			X
Water supply/ drainage management		X							X			X
Induced traffic			X	X	X				X			X
Potential for GBV and Sexual harassment of female workforce								X	X			X
Increased potential for child labour across the cashew nut value chain								X	X			X
Increased occupational hazards e.g. Musculoskeletal disorders, pruritic dermatitis etc.									X			X
Improvement in the economic status of the host communities								X				

Project Phases and Activities	Physical					Biological		Socio-Economic				
	Soils	Hydrology	Air Quality	Climate Change	Noise and Vibration	Biodiversity and nature conservation	Invasive / Alien species	Livelihood and Socioeconomic activities	Community Health & Safety	Landscape and Visual	Ecosystem Services	Occupational Health & Safety
Equipment/material/worker transport			X	X	X				X			X
Accidental events (spills/uncontrolled releases)	X	X							X			X
Induced traffic			X	X	X				X			X
Increase noise level					X	X			X			X

5.4 Preliminary Assessment of Impacts

From the information provided in the screening matrix above, a more detailed preliminary assessment was performed by assessing the potential interactions between the Project and environmental and social sensitivities to determine whether they are significant or not, based on the magnitude of impacts and the quality, importance or sensitivity of the receiving environment. Mitigation measures are taken into account in assessing the significance of the impact.

- Table 5.7 presents the preliminary assessment of the impacts associated with the construction phase of the Project;
- Table 5.8 presents the preliminary assessment of the impacts associated with the operational phase of the Project; and
- Table 5.9 presents the preliminary assessment of the impacts associated with the decommissioning phase of the Project.

Table 5.6a: Preliminary Assessment – Environmental Impacts during the Construction Phase

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
SITE PREPARATION/ CONSTRUCTION					
Air Quality	Air pollution due to Dust Generation and Green House Gases (GHG) Emissions	• Sprinkling of water on dry and dusty surfaces regularly including the access roads. • Use clean fuels and energy • Use enclosed processing and transportation equipment. • Avoid open burning of waste • Ensure machines and equipment planned for project use are installed with EMS to abate accentuating contributors of climate change.	**Small:** impacts on air quality will be very limited to the project area.	**Low:** Greenhouse gas emissions in Guinea are limited when compared to other countries	**Negligible**
Biodiversity and nature conservation and alien	• destruction of fauna and flora habitats; • removal of existing vegetation on the site; • disturbance to fauna	• the site layout will be optimized to minimize the size of the footprint during construction activities; • areas of required ground disturbance will be clearly defined	**Small:** This will be limited to the project site	**Medium –** the site is a secondary forest with anthropogenic pressure of varying degrees that have	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
species introduction	and flora due to noise and dust generation; • Introduction of alien/invasive species.	and ground disturbance outside these areas will be avoided; and • No alien/invasive species will be planted on the site.		modified the intrinsic value of the project site	
Noise/vibrations	Increase in Noise levels and excessive vibrations with the associated disturbance to communities and fauna	• select recent, well-maintained construction equipment and vehicles compliant with international best practices for noise emissions; • prefer electrical power plant to mechanical alternatives, where feasible; • use of power generators equipped with sound mufflers; • enclosure of the main fixed sources of noise (power generators mainly); • switch off equipment when not in use;	**Small –** noise emissions will be temporary and limited to civil engineering works and site deliveries**.**	**Medium–** The presence of sensitive receptors in the vicinity such as residential areas increases the sensitivity to this type of nuisance.	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		• avoid night-time work; • whenever feasible, schedule different noisy activities to occur concurrently, since the combined noise levels produced may not be significantly greater than the level produced if the operations were performed separately; and • locate stationary equipment as far as practicable from nearby receptors**.**			
Surface Water	Deterioration of surface water quality due to hazardous substances spills	• appropriate sealing of soil surfaces, in particular, where hazardous chemicals (hydrocarbons, maintenance chemicals etc.) are used; • spills prevention plan; • spills response and cleanup plan;	**Small– i**nfiltration of pollutants with runoff water to a nearby stream with the project footprint is expected in the likely event of accidental spills.	**Medium** – Aquatic habitat and potential ecosystem services from the watershed.	Minor

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
Groundwater	Deterioration of the groundwater due to hazardous substances spills and infiltration	• creation of a watertight surface to avoid infiltration into the groundwater; • storage of hazardous substances and wastes (i.e. oil) in tanks/containers in bunded areas; and • appropriate sealing of soil surfaces, in particular where hazardous chemicals (hydrocarbons, maintenance chemicals etc) are used;	**Negligible–** Hazardous chemicals and wastes will be properly stored and secured.	**Medium** – Potential use of shallow groundwater by local communities for domestic use.	Negligible
Waste Management	Impacting on soil and water quality	• Provision of mobile toilets by the contractor to its work-force • Strict adherence to appropriate waste management procedures. • Provision of solid waste/garbage collection containers and sanitation facilities.	**Small:** This will be within the project area	**Medium** Waste generated will be site restricted with access to water bodies.	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		• Segregation of all waste/garbage, biodegradable composited and removed from the facility in accordance with standard procedure for waste management. • Ensure hygiene and sanitation are maintained at the workers' camps.			
Soil	Contamination of soils by fuels, lubricants, chemicals etc.	• Minimized risks of accidental spillage and the clear area immediately if it occurs • Oil traps will be provided for service areas, parking areas etc. • All vehicle maintenance should be done at the site garage which should have an oil-water separator. • Chemicals material such as emulsifiers, stabilizers, petroleum products and solvents shall also be stored at the site in tanks/drums in	**Small–** The potential degradation of soil quality due to the storage of diesel, fuel and lubricant oil is on a local scale and temporary.	**Low** The potential degradation of soil quality due to the storage of diesel, fuel and lubricant oil is on a local scale and temporary.	**Negligible**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		banded areas to control contamination of natural resources in case of spillage.			
Traffic (Transport)	Increased level of traffic due to heavy equipment and machinery transport; Increased road accidents due to unsafe driving habits; Occupational accidents around the construction areas Increased risk of road accident/injuries	• DAI will require all transportation contractors to ensure and demonstrate that all drivers are appropriately trained and hold an appropriate valid driving license. • optimization of routes and schedule of transport of goods and workers to avoid main traffic times to the extent possible • Enforcement of traffic laws and speed limit.	**Small–** increase in traffic during construction including the daily transport of workers and construction materials.	**Low-** Traffic along the existing road (Boke – Kalabouri) leading to the project site is low.	Negligible
Health, safety and security	Increased incidence of alcohol and drug use; Increase in the spread of HIV/ AIDS and other STIs;	• Regular maintenance of construction machinery to minimize accidents and hazards during construction works. • Safety, Health and Environment	**Small–** influx of workers will likely lead to increased health risks and social vices around	**Medium-** potential accident and short-term injury on site	Minor

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
	Accidents such as slips, trips and falls due to loading and unloading activities and movement of materials Site encroachment by unwanted persons.	(SHE) induction course and daily toolbox meetings for workers. • Provision of adequate signage and availability of functional First Aid Kit on site. • Adequate and relevant training of all workers especially local hands on safety issues related to their activities. • The use of well-trained personnel and provision and enforcement of the use of appropriate PPEs on site. • Adoption of safe operating/ construction procedures consistent with good statutory and HSE requirements. • Notice boards with all safety measures to be taken at the construction site and accident,	the project AOI		

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		prone areas will be displayed at all strategic locations within the construction site.			

Table 5.6b: Preliminary Assessment – Social Impacts during the Construction Phase

Aspect	Potential Impact	Mitigation/enhancement	Residual Significance
Presence of Project and workforce	Increased pressure on basic service infrastructure	• DAI targeted community development support in line with Diaoune Agro Industrie SARL's community investment policy. • Develop camp and workforce management protocols. Ensure that these are communicated to all workforce (both DAI and contractors) and ensure that measures are strictly enforced; • Wherever possible, prioritize local employment for the workforce; • Ensure that recruitment and training are transparent and equitable (by implementing procedures that prevent payment of bribes for recruitment) and that the training programmes meet national and international standards for employment and occupational health and safety	Minor

Aspect	Potential Impact	Mitigation/enhancement	Residual Significance
	Increased prevalence of contagious diseases and STDs - HIV/AIDS	• Conduct an awareness-raising campaign with people in the target area and workers on STDs, including HIV/AIDS.	Minor
	Weakened local governance bodies	• provide the local authorities concerned with information on the future construction work (scope, timetable) and on the area to be affected by this work; and • involve local authorities in implementing the impact management tools at all levels of project development.	Minor
	Diseases linked to health and hygiene conditions	• The Project site development will lead to a reduction in stagnant water bodies at the site, hence contributing to malaria prevention in the local area. Diaoune Agro Industrie SARL will reinforce this with malaria prevention & awareness training for staff. • Effluent pond will be treated to prevent mosquitos' proliferation. • Support the authorities (particularly the local health department) and civil society (especially NGOs) to implement hygiene awareness-raising campaigns. • Monitor and assess health and hygiene conditions using an indicator monitoring Dashboard.	Positive

Aspect	Potential Impact	Mitigation/enhancement	Residual Significance
	Local development support: Improved health services	• focus project investment in the health sector; • involve local authorities when implementing development projects; • introduce a health facilities monitoring plan to ensure service quality is maintained and facilities are used appropriately.	Positive
	Inequalities in access to healthcare	• DAI targeted community development support in line with Diaoune Agro Industrie SARL's community investment policy.	Positive
Construction works	Competition for jobs on the construction sites	• Set up a fair and transparent recruitment system that includes a provision to prioritize local residents where applicants are equally qualified • Develop camp and workforce management protocols and ensure that these are communicated to all workforce (both DAI and contractors) and ensure that measures are strictly enforced; • Wherever possible, prioritize local employment for the workforce; • Ensure that recruitment and training are transparent and equitable (by implementing procedures that prevent payment of bribes for recruitment) and that the training programmes meet national and international standards for employment and occupational health and safety	Negligible
		• thorough implementation of Diaoune Agro Industrie SARL's anti-bribery and corruption policy • ensure transparency when allocating funding to the local communities' budget;	Minor

Aspect	Potential Impact	Mitigation/enhancement	Residual Significance
	Increased risk of corruption	• ensure transparency of the recruitment process (skilled-based, equal opportunity policy, with publicly advertised employment opportunities); • develop a project information campaign for all sections of the population; and • prioritize the communication methods most likely to reach the largest number of stakeholders (local media).	
	Development of economic opportunities	targeted community development support in line with Diaoune Agro Industrie SARL's community Investment policy.	Positive
	Improved economic situation of the people recruited and their families	Ensure employment and salary policy are in line with or more favourable than standard Guinean practice.	Positive
	Increased demand and opportunities for local production, greater diversification of economic opportunities and the development of local entrepreneurship	• regularly provide information on contracts to provide goods and services available through the project both locally and nationally, as well as on the standards to be met to win these contracts; • prioritize local or national providers whenever the goods or services required are available at comparable prices, quantities, quality and delivery lead times; • support the development of local entrepreneurship through training,	Positive

Aspect	Potential Impact	Mitigation/enhancement	Residual Significance
		notably on compliance with quality, hygiene and security standards – this measure could be included in a support plan for Guinean companies.	
	Larger budgets allocated to local development initiatives	• targeted community development support in line with Diaoune Agro Industrie SARL's community investment policy; • involve local authorities when implementing development projects.	Positive
Road traffic associated with the Project	Risk of workplace accidents	Respect the measures put in place to ensure workers' safety: wearing personal protective equipment, and applying safety standards.	Minor
	Risk of traffic accidents	• implement the HSE policy; • conduct an awareness-raising campaign with local residents; • identify suitable routes that address local traffic constraints.	Minor
	Risks of Gender Based Violence (GBV), Sexual Abuse and Harassment	• Clauses prohibiting rape, defilement and other Gender Based Violence as well as child and forced labour should be inserted into works contracts • Communities need to be informed about the start of all works, at least 5 days before, and the need for them to keep children away from the sites. • Create a clear system for identifying, responding to, and sanctioning GBV incidents • Display on-site posters prohibiting sexual exploitation and harassment	Minor

Aspect	Potential Impact	Mitigation/enhancement	Residual Significance
		• Availability of female nodal officer for women's issues • Regular GBV/SEA sensitization & training for all employees, workers, transporters, drivers and contractors • Inclusion of gender issues in code of conduct, and dissemination • Regular consultation/counselling of women employees and workers, including for survivors	
	Risk of Child labour and Violence against Children (VAC)	• Children must not be employed by the Project (paid or unpaid), and the Project must comply with all relevant local legislation, including labour laws in relation to child labour and the Bank's safeguard policies on child labour and minimum age. • Create a clear system for identifying, responding to, and sanctioning VAC incidents • Orientation on code of conduct on children's safety, protection and child labour, including for parents; • Establishment of a crèche' for workers' children within the facility;	**Minor**

Table 5.7a: Preliminary Assessment – Environmental Impacts during the Operational Phase

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
OPERATION PHASE					
Air Quality	• Process emissions from streaming (cooking of raw cashew nuts) • Odour from microbial action in stored waste areas • Release of gaseous emissions (SOx, NOx) – with potential effects on air quality from the operation of the plant generators • Exhaust from vehicular movements	• Use of cyclone dust collectors and scrubbers as air pollution control measures to control the emission of particulate matter in the flue gas arising from boilers and power generating sets respectively • Odour (VOCs) generation from the cashew nut steaming process will be treated/ controlled using odour control technologies/equipment • Solid waste generated from process activity will be collected and stored in closed bins to minimise the odour problem near storage areas	**Medium-** impacts on air quality will be limited to the project area.	**Low** – Greenhouse gas emissions in Guinea are limited when compared to other countries	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		• Use of PPE (like nose mask, helmet, ear plugs and glasses) shall be mandatory for workers/ employees/ visitors working in these areas. • Routine inspection and maintenance of engines, vehicles, generators and other equipment to minimise air emissions			
Ecology and Biodiversity	• Impact on vegetation	• Tree planting (re-vegetation) • Care will be taken to avoid any disturbance to the flora and fauna of the area • Care will be taken to minimize de-vegetation of the site. • Conscious efforts shall be made to develop greenbelts on the site	Small - likely migration/loss of fauna from disturbance and habitat fragmentation over the project area extent.	Medium – the surrounding area is made up of secondary forest with a comparative number of fauna and flora abundance	**Minor**
Ecosystem	Impact on freshwater	• Stormwater management plan must be	**Small:** Site or local	**Low:** Potential	Negligible

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
Services	stream quality.	compiled and implemented; • Implement an Erosion and Sediment Control plan; • Implement an alien and invasive species management plan		siltation of surrounding fresh water stream	
Noise and vibration/ Air pollution	An increase in noise levels with the associated disturbance to communities and fauna	• Best practice and good operation management will be applied; • Routine inspection and maintenance of combustion engines to ensure adequate operation; and • Routine inspection and maintenance of engines, vehicles, generators and other equipment to minimise noise emissions.	**Small** – noise emissions will occur at the site during operation. Emissions will not affect local residents as noise level increase above background levels will be barely perceivable for most receptors.	**Medium** - The presence of sensitive receptors in the vicinity such as residential areas increases the sensitivity to this type of pollution.	**Minor**
Surface water	Pollution of surface water	• An agricultural and/or soil capability	**Small– i**nfiltration	**Medium** –	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
	due to runoff of potential pollutants	assessment should be conducted • liquid discharges will be treated in a wastewater treatment unit before being routed to the effluent pond and discharged into the public sewage system or used to water green space	of pollutants with runoff water to nearby streams within the project footprint is expected in the likely event of accidental spills.	Aquatic habitat and potential ecosystem services from the watershed.	
Groundwater	• potential degradation of soil/groundwater quality due to infiltration of potentially polluted water runoff; • potential degradation of soil/groundwater quality due to liquid discharges (black and grey water).	• site area will be watertight in particular for hazardous chemicals or waste storage areas and processing area, to avoid infiltration and affection to groundwater; • storage of hazardous substances and wastes (i.e. oil) in tanks/containers in bunded areas; • liquid discharges will be treated in a wastewater treatment unit before being routed to the effluent pond and	**Negligible–** Infiltration of pollutants with runoff water is not expected unless in case of accidental spills	**Medium** – Potential use of shallow groundwater by local communities for domestic use	Negligible

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		discharged into the public sewage system or used to water green space			
Waste Management	Pollution of soil and water resources	• Identification and classification of waste into different waste classes; • Define a waste hierarchy and waste minimization strategy; • Define and implement procedures for waste handling (i.e. collection, segregation, treatment, storage, transport, disposal, and documentation); • ensure the safe transportation, handling, storage, and disposal of wastes; • provide appropriate training for staff and other stakeholders on waste management issues;	**Medium**	**Medium:** Limited to project site	Medium

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		• Establish dedicated area(s) for the sorting and storage of waste; and • Monitoring, verification and reporting of wastes.			
Climate Change	Potential increase in GHG emissions and Carbon footprint	• Undertaking an energy efficiency audit and using this to inform an emissions reduction options analysis to identify equipment alternatives or energy efficiency opportunities. As part of this consider alternatives to coal as a fuel source and renewable energy options. • Undertake benchmarking studies to analyze the performance of the project relative to industry performance in terms of GHG intensity • Review the GHG emissions inventory annually. The review should highlight the	**Medium**	**Moderate**	Medium

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		biggest contributors and identify any technological developments that could assist in reducing GHG emissions. • Develop a carbon reduction strategy and implement actions. Report against the established baseline per annum/financial reporting year based on changes in the GHG emissions inventory as above.			
Job creation	Increase in employment opportunities and income Employment of women	• Socializing the recruitment process to the community, especially about the number of vacancies, qualifications and available positions • Prioritizing the local workforce to be employed according to the qualification and requirements needed • Provide and communicate clear information about the Project's requirements related to employment	**Positive**	**Positive**	Negligible

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		and business opportunities and priorities locals where feasible.			
Soil	Pollution of soils due to chemicals and or wastes; and land occupation	• creation of a watertight surface to avoid infiltration and affection to groundwater; • storage of hazardous substances and wastes (i.e. oil) in tanks/containers in bunded areas;	**Small–** Considering the creation of a watertight surface and the mitigation measures in place, the potential effect on soils due to the storage of chemicals and wastes is considered limited in extent and temporary in nature, considering any pollution will be cleaned.	**Low -** Existing soils are unproductive.	Negligible

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
Health, safety and security	Injuries due to lifting, carrying and improper sitting techniques (Ergonomics) Burns due to steam exposure Increased incidence of alcohol and drug use; Increase in the spread of HIV/ AIDS and other STIs; Slip, Trip and Fall due to uneven surfaces and obstacles; Encroachment by unwanted persons.	• DAI will be committed to ensuring all H&S measures are in place to prevent accidents and reduce the consequences of non-conformance events; • DAI will provide training, awareness and supervision to ensure all of its construction workers comply with the OHS procedures; • DAI will provide all appropriate resources i.e. personal protective equipment (PPE) to all workers onsite such as masks, helmets, gloves and earplugs etc. and ensure their usage; • An emergency response procedure and infrastructure will be available on-site to ensure the provision of first aid for personnel in case of an emergency. • Provision of adequate signage and	**Medium-**	**Low-**	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		availability of functional First Aid Kit on site. • Adequate and relevant training of all workers especially local hands on safety issues related to their activities.			
Child labour	Loss of quality childhood, health issues, Mental trauma, illiteracy	• Develop a Company Policy on children's well-being which explicitly mentions the company's commitment to not employ underage workers and to support the education and best interests of children • Create demand for skilled and trained workers • Empowerment of poor people • Check worker's list and make sure that all workers are above the minimum working age;	**Medium**	**Low**	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
Grievances	Conflicts with host communities and third-party agitation	Facilitate implementation of existing MoU between Diaoune Agro Industrie SARL and Host/neighbouring communities Adopt the grievance redress mechanism	**Small**	**Medium**	**Minor**
Occupational Health and Safety	• Falls, temperature, and other factors which can harm the worker without necessarily touching are the major physical hazards inducing fear among workers. • permanent burn marks of the caustic cashew sap in hands which is a chemical hazard • dermatitis and dry skin in workers	• Eliminate open defecation by providing separate well-maintained toilets for men and women with provision for physically challenged people at least one toilet. • The solid waste generated will be collected and stored in bins to avoid order, and unhygienic conditions and stay animal nuisances. • Maintain walkways and working surfaces to be clean and dry by preventing spillages of water/liquids during operational activities	**Small**	**Medium**	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
	• Inhalation of smoke results in chronic respiratory illness and allergic asthma in the long term. • Bites and stings from insects such as mosquitoes which cause dermatitis and other contagious diseases, and un-hygienically maintained toilets • Repetitive movements, Uncomfortable workplace and Poor body positioning • Joint pain, back pain, wrist pain, neck pain,	• Provide personal protection equipment (PPE) like helmets, shoes, gloves and ear plugs/ ear muffs to the workers. • Notice boards with all safety measures to be taken within the site and accident-prone areas will be displayed at all strategic locations within the site. • Speed of transport vehicles will be restricted to 20 km/hr and proper sign boards at entry exist, turning and accident-prone areas shall be provided to minimise accidents within the site. • Medical doctor (MBBS) will be available within the site once a week to attend to the medical needs of			

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
	shoulder pain etc	labours and construction labour. • All workers shall be trained on basic ergonomics principles. • This should cover the correct lifting, carrying and setting down techniques to prevent incidences of hernias, sprains, strains, back injuries and other muscular-skeletal disorders due to improper handling of objects.			

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
Vehicular Traffic Accidents	Increase in traffic density; impact on traffic safety, contaminate/ pollute air, land, plants, disturbance to wildlife Increased road accident/ injuries	• application of the company's road safety policy to operator and contractor vehicles; • optimization of routes and schedule of transport • Development of a Traffic management plan. • Creating parking areas for vehicles. • Conduct public awareness on road safety for the general public • Enforce speed and exhaust limits • Alcohol and substance abuse screening among drivers and machine operators	**Small–**	**Medium-**	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
Fire and explosion hazards		• Major exposed portions of the boiler unit are to be thermally insulated • Regular inspection of safety valves for proper functioning • Optimization of convective exchanger arrangement to prevent corrosion • Necessary measures and training to be given to the personnel operating near the boiler • All employees and labour working in the processing & boiler area should be properly trained and made aware of standard operating procedures/ manuals. • All employees and labour working in the processing & boiler area should be made aware of the risks involved and preventive steps to be taken in	**Small–**	**Medium-**	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		case of any discrepancies/ deviations observed from standard operating procedures. • Defined reporting and escalation mechanisms should be documented and communicated to all employees and labours working in the processing & boiler area. • All electrical wiring, rewiring or extension work must be carried out by licensed electrical contractors. On completion, the contractors should test before the electricity supply is connected. • To ensure electrical safety in the facility, a current-operated earth leakage circuit breaker (ELCB) or residual current circuit breaker			

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		(RCCB) set to operate at a very small leakage current is recommended. In case of dangerous electrical leakage to the earth, it should automatically cut off the supply of electricity. • An emergency evacuation plan to be prepared • Regular mock drills to create awareness on procedures to be followed in times of emergency situation/evacuation.			

Table 5.7b: Preliminary Assessment – Social Impacts during the Operational Phase

Aspect	Potential Impact	Mitigation/ Enhancement	Residual Significance
Plant operations	Development of economic opportunities	Targeted community development support in line with Diaoune Agro Industrie SARL's community investment policy.	Positive
	Improved economic situation of the people recruited	Ensure employment and salary policy are in line with or more favourable than standard Guinean practices.	Positive
	Increased inequalities between Households	Ensure economic opportunities are available for the maximum number of directly impacted households (or districts).	Minor
Labour and working conditions	Exploitation of workers	• Develop transparent human resources policies and procedures for recruitment process, working conditions and Terms of Employment wages, worker-employer relations, Grievance Mechanism, nondiscrimination, monitoring, roles and responsibilities following the Guinea Labor Code and ILO conventions. • Provide reasonable, and if applicable negotiated working terms and conditions. • Establish workers' grievance mechanisms, so that potential conflicts can be dealt with in an early and proper way.	

Aspect	Potential Impact	Mitigation/ Enhancement	Residual Significance
		• No use of child labour (workers under age 18) or forced labour. • Provisions to ensure compliance with labour standards by supply chain and subcontracts, including training if required. • Provide proper workplace facilities for water/sanitation/restrooms. • If the case of retrenchment needs first viable alternatives are analysed and then the adverse impacts of retrenchment on workers are reduced as much as possible. A transparent retrenchment plan will be prepared. • A worker's grievance mechanism will be in place.	
Plant operations	Diseases linked to health and hygiene conditions	• the Project site development will lead to a reduction in stagnant water bodies at the site, hence contributing to malaria prevention in the local area. Diaoune Agro Industrie SARL will reinforce this with malaria prevention & awareness trainings to staff; and • as part of Diaoune Agro Industrie SARL community investment policy, consider supporting the authorities (particularly the local health department) and civil society (especially NGOs) to implement hygiene awareness-raising campaign.	Positive
	Local development support: Improved health	• consider focusing project investment in the health sector: • involving the communities and local authorities when constructing basic infrastructure or implementing development projects to identify	Positive

Aspect	Potential Impact	Mitigation/ Enhancement	Residual Significance
	services	their exact needs (ensure the investment is included in the communes' local development plans); and • carrying out monitoring by implementing a health facilities monitoring plan at the start of the project to ensure service quality is maintained and facilities are used appropriately.	
	Inequalities in access to healthcare	Introduce awareness-raising, communication and information programs for women to facilitate their access to primary healthcare (for themselves and their children).	Positive
	Risk of workplace accidents	Respect the measures put in place to ensure workers' safety: wearing personal protective equipment, and applying safety standards.	Minor
	Risks of Gender Based Violence (GBV)	• Include in works contract clauses on mandatory and regular training for workers on required lawful conduct and legal consequences for failure to comply with laws on non-discrimination and GBV • Insert clause requiring contractors and consultants to cooperate with law enforcement agencies investigating cases of gender-based violence • A minimum requirement of female employment should be indicated in contract documents • Contact numbers of representatives on the Grievance Redress Committee	Minor

Aspect	Potential Impact	Mitigation/ Enhancement	Residual Significance
		and GBV Service Providers should be pasted around the project site and within the immediate project zone • Discuss issues of Gender Based Violence at daily Toolbox meetings • Display on site posters prohibiting sexual exploitation and harassment • Create a clear system for identifying, responding to, and sanctioning GBV incidents • Availability of female nodal officer for women's issues • Regular GBV/SEA sensitization & training for all employees, workers, transporters, drivers and contractors • Inclusion of gender issues in code of conduct, and dissemination • Regular consultation/counselling of women employees and workers, including for survivors	
	Increased potential for child labour and Violence against Children (VAC)	• Children must not be employed by the Project (paid or unpaid), and the Project must comply with all relevant local legislation, including labour laws in relation to child labour and the Bank's safeguard policies on child labour and minimum age. • Develop a Company Policy on children's well-being which explicitly mentions the company's commitment to not employ underage workers and to support the education and best interests of children;	Minor

Aspect	Potential Impact	Mitigation/ Enhancement	Residual Significance
		• Create a system that increases the company's visibility of all its workers and ensures that only workers who are above minimum working age are hired; • Communicate the company's commitment to mitigate the risks of child labour; • Support the provision of basic education; • Ensure rational and achievable work targets so that workers can get minimum wage by working within normal working hours without any help; • Check worker's list and make sure that all workers are above the minimum working age; • Create a clear system for identifying, responding to, and sanctioning VAC incidents • Orientation on code of conduct on children's safety, protection and child labour, including for parents; • Establishment of a crèche' for workers' children within the facility;	

Table 5.8a: Preliminary Assessment – Environmental Impacts during the Decommissioning and Closure Phases

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
Decommissioning/Closure of project					
Air Quality	Impact on human health associated with air pollutant emissions	• Maintain all equipment in good working order and do not leave running when not in use. • Develop and implement a complaints system and make the community aware of the complaints procedure. • Monitoring air quality during decommissioning.	Small	Medium	**Minor**
Ecology and Biodiversity	Disturbances such as road kills and collisions. Removal of vegetation in the area. Direct mortalities due to habitat loss.	• Speed limits must still be enforced to ensure that road killings are limited; • Staff should be educated about the sensitivity of faunal species and measures should be put in place to deal with any species that are	Medium	Low-Site or local	Minor

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		encountered during the construction process. The intentional killing of any animals including snakes, lizards, birds or other animals should be strictly prohibited; • No trapping, killing or poisoning of any wildlife is to be allowed on site, including snakes, birds, lizards, frogs, insects or mammals. • An Erosion and Sediment Control plan must be compiled and implemented; • Area must be rehabilitated progressively to reduce the impact of erosion long term.			
Ecosystem Services	Degradation of soil resources/vegetation associated with ecosystem services	• Utilise topsoil in rehabilitation • Revegetate the area with indigenous vegetation	Small	Medium	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
Socio-economic Impacts	Impact on household income	• An IFC compliant decommissioning and closure retrenchment plan, which includes measures related to livelihood restoration and creating community independence should be developed with the involvement of the villages and must include a comprehensive stakeholder strategy and disclosure phase	**Small**	**Medium**	**Minor**
Waste Management	Impact on water and soil resources.	• Implementation of site-specific Land Reclamation & Rehabilitation Plan Implementation of Waste Management Plan	Medium	Low-Site/Local	**Medium**
Surface water	Chemical contamination of surface water resulting from accidental spills, handling and	• Store all potential sources of contamination in secure facilities with appropriate Storm Water management systems in place to	Small	Medium - Regional	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
	runoff	ensure that contaminants are not released to the water resource through Storm Water runoff.			
Groundwater	Contamination resulting from seepage from hazardous materials and waste	• Manage waste in accordance with the Waste Management Plan.	Small	Medium - Regional	**Minor**
Equipment /Machinery	Disposal of Construction Equipment/Machinery, workshops and other associated facilities	• Honour the terms of agreement in the MoU. • Give monetary compensation to laid-off worker; • Disposal of equipment, machinery, mill, houses, vehicles, spare parts, chemicals and other materials and remediate and restore impacted sites. • The area should be cleaned and all domestic wastes, debris/waste	Medium	Low-Site/Local	**Minor**

Aspect	Potential Impact	Mitigation & Management Measures	Impact Magnitude	Receptor Quality, Importance or Sensitivity	Residual Significance
		metals, grease and oils must be cleaned up and disposed of in a manner approved.			

Table 5.8b: Preliminary Assessment – Social Impacts during the Decommissioning/Closure Phase

Aspect	Potential Impact	Mitigation/ Enhancement	Residual Significance
Closure	Reduction in local employment opportunities	• DAI supports local entrepreneurship through local community development strategy.	Moderate
	Reduced economic circumstances of the people made redundant and their families	• Provide employees with a severance package in line with Guinean standards or more favourable.	Moderate
	Discontinuation of budget allocations to local development initiatives	• Decrease the amount allocated to community investment over time to phase in the transition. • Gradually withdraw allocations to local institutions' budgets.	Moderate

6.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN (ESMP)

6.1 Introduction

This Environmental and Social Management Plan (ESMP) was prepared on the basis of the results of the ESIA on the Cashew-nut Processing Plant project. Its aim is to meet the requirements of the Environment Code in Guinea. It has also been developed with the aim of complying with international good practices applicable to impact studies, meeting the requirements of IFC environmental Performance Standards.

The aim of the ESMP is to provide a framework for the environmental and social management of the Project, translating the mitigation measures specified in the ESIA into a plan for implementation of the Project. Thus the ESMP:

- lists mitigation measures to be implemented by the Project for every phase in its implementation, with the aim of complying with Guinean regulations and international standards and good practices; and
- provides a framework for monitoring or even auditing project compliance with these standards and good practices.

The ESMP is supplemented by:

- A Stakeholder Engagement Plan;
- Occupational Health and Safety Plan; and
- Emergency Preparedness and Response Plan.

These plans should be considered as dynamic and should be updated and made operational as new information becomes available.

6.2 Environmental Management Measures

As required by the Guinean ESIA guide, for each measure, objectively verifiable monitoring indicators (OVI), means of verification (MV) and the person in charge of implementing the measure are suggested.

Management measures from the ESIA are presented in the subsequent sections. .

6.2.1 Mitigation Measures during the Construction Phase

The mitigation measures presented below are to be carried out by the project contractors, design team and project management team, during the construction of the cashew-nut processing Plant.

Table 6.1: Mitigation measures for construction phase impacts for the cashew-nut processing Plant

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency and Responsibility
Impacts on air quality								
Site machinery, transport vehicles	Impact on air quality from combustion engine emissions	Local people within project site, Workers	Regular maintenance and inspection by the contractor in charge of the works	Vehicle maintenance Visual observation	Maintenance report.	Throughout the construction phase	Contractor	DAI HSE manager Once/month
			Reduction of atmospheric emissions from vehicles by limiting the number of vehicle deployed on site as much as possible	Vehicle fuel consumption	Monthly report from the Site or HSE manager	Throughout the construction phase	Contractor	DAI HSE manager Once/month
			Ensure that vehicles and machines are turned off when they are not being used.	Visual observation	Monthly report from the Site or HSE manager	Throughout the construction phase	Contractor	DAI HSE manager Once /month
Storage and transport of construction material	Impact on air quality due to odour/dust emissions	Local people within project site, Workers	• Suitable management and maintenance of construction materials' storage areas to minimise clouds of particles; and • Covering of storages of materials likely to be carried by the wind.	Visual observation	Monthly report from the Site or HSE manager	Throughout the construction phase	Contractor	DAI HSE manager Daily

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency and Responsibility
			• Cover truck loads that generate dust.					
Onsite transportation	Impact on air quality due to dust emission	Local people within project site, Workers	• Set speed limits on non-asphalted site access tracks. • Regular wetting of project site and access tracks.	Visual observation	Monthly report from the Site or HSE manager	Throughout the construction phase	Contractor	DAI HSE manager Daily
Impacts on ambient noise levels								
Machinery, vehicles and all sources of noise	Ambient noise	Local communities	Undertake all noisiest construction / maintenance activities during daytime.	Number of nights worked less than 20% of the total number of days worked	Worksite register	Throughout the construction phase	Contractor	DAI E&S manager, Contractor Once/month
			Regular maintenance and inspection by the contractor in charge of the works	Vehicle maintenance Visual observation	Maintenance report.	Throughout the construction phase	Contractor	DAI HSE manager Once/month
Impacts on biodiversity								
Fauna and Flora	Impacts on fauna and flora	Wildlife is affected by the construction	Construction development area shall be fixed, not develop or cut trees out of project area.	Visual observation	Assessment report monthly	Throughout the construction phase	Contractor	Contractor E&S manager
Impacts on water resources								
Water requirements	Quantitative impact on water resource	Water resource	Optimize water consumption and minimise wastage;	Volume of water consumed per day	Monthly report from the HSE	Throughout the construction phase	Contractor	DAI HSE Manager

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency and Responsibility
			check for absence of leaking equipment; supervise water consumption to identify any over-consumption and provide a basis from which to improve efficiency.		Manager Analysis of water volumes will identify any over-consumption which must be justified.			
Discharge of sanitation effluent	Impacts on water quality	Surface water and groundwater	Check and regular maintenance of the waste water evacuation system (temporary and permanent septic tanks)	Volumes of effluent emptied	Monthly reports from the HSE Manager	Throughout the construction phase	Contractor	DAI HSE Manager
Surface run-off from rain water	Impacts on water quality	Surface water and groundwater	Check and regular maintenance of the drainage system; and the drainage system for non-contaminated water will be separate from the contaminated water collection system.	Visual check on management means after every major rainfall episode.	Monthly reports from the HSE Manager	Throughout the construction phase	Contractor	DAI HSE Manager
Impacts from accidental events								
Accidental spillages or leaks from the lubricant oil/diesel	Impacts on water quality	Groundwater	Proper storage of oil and fuels (liquids stored in bunded areas, all stored in covered places, etc.);	Visual observation	Monthly report from the HSE manager	Throughout the construction phase	Contractor	DAI HSE manager An audit of the way in

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency and Responsibility
fuel from the worksite machinery.			Proper maintenance of vehicles and machinery according to manufacturer's specifications; and development of a management plan of dangerous products.					which products are stored must be carriedout once a month.
Impact on road traffic								
Transport of construction materials	Road traffic impact	Local people, road infrastructures	application of the company's road safety policy to operator and contractor vehicles; optimization of routes and schedule of transport of goods to avoid peak traffic times (7-10 am and 4-7 pm) to the extentpossible; in case of temporary road closure or any other disruption, place adequate signallingin advance of operations to inform road users of potential disruptions	Monitoring of daily travel associated with the Project	Daily reports from the HSE manager	Throughout the construction phase	Contractor	DAI HSE manager
Social impacts								

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency and Responsibility
Construction works	Potential of conflict with the community	Local communities, local authorities, employees	consider associations and grassroots organizations as project stakeholders in their own right whose legitimacy is recognized by both the authorities and local residents: provide them with information, involve them in project monitoring; and implement a grievance mechanism in line with international standards. Prioritize the communication methods most likely to reach the largest number of stakeholders (local media).	Number of grievances received	Weekly reports from community liaison officer	Throughout the construction phase	Contractor	DAI HSE manager Monthly
HIV/AIDS	Increased potential within the community	Local communities, employees	An HIV-AIDS awareness campaign via approved service provider shall be implemented	Number of infection reported	Monthly reports from Health liaison officer	Throughout the construction phase	Contractor	DAI HSE manager Once/month
Child labour	Increased potential for Child labour	Local communities, employees	Prevention of Child labour through implementation of Children's right and	Number of underaged workers involved in the	Monthly reports from the community	Throughout the construction phase	Contractor	DAI HSE manager Once/month

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency and Responsibility
			awareness campaigns	construction works.	liaison officer			
Employment of local labour	Local employment (positive impact).	Local people and employees	• Ensure employment and salary policy are in line with or more favourable than standard Guinean practices; and • Ensure transparency of recruitment process (skills based, equal opportunity policy, with publicly advertised employment opportunities).	Monitoring of the number of local employees of the Project	Recruitment plan / policy. Recruitment policy. Before the start of the works and checks during the construction work.	Prior to start-up of the construction works	Contractor	Contractor's HR manager
Impacts on health and safety								
Transport	Road safety risk	Local people and employees	• Develop a traffic plan comprising notably the establishment of speed limits for trucks around the cashew-nut plant area; • installation of adequate signs in the Project's surroundings; • Plan a timetable for traffic caused by the	Number of deviations observed	Daily reports from the HSE manager	Commencement of the construction works	Contractor	Site manager

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency and Responsibility
			Project to avoid, if possible, peak traffic times.					
			Awareness campaign for drivers and populations exposedto the road risk in the Plant surroundings.	100% of drivers who have attended training	Monthly reports from the HSE manager	Prior to and during construction works	Contractor	Site manager

6.2.2 Mitigation Measures during the Operation Phase

The mitigation measures presented below are to be carried out by DAI management team, especially the onsite factory workers during the operation of the cashew-nut processing Plant.

Table 4.2: Mitigation Measures during the Operational Phase

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency & Responsibility
Administrative procedures and applicable regulations								
Operation of the Cashew-nut Processing Plant	Non-compliance with applicable Guinean requirements and regulations	N/A	DAI will ensure compliance with administrative procedures required within the frame of this project.	Absence of regulatory non-compliance	Obtained authorizations	Before the operational phase	Diaoune Agro Industrie SARL	DAI Management
Climate Change								
Operation of Power generating set	Generation of GHG emissions	Local communities and workers	Prioritize energy efficiency by synchronising all activities and reducing generator operation when factory is not in operation.	Amount diesel consumption	Monitoring and recording	Throughout Operational phase	DAI factory Manager	DAI HSE manager
Impact on air quality								
Operation of boiler and steaming (cooking) machine	Emissions (NO_X, SO_2, and particulate matter) and impacts on air quality	Local communities & workers	Installation of scrubbers and Cyclone dust collector.	Clear air shed around boiler stack during cashew processing	Monitoring and recording of air emissions.	Throughout Operational phase	DAI factory Manager	DAI HSE manager
Power generating set operation	Air emissions (NO_X, SO_2) and impacts on air quality	Local communities & workers	Air quality monitoring of ambient air quality over the long term.	Air quality monitoring of ambient air quality over the long term.	Monitoring report	Throughout Operational phase	DAI factory Manager	DAI HSE manager
Offensive Odour	Impact on air quality	Local communities and workers	Installation of scrubber to boiler to reduce emission during cashew processing	Reduce odour around factory during	Monitoring report	Throughout Operational phase	DAI factory Manager	DAI HSE manager

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency & Responsibility
				operation				
Machinery, transport vehicles	Impact on air quality from combustion engine emissions	Local communities and workers	• Regular inspections and maintenance of vehicles; • Deployment of staff bus for causal staff transportation to and from the factory.	Numbers of vehicles and maintenance record of official vehicles	Vehicle inspection certificates	Throughout Operational phase	DAI factory Manager	DAI HSE manager
Impacts of noise emissions on ambient noise levels								
Generator operation	Ambient noise	Local communities and workers	• Locating plant equipment (e.g. generators) as far from the nearest potential sensitive receptors as possible, and using on-site structures and terrain to screen sensitive locations wherever practicable. • Generator will be provided with acoustic enclosure.	Noise level within the factory	Environmental monitoring report (section on noise)	During design of the cashew-nut processing factory layout. Throughout the duration of plant operations.	DAI factory Manager	DAI HSE manager
Cashew factory and machinery operation (forklift, mini bike etc.)	Ambient noise	Local communities and workers	• Regular maintenance of equipment,machinery and vehicles in accordance with supplier specifications to prevent increase in noise emissions; and • Consideration of noise performance in the selection and procurement of equipment in line with international good	Noise level within the factory	Environmental monitoring report (section on noise)	During design of the cashew-nut processing factory layout. Throughout the duration of plant operations.	DAI factory Manager	DAI HSE manager

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency & Responsibility
			practice in terms of noise emissions					
Ecology and Biodiversity								
Operation of factory	Displacement and fragmentation of the faunal community due to ongoing anthropogenic disturbances (noise, light, traffic, dust, pollution).	Biodiversity resources	• Implement training to ensure that all staff are aware of faunal sensitivity; • No trapping, killing or poisoning of any wildlife is to be allowed around factory site.	Wildlife abundance around the project site and Assessment.	Monitoring and reporting	Throughout the operation phase	DAI factory Manager	DAI HSE manager
	Pollution of the natural water resources utilised by wildlife	Biodiversity	Leaking equipment and vehicles must be repaired immediately or be removed from project area to a suitably designed facility to facilitate repair.	Visual observation and Assessment	Monitoring and reporting	Throughout the operation phase	DAI factory Manager	DAI HSE manager
Impacts on water resources								
Water consumption	Impacts on waterresources	Populations (pressure on the resource)	• optimisation of water consumption and minimisation of wastage; and • Monitoring of water consumption toidentify any over-consumption.	Volume of water consumed.	HSE Manager's reports on water. Evolution of consumption over time. Number of unexplained consumption	Throughout the operation phase.	DAI factory Manager	DAI HSE manager

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency & Responsibility
					peaks.			
Accidental spillage	Impacts on water quality	Groundwater	Regular check on installations to prevent any leakage or accidental spillage.	Number of problems observed and results of groundwater monitoring campaigns.	Environmental monitoring report (section related to groundwater quality monitoring)	Throughout the operation phase.	Maintenance manager	DAI HSE manager
Wastewater effluent (Sewage & CNSL)	Wastewater effluent discharge to streams, affecting water quality for downstream users	Surface water	Implement Waste Management Plan based on the framework provided. Discharge only treated wastewater to streams, to compensate for abstraction losses;	Visual observation and Assessment	Undertake monthly monitoring up-gradient and down gradient of the discharge point.	Throughout the operation phase	DAI factory Manager	DAI HSE manager
Community Health and Safety								
Cashew processing operation	Pollution of soil & water with CNS and CNSL Pollution air from boiler emissions Noise during factory operation	Workers and local residents	• All other measures listed for management of socio-economic impacts to be followed through. • All measures in the Air Quality Impact Assessment, Noise Impact Assessment, and Hydrology Impact Assessment to be followed through.	Visual Observation and Site Assessment	Monitoring and reporting	Throughout the operation phase	DAI factory Manager	DAI HSE manager
Occupational Health and Safety								

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency & Responsibility
Cashew nut processing operation at the factory (shelling)	• Risk of burnt hands from handling steamed RCN • Risk of cauterization from CNSL	Factory workers	• Routine Medical check-up for factory workers • Provision and enforcement in the use of PPE (hand glove, shoes, nose mask) • Ensure routine breaks in-between work to stretch out stiff body parts.	Number of reported work related health issues. Number of Grievances reported	Employee Health records Employee welfare records	Throughout the operation phase	DAI factory Manager	DAI HSE manager
Cashew kernel Peeling	• Work-related health hazard including finger deformities, finger pain, numbness, and bleeding from finger nails. • Postural stress including back pain, stiff neck, strain on eye muscles, muscular discomforts, shoulder pain and neck pain.	Factory workers	• Routine Medical check-up for factory workers • Provision of comfortable work chair with better siting posture and environment • Provision and enforcement in the use of PPE. • Ensure routine breaks in-between work to stretch out stiff body parts.	Number of reported work related health issues. Number of Grievances reported	Employee Health records Employee welfare records	Throughout the operation phase	DAI factory Manager	DAI HSE manager
Cashew kernel Grading	• Postural stress including back pain, stiff neck, strain on eye muscles, muscular	Factory workers	• Routine Medical check-up for factory workers • Provision of comfortable work chair with better siting posture and	Number of reported work related health issues.	Employee Health records	Throughout the operation phase	DAI factory Manager	DAI HSE manager

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency & Responsibility
	discomforts, shoulder pain and neck pain. • Risk respiratory disorder from increased temperature and poor ventilation within the factory.		environment • Provision and enforcement in the use of PPE. • Ensure routine breaks in-between work to stretch out stiff body parts.	Number of Grievances reported	Employee welfare records			
Impact on road traffic								
Transport of finished cashew kernel	Road traffic impact	Local people, road infrastructures	Application of the company's road safety policy to operator and contractor vehicles;	Monitoring of all travel & movement of trailers associated with the Project	Daily reports from the HSE manager	Throughout the operationphase	Admin Manager & Third party driver	DAI HSE manager
Social Impact								
Community investment	Health and education infrastructures, local businesses	Local communities	• Involve the communities and local authorities when constructing basic infrastructure or implementing development projects to identify their exact needs • Ensure transparency when assigning project funding to local institutions' budgets; as part of DAI's community investment strategy, project investment	Number of community investment projects	Quarterly community investment reports	Throughout operation phase	DAI Admin & Financial Manager	DAI management

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency & Responsibility
			should be maximized in the health sector; • Supporting for smallholder farmers with farming equipment, seedlings and training, to ensure the quality of cashew nut supplied meets the DAI's requirements and enable farmers to take advantage of the economic opportunities created from the Cashew-nut processing plant operation.					
Employment of local labour	Local employment (positive impact)	Local people and employees	• Ensure that the recruitment policy is well defined and advertised and that job offers are published at local level. • Local procedure for jobs to be established in agreement with the authorities.	Number of local workers	Recruitment plan / policy	Throughout the operational phase	DAI factory Manager	DAI HR manager
Employment of female causal workers	Local employment (positive impact)	Causal workers (woman)	• Increase local income for women • Increased employment opportunities for female causal workers • Improvement in gender parity.	Employment record of women in the factory operation	Recruitment plan / policy	Throughout the operational phase	DAI factory Manager	DAI HR manager
Child labour	Increased potential for	Local communities,	Prevention of Child labour through implementation of	Number of underaged	Monthly reports from	Throughout the operation phase	DAI factory Manager	DAI HSE & HR manager

Activity/ Source	Potential Impact	Impact Receptors	Mitigation Measures	Verifiable Monitoring Indicators (OVI)	Means of Verification (MV)	Timetable for Implementation	Implementation Responsibility	Internal Monitoring frequency & Responsibility
	Child labour	employees	Child right and awareness campaigns	workers involved in the construction works.	the community liaison officer			

6.2.3 Mitigation measures during Decommissioning and Closure phase

Proposed mitigation/ enhancement measures to manage potential impacts during the decommissioning and closure phase of the project are presented below. It is recognised that closure of the cashew-nut processing plant will take place progressively.

Environmental Impact	Proposed Mitigation / enhancement measures
Impact to climate change associated with GHG emissions.	• Monitor and report fuel, oil, and lubricant usage from supply to individual source (generator, vehicle, and equipment).
Impact to human health associated with air pollutant emissions during decommissioning	• Continuous implementation of grievance mechanism to create awareness to community on grievance procedure;
Spread and/or establishment of alien invasive species	• Compilation and implementation of an alien and invasive species management plan; • Rehabilitation of the disturbed areas in the project area. • Topsoil to be restored and disturbed area re-vegetated with indigenous species.
Displacement, direct mortalities and disturbance of faunal community due to habitat loss and disturbances.	•Training of workers on sensitivity of faunal species and measures to deal with any species encountered during the decommissioning process. •The intentional killing of any animals including snakes, lizards, birds or other animals should be strictly prohibited; •Enforcement of no trapping, killing or poisoning of any wildlife is to be allowed on site; •Compilation and implementation of Erosion and Sediment Control plan; and •Progressive rehabilitation to reduce the impact of erosion long term.
Degradation of drainage lines and associated riparian habitat and related ecosystem	• Compilation and implementation of storm water management plan;

services provided	• No "non-essential" vehicles or activities, dumping or clearing within the delineated watercourses;
Degradation of soil resources	• Utilize topsoil in rehabilitation; • Re-vegetation with indigenous vegetation.
Reduced household income from decommissioning	• An IFC compliant decommissioning and closure retrenchment plan, which includes measures related to livelihood restoration and creating community independence. Such a plan needs to be developed with the involvement of the villages and must include a comprehensive stakeholder strategy and disclosure phase.
Potential water and soil pollution as a result of inappropriate waste management practices including spillages of hazardous materials	• Implementation of Management Measures provided for during the Construction Phase of the Waste Management Plan based on the framework provided • Implement Site Specific Closure and Rehabilitation Plan.
Chemical contamination of surface water resulting from accidental spills during transportation and handling, and seepage from waste	• Implement Waste Management Plan based on the framework provided. • Where contaminants are transported, emergency contaminant and mitigation measures must be developed to minimise impacts should accidental spillages occur along the transport routes; • Store all potential sources of contamination in secure facilities with appropriate Storm Water management systems in place to ensure that contaminants are not released to the water resource through Storm Water runoff.
Sedimentation of surface water resulting from erosion and runoff from exposed surfaces and roads	• Minimize disturbance of soil and vegetation; • Implement rehabilitation and re-vegetation as soon as possible.
Contamination of groundwater resulting from	• Manage waste in accordance with the Waste

seepage from hazardous materials and waste	Management Plan based on the framework provided.

6.4 DAI Organizational Structure

Diaoune Agro-Industrie is a subsidiary of Diaoune et Frères Sarl, established in Côte d'Ivoire in 2004. Diaoune Agro-Industrie Sarl, is a registered agro-processing company in Guinea, engaging in various activities in the cashew value chain, which includes sourcing and processing of raw cashew as well as export of cashew kernel. The company's organogram defining the DAI cashew-nut processing Plant is as presented in Figure below.

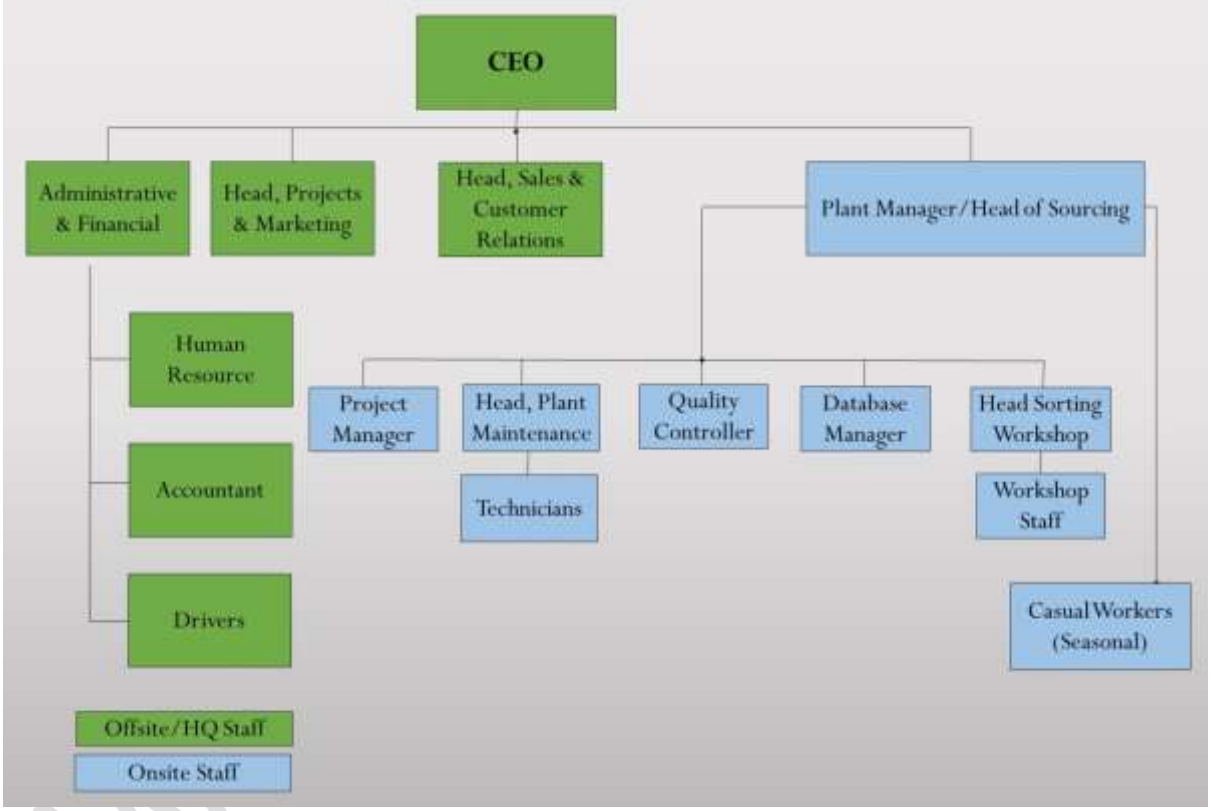


Figure 6.1: DAI organisational structure
Source: DAI, 2022

6.5 Environmental Management Plans/Framework

Environmental Management Plan Main Themed Procedures

As part of the ESIA update, DAI has developed series of environmental and social management 'frameworks/plans. In addition to the mitigation plan presented above, the following themed environmental management procedures are to be planned:

- waste management;;
- Environmental emergency response plan and

- Periodic for audit and review of the ESMP.

The essential principles of these procedures are defined in the following sections.

These procedures shall be integrated into the cashew-nut processing plant's environmental management system. They will be designed to be adaptable to the various Project phases, in order to remain relevant to the specific issues arising in each phase.

Other procedures relating to the safety of installations and associated industrial risks will also be implemented through the cashew-nut processing plant and IOP (Internal Operation Plan). Specific procedures relating to worker health and safety will also be planned.

6.5.1 Emergency Response Plan

The purpose of emergency procedures is to document, and test, the site's contingency plans that cover all potential accidents and incidents during both construction and operation. Specific emergency procedures are required during construction operation and it is DAI's responsibility to ensure that these are developed and implemented. This section therefore outlines some key requirements and these procedures must determine the response to incidents at the DAI cashew-nut processing plant, and address scenarios such as accidents, fires, personnel injury or rescues. Training programmes will be required to ensure an appropriate response in case of accidental events.

A major emergency is one which has the potential to cause serious injury or loss of life. It may cause extensive damage to property and serious disruption. It would normally require the assistance of emergency services to handle it effectively.

The overall objectives of the Emergency Response Plan must be to:

- Localize the emergency and eliminate it; and
- Minimize the effects of the accident on people and property.

Elimination of the emergency will require prompt action by operations and works emergency staff using, for example, fire-fighting equipment, water sprays, etc. Minimizing the effects of the emergency may include rescue, first aid, evacuation, rehabilitation and giving information promptly to people living nearby.

An Emergency Response Plan for the cashew-nut processing plant is necessarily a combination of various actions which are to be taken in a very short time but in a pre-set sequence to deal effectively and efficiently with any disaster, emergency, or major accident with an aim to keep the loss of life, material, plant/machinery etc. to the minimum.

The Emergency Response Plan should include the following:

- Identification of the various types of potential disaster scenarios;

- Identification of the various groups, agencies, departments etc. necessary for dealing with a specific disaster scenario effectively;
- Preparation – by intensive training of relevant teams/groups within the organization to deal with a specific disaster and keep them in readiness;
- Establishment of an early detection system for potential disasters;
- Development of a reliable and instant information/communication system; and
- Organisation and mobilisation of all the concerned departments/ organisations /groups and agencies instantly when needed.

6.5.2 Waste Management Framework

This framework provides the overall guidance for a detailed, functional Waste Management Plan (WMP) which will be developed by DAI and implemented for the proposed operations on the factory.

The main objective of the waste management framework is WMP is to ensure proper and efficient management of waste so as to avoid impacts, and where impacts cannot be avoided, minimize the significance of the negative impacts associated with waste. Other objectives of the WMP will be:

- Identification and classification of waste into different waste classes;
- To ensure that waste management is performed in accordance with Guinean legal requirements, the WBG/IFC EHS standards and guidelines, and Good International Industry Practice (GIIP);
- Define a waste hierarchy and waste minimization strategy to waste management (i.e. waste avoidance, reduction at source, reuse, recycling, treatment stabilization, and responsible disposal);
- Define procedures for waste handling (i.e. collection, segregation, treatment, storage, transport, disposal and documentation);
- The proactive identification and management of potential risks of waste management activities to the environment, people and operations. The risk may be eliminated, or controlled at source, or minimised thereafter and then monitored;
- To promote environmental awareness in order to increase and encourage the application of the waste management hierarchy;
- To ensure the safe transportation, handling, storage, and disposal of wastes;
- To provide appropriate training for staff and other stakeholders on waste management issues;

- To operate waste infrastructure in a manner which will allow for progressive decommissioning of infrastructure at capacity, thereby minimizing the closure liability at the end of the Cashew-nut production plant;
- Monitoring, verification and reporting of wastes.

The objective is to develop a WMP, using a cradle-to-grave approach, that incorporates appropriate, feasible, affordable and an environment-friendly mix of solutions which will continually reduce the mass of waste requiring recovery and/or treatment and disposal, emission into the environment (to atmospheric, land and water resources), and also serve to provide a dynamic framework to manage the DAI waste effectively, based on the waste hierarchy.

The WMP will focus on addressing the management of all wastes generated within the DAI area. The WMP must specifically:

- Improve the coordination of waste management measures, activities and facilities on-site;
- Improve the understanding, and communication, of waste management initiatives of DAI amongst its employees and Stakeholders;
- Reduce the volumes of waste requiring disposal to landfill;
- Segregate waste streams at source where possible to make them more available for reuse and/or recycling;
- Reduce the potential for adverse environmental and health impacts on the DAI employees, surrounding community and immediate biophysical environment;
- Reduce the potential liabilities accruing on closure of DAI, and
- Ensure the waste management on-site, and the off-site management of DAI wastes complies with Company and legislative requirements and has appropriate resources to achieve such compliance.

Waste Streams

The development of a WMP for the factory would therefore require a study to identify current waste streams and quantities covering solid, liquid, hazardous and non-hazardous waste, for all activities. Anticipated waste streams for the construction and operation of cashew-nut processing plant are outlined below.

This waste study will be used to adequately design and size a proposed waste segregation and storage area(s), and inform the type, size and number of waste processing equipment that will be required to be procured and installed.

Wastes are categorized as inert, non-hazardous or hazardous depending on their toxicity; and, are therefore required to be managed and treated accordingly. The following waste categories are identified:

- Inert waste is any waste unaffected by any significant physical, chemical, or biological modifications, which does not decompose, burn, or produce any physical or chemical reaction, is not biodegradable and does not damage any substance with which it comes into contact in a manner likely to cause damage to the environment or human health. This includes non- degradable, non-leaching and non-reactive material such as clean stone, gravel, spoil, concrete, bricks, etc.;
- Non-hazardous waste is waste that is neither hazardous, nor inert, nor wastewater. Non- hazardous waste does not have inherently harmful properties nor pose an immediate threat to health, safety and/or the environment. Examples are, but not limited to, domestic/kitchen waste, paper, cardboard, packing materials, scrap metal, rubble, timber, and plastic, etc.;
- Hazardous wastes are those that exhibit one or more of the following inherent characteristics:
    - Ignitability (flammable, highly flammable or explosive);
    - Reactivity (corrosive, oxidizing); and Biologically harmful (toxic or eco-toxic, infectious, irritant, carcinogenic, mutagenic, teratogenic). Examples of hazardous waste are oils and hydrocarbon based lubricants, oil-contaminated rags, filters, degreasing agents, fluorescent tubes, batteries, electronic waste, ink cartridges, contaminated soil etc.,
    - Medical waste (including sharps, syringes, needles, dressings, and surplus medicines) is a sub- category of hazardous waste that is associated with causing biological harm.

Appropriate technologies, including use of special fit for purpose containers, segregation at source and appropriate handling and storage procedures apply to hazardous waste. Similarly, the treatment and disposal of biological and medical wastes requires special precautions and waste management technologies.

Solid Waste

It is anticipated that the following solid waste streams will be generated during the Construction Phase:

- Vegetation cleared during construction activities;

- Construction waste - waste from the construction process such as excess, damaged or spilled construction materials, packaging from materials:
    - Electrical cable and plastic fittings from electrical wiring work;
    - Pipework off-cuts;
    - Grease, tyres, waste oils and obsolete parts from vehicle maintenance;
    - Waste material from road maintenance;
    - Spent process chemicals used during construction;
    - Spent non-hazardous chemicals, including herbicides, pesticides, and their containers;
    - Waste from the construction process such as excess, damaged, or spilled construction materials (building rubble), packaging from materials;
- Domestic waste - waste from the construction labour force, especially the expatriates accommodated at the construction camp on site:
    - Putrescible waste from construction camp and catering facilities;
    - Glass/bottles;
    - Plastic, Used paper, cardboard, wooden pallets, and polystyrene from packaging of goods delivered to site;
    - Steel and plastic drums/containers from packaging of goods delivered to site;
    - Rubble, rubber wood and metal off-cuts from the construction of buildings/other infrastructure;

Effluent and Storm water

Liquid waste generated during the construction, operational and decommissioning phases of the project includes sanitary and industrial wastewater and waste oil. Wastewater will be generated mainly from sanitary facilities at the plant such as the ablution facilities and from cleaning of floors, other surfaces, tools and equipment such as motor vehicles.

General Impact and Risk Avoidance Control Measures

The DAI cashew-nut processing plant Project will apply a waste management hierarchy of avoidance and reduction of waste in the first instance, followed by reuse and recycling with treatment and disposal being the least preferred option. The desired outcome of waste management plan is to turn this on its head, meaning waste should be prevented, minimised, re-used or recycled. Disposal to landfill must be the last option.

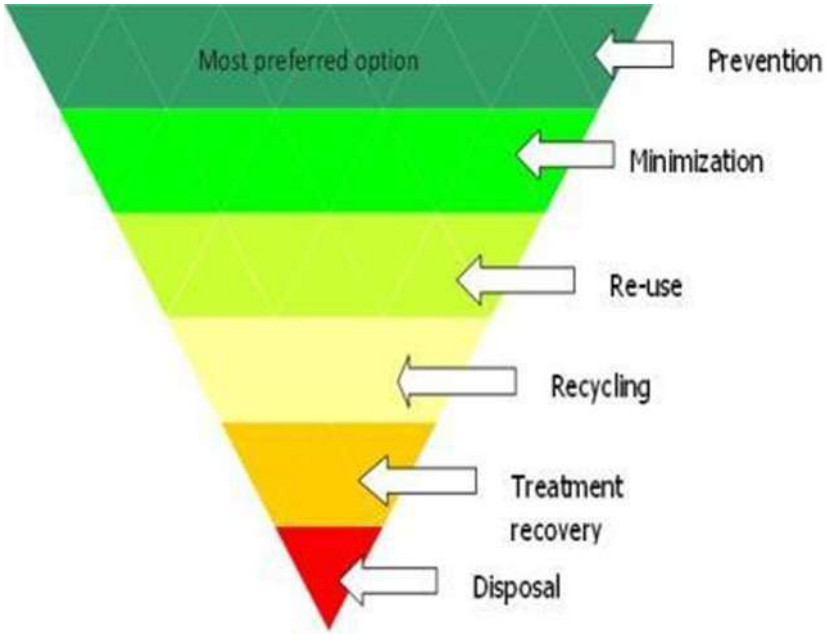


Figure 6.2: Waste Hierarchy Diagram 1

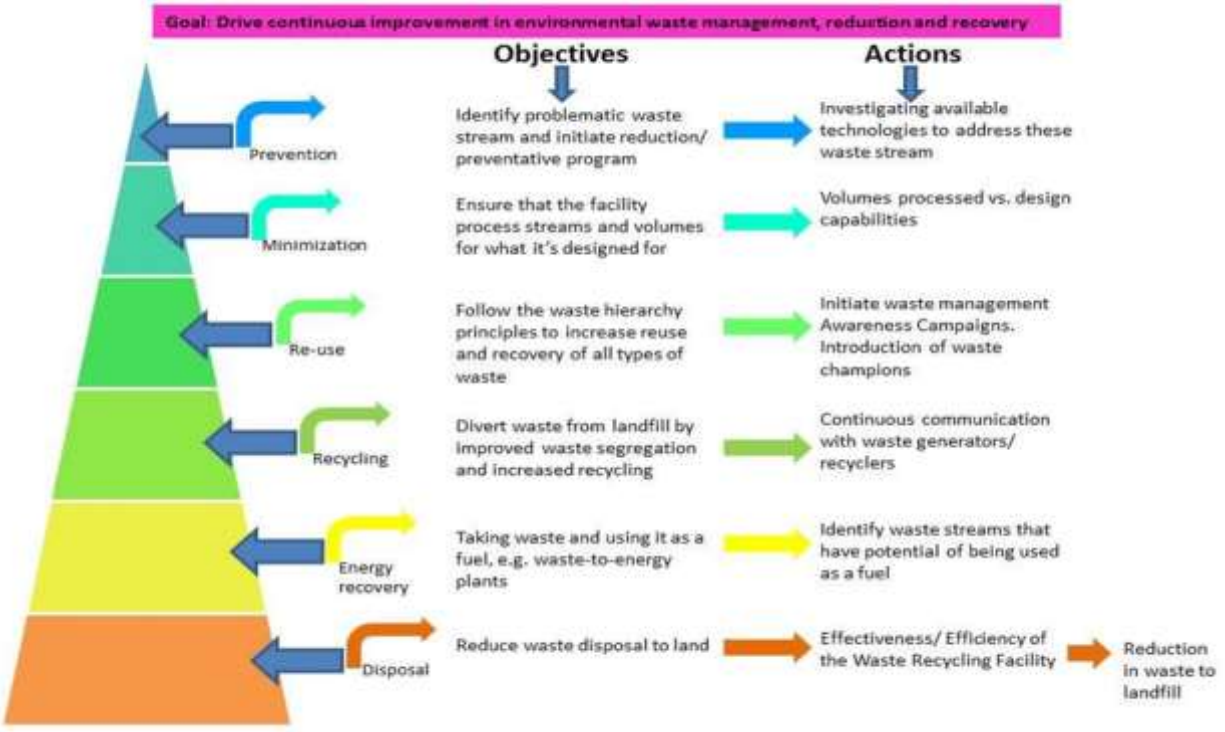


Figure 6.3: Waste Hierarchy Diagram 2

General Provisions

The availability of waste contractors and waste treatment and/or disposal facilities that would meet WB/IFC Environmental Health and Safety (EHS) standards and EHS guidelines. In order to meet these standards DAI may need to be largely self-sufficient in waste management.

Where licensed third-party waste contractor and/or facilities are available, these must be assessed via a documented assessment which should be undertaken to verify that the regulatory, environmental, social and safety measures are appropriate for the type of waste being considered and are compliant to IFC and WB standards and EHS guidelines. This assessment will require Lender approval prior to use. Similarly, where wastes are transferred to a compliant facility, the principle of duty of care applies and the transfer of wastes must be tracked via the use of Waste Transfer Notes and will be subject to formal audits by Lenders and independent auditors.

DAI must prepare a waste study to identify predicted waste streams and quantities covering solid, liquid, hazardous and non-hazardous waste, for all activities, including construction works and worker facilities and accommodation. This waste study must be used to adequately design and size a waste segregation and storage area, and confirm the type, size and number of waste processing equipment that will be required to be procured and installed.

Waste avoidance and minimisation

The potential for waste generation will be considered at the early stage of materials selection. Materials used during construction must be reviewed periodically to evaluate opportunities for waste avoidance and minimisation, including identifying waste streams that could be segregated for re-use or recycling (e.g. packaging wood for reuse in project construction, and plastic bottles, cardboard/paper or metal for recycling). These reviews should be documented into management reports.

DAI must not release waste materials to individuals or entities other than licensed waste management service providers, without having first conducted a documented assessment of the risks posed by the waste (e.g. plywood cannot be used by local community members as a source of firewood due to toxic fumes).

Waste segregation and collection: Non-hazardous waste

Non-hazardous wastes should be separated at source into labelled bins that are covered and fit for purpose. Waste bins must be made available across the site and waste skips at the worksite. Colour coding should be utilised for the waste bins/skips of the different non-hazardous waste streams.

Waste collection points must be distributed at strategic points throughout the site. All waste collection points must be provided with enough waste bins/skips based on the projected amount of waste that is anticipated to be generated. At each waste collection point colour coded and clearly labelled waste bins or skips should be made available to be able to segregate waste at source. The labelled and colour coded bins and skips should be inspected on a weekly basis to ensure there are sufficient bins/skips (no over-spilling of waste), that

waste is being adequately segregated, and that the labels are clear and visible. Waste segregation must be an integral part of the employee induction training and should be regularly reinforced during toolbox talks.

The contents of the waste bins must be collected periodically (on a daily basis for food or food contaminated waste) and transferred to a waste segregation and storage area.

Waste segregation and collection: Food waste and food contaminated waste

Every effort must be made to ensure that food waste is segregated at source. Kitchen personal must be trained and regularly reminded via toolbox talks on the importance of segregated food waste. The kitchen supervisor will be responsible to ensure that food waste is not contaminated with any other waste stream. The waste skips containing food waste should be transferred to a waste segregation and storage area three times a day (after breakfast, after lunch and after dinner). No food waste is to be reused. Kitchens should be fitted with fit for purpose food waste collection points (concrete hard standing, enclosed but with adequate ventilation i.e. mosquito mesh to avoid attracting vermin) for temporary storage of food waste prior to transfer to a waste segregation and storage area. The food waste collection hard standing must be drained to a grease separator, so that it can be adequately washed at the end of each day. Similarly, if packed lunches are distributed to the worksite, this must be done in a manner where food contaminated waste is avoided (e.g. by use of re-usable containers) or by use of biodegradable packaging (e.g. cardboard, paper).

Waste segregation and collection: Hazardous waste

Hazardous waste must be separated at source at designated hazardous waste collection points, which enable appropriate segregation and storage of this waste stream in compliance with waste compatibility requirements. The hazardous waste collection points must be within hard standing, bunded and roofed areas to prevent release to the environment. The hazardous waste bins will be transferred periodically to a waste segregation and storage area. Hazardous waste should be segregated into three main categories, but a compatibility review must be undertaken, and all hazardous waste bins must be clearly labelled to ensure incompatible hazardous waste streams that could react against each other are avoided.

Waste segregation and collection: Waste Segregation and Storage Area

Wastes received at the Waste Segregation and Storage Area must be verified and documented upon receipt in accordance with a waste acceptance protocol that should be developed as part of the Waste Study. Wastes must be screened to determine if segregation is adequate. Where this is not the case, waste must be segregated prior to the waste being weighed and recorded.

Where appropriate, Material Safety Data Sheets (MSDS) must be readily available for all waste types stored here.

The Waste Segregation and Storage Area must have restricted access and separate areas for storage of non-hazardous and hazardous wastes. Separate areas to receive and segregate non-hazardous and hazardous waste must be available. Both the segregation and storage areas must have a concrete surface and be under roof. The segregation and storage areas must be positioned in a manner that facilitates subsequent management of the waste (reuse, recycling, recovery, treatment and disposal).

A fit for purpose food waste receiving area that is on hard standing, enclosed but with adequate ventilation i.e. mosquito mesh to avoid attracting vermin, must be designated for the temporary storage of food waste before it can be removed, or be composted or otherwise treated. The concrete floor must drain to a grease separator, so that it can be adequately washed at the end of each day.

For hazardous wastes special care must be taken so that hazardous wastes are sored separately and in compliance with compatibility requirements. Appropriate containment and secondary, to prevent release to the environment, must be provided.

Induction and regular refresher training must be provided to personnel who deal with hazardous waste so that they understand the health and safety requirements of working with hazardous wastes and the consequences of a failure to contain hazardous wastes. Only those who have received hazardous waste training and have the appropriate PPE will be allowed to handle hazardous waste. Adequate ventilation where volatile wastes are stored must be provided. All containers must be fit for purpose and appropriately labelled along with information on chemical compatibility.

Medical waste must be stored within clearly labelled bio-hazard waste containers that avoid any handling or re-packaging and in a manner that enables it to be incinerated without further handling (i.e. commercially available single use plastic lined cardboard medical bio-hazardous waste containers).

An inventory of wastes (from generation to disposal) must be maintained in a register that will be regularly updated and submitted as part of the monthly reports. The register must describe and categorize each type of waste and set out provisions for its management. It shall also include a waste record section that describes the quantities of waste generated, stored and disposal methodology for each waste stream.

Waste reuse, recycling and recovery

In accordance with the waste minimization and management hierarchy, wastes must be preferentially reused, recycled or recovered.

Waste treatment and disposal

Wastes that cannot be reused, recycled and/or recovered must be treated and disposed of at facilities specifically designed for that purpose, and meeting Guinea and WB/IFC standards.

- Organic waste (e.g. food waste) that is putrescible and therefore cannot be stored will require to be treated on a daily basis. Industrial composters, food dryers and/or incineration should be used to treat putrescible waste. Composting is considered BAT (best available technology) as it is energy efficient and once food is composted it can be used to enrich soils.
- Recyclable waste should be transported to the closest recyclable centre when sufficient quantities have been accumulated to make the transportation worthwhile. Waste recycling centres used should be subject to an ESHS assessment by DAI to determine whether waste is recycled in an environmentally acceptable manner;
- Hazardous waste should be recycled where possible e.g. used oil and lubricants will be sent back to suppliers or will be used as fuel on site;
- Unused and left-over chemicals must be returned to the suppliers whenever possible.
- Bio-hazardous waste (medical waste) must be incinerated in the kiln when the kiln is operating at a steady state.

In the event that a hazardous waste stream will need to be exported to a purposely built and designed hazardous landfills or industrial hazardous incineration facilities. Applicable provisions of the Basel Convention on the Control of Trans-boundary Movements of Hazardous Wastes and their Disposal must then be followed, and an internationally recognized waste management and transportation vendor must be contracted to safely package, transport and track the hazardous waste to final destination.

DAIs overall philosophy is to avoid and minimise solid waste generation where possible. As such it must therefore consider returning products to suppliers where practical, reducing volumes by use of waste processing equipment, recycling waste, treatment and reuse of waste by use of composters (for organic non-hazardous waste) and incineration (for hazardous and bio-hazardous waste).

Where disposal is the only feasible option available for a particular waste stream, and where no suitable (i.e. compliant with Guinean legislation and WB/IFC EHS guidelines) disposal facility is available, DAI may consider the construction of an engineered sanitary landfill complaint with WB/IFC EHS guidelines.

A sanitary landfill is intended to receive non-hazardous wastes. The siting and design of a landfill will be subject to an ESIA and will need to be licensed. An engineering design and operational procedures will also be required. Its location will need to be determined based on

existent ground conditions with special consideration to groundwater, surface water, drainage, secure access and surrounding environmental sensitivities.

Wastewater (sanitary effluents)

A wastewater treatment plant (WWTP) vendor must be contracted to design, install, commission, operate and maintain a WWTP at the Plant. The treated effluent must meet the discharge standards for wastewater effluents. The current practice of using soak aways poses an increasing risk to drinking water in and around the Plant and as such should be discontinued. As a minimum, conservancy tanks should be installed, and sanitary effluent should be directed to a municipal WWTP.

6.5.3 Stakeholders Engagement Plan

A summary of the relevant Performance Standard requirements and objectives of the SEP is provided below.

Under PS 1 (Paragraph 26), the IFC encourages developers to develop an SEP that is scaled to the project risks and impacts and development stage and be tailored to the characteristics and interests of the affected communities" (IFC, 2012: p. 7). The IFC defines stakeholder engagement as a broad, yet inclusive on-going process intended for developers to interact with their key stakeholders, Project Affected Communities and interested groups. The intention is for such engagements to be continuous throughout the lifecycle of a project, and to consider the interests and/or concerns of those who are most directly affected by it. Such interest or concern might be the stakeholder's ability to influence decisions. Above all, stakeholder engagement is a long-term vision that needs to be managed as a "business" and should have a well-defined strategy, a clear set of objectives, a timeline and a budget.

The key objectives of the SEP are to:

- Inform stakeholders of construction activities and health and safety considerations and possible socio-economic and/or environmental impacts to be aware of;
- Establish and build trust between DAI and its stakeholders;
- Develop a deeper understanding of the socio-economic and environmental issues faced by the stakeholders of the project through a grievance procedure and transparent communication mechanism.
- Identify, profile, and analyse the most direct Project-Affected Communities (PACs) and classify them by their interest in the project. This includes the identification of vulnerable, marginalised and/or disadvantaged groups in the society who may be particularly vulnerable to adverse impacts from the project, or simply under-represented;

- Assist DAI to plan proactive and timeous stakeholder engagement activities based on the needs of its stakeholders and their level of interest in the project;
- Promote early detection in terms of negative stakeholder and stakeholder perceptions of the project to prevent or minimise stakeholder activism, such as protests and/or unrest which could affect the operation of the project;
- Create rapport among stakeholders and regularly provide them with project-related information, strategies and awareness in a language and form which are clearly understood. This should also allow such stakeholders to make informed decisions that affect their livelihoods and to be part of decision-making (especially with impacts that affect them negatively);
- Communicate important project-related information or changes in construction or operations activities, new technologies being introduced, or new policies, for example;
- Create project-related partnerships and identify suitable labour or service providers to support
- Ensure that the Community Relations Committees function as an inclusive and participative stakeholder engagement strategy;
- Manage project-related incidents and grievances;
- Manage stakeholder expectations in terms of social investments. This may relate to expectations regarding Corporate Social Investment projects, procurement, and employment opportunities, as well as future development plans; and
- Manage DAI commitments to stakeholders.

6.6 Environmental Monitoring Plan

This environmental monitoring plan considers the issues for which the Project's potential impacts, prior to mitigation, were significant. It aims to evaluate the efficiency of certain environmental measures and possibly to identify impacts which significance is different to those anticipated. An environmental monitoring plan will thus be implemented to enable regular monitoring of the Project's potential impacts, more specifically of ambient air quality, noise levels, liquid effluent, groundwater and soils. The results of these specific measures will be integrated into the environmental annual report of the Project.

It will be carried out either by a specialized external company or internally by Diaoune Agro Industrie SARL technicians. Roles and responsibilities will be specified at the same time as the monitoring and surveillance methods. This plan is summarised in below.

Table 6.5: Environmental and social monitoring plan for the operation phase of the project

Environmental Component	Monitoring Parameters	Reference Location/ Monitoring Point	Monitoring Frequency and Method	Implementing Body	Regulatory Body
Operation					
Air quality	PM_{10} and $PM_{2.5}$	Onsite Offsite –	Continuous.	DAI	BGEEE
	NO_2	At locations established during the baseline assessment located around the plant site.	Monthly.	DAI	BGEEE
	SO_2	At locations established during the baseline assessment located around the plant site.	Bi-Annually (every 6 months)	DAI	BGEEE
Water: Drinking Water Quality	pH, Total Dissolved Solids (TDS), Electrical Conductivity (EC), Dissolved Oxygen (DO), Alkalinity, Total Suspended Solids (TSS), Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Bromine (Br), Chloride (Cl-), Nitrite (NO_2^-), Nitrate (NO_2^- Phosphate (PO_4^{2-}), Calcium (Ca^{2+}), Potassium (K^+), Magnesium (Mg), Iron (Fe^{2+}/Fe^{3+}), Aluminium (Al), Nickel (Ni), Cobalt (Co), Lead (Pb^{2+}), Zinc (Zn), Manganese (Mn), Total Coliform Count, Total Bacteria Count, Faecal Coliform	Point of use (tap that is regularly used in factory office	**Monthly** Sample bottles must be sterilized for the coliform samples; Free chlorine, pH and electrical conductivity must be measured on site; Calcium and Magnesium samples to be taken in borosilicate glass bottles.	DAI	BGEEE
Surface Water Quality	pH, Total Dissolved Solids (TDS), Electrical Conductivity (EC), Dissolved Oxygen (DO), Alkalinity, Total Suspended Solids (TSS), Chemical Oxygen Demand (COD),	Existing Surface Water Sampling Points	Bi-Annually	DAI	BGEEE

Environmental Component	Monitoring Parameters	Reference Location/ Monitoring Point	Monitoring Frequency and Method	Implementing Body	Regulatory Body
	Biological Oxygen Demand (BOD), Bromine (Br), Chloride (Cl-), Nitrite (NO_2^-), Nitrate (NO_3^-), Phosphate (PO_4^{2-}), Calcium (Ca^{2+}), Potassium (K^+), Magnesium (Mg), Iron (Fe^{2+}/Fe^{3+}), Aluminium (Al), Nickel (Ni), Cobalt (Co), Lead (Pb2+), Zinc (Zn), Manganese (Mn), Total Coliform Count, Total Bacteria Count, Faecal Coliform				
Groundwater Quality	pH, Total Dissolved Solids (TDS), Electrical Conductivity (EC), Dissolved Oxygen (DO), Alkalinity, Total Suspended Solids (TSS), TBD (NFU), TH, Chemical Oxygen Demand (COD), Biological Oxygen Demand (BOD), Nitrate (NO_3^-), Phosphate (PO_4^{2-}), Calcium (Ca^{2+}), Magnesium (Mg), Iron (Fe^{2+}/Fe^{3+}), Nickel (Ni), Cobalt (Co), Lead (Pb^{2+}), Zinc (Zn)	Existing Sampling Points	Bi-Annually	DAI	BGEEE
Noise Ambient continuous noise	Noise Level (dBA)	Carried out at representative locations in the sensitized community areas identified in this assessment. This includes the areas occupied by the host communities	Annually. Where possible, especially in villages identified in the predictive noise study as affected receptors, carry out night-time measurements, if not 24-hour surveys. Measure and report 1- hour LAeq levels in accordance with WBG / IFC Guidelines. Use 1-hour or full daytime (07:00 – 22:00) and	DAI	BGEEE

Environmental Component	Monitoring Parameters	Reference Location/ Monitoring Point	Monitoring Frequency and Method	Implementing Body	Regulatory Body
			night-time (22:00 – 07:00) averages for assessment.		
Ecology: Flora and Fauna	Monitoring of Illegal activities.	Entire project area.	Continuous monitoring by regular full-time guards	DAI	BGEEE
Ecosystem Services	monitoring of riparian habitats for signs of disturbance monitoring riparian species richness and abundance	Riparian habitats	Annually, throughout operation	DAI	BGEEE
Waste Management	• Ensure waste is disposed of according to the internationally accepted good practices. • Keep records of all waste and materials.	Ensure that all waste is duly collected, segregated and disposed of according to legal requirements of the country; Keep records of the solid wastes disposed.	Regularly in connection with environmental and safety requirements.	DAI	BGEE E
Traffic	Monitoring roadworthiness of all vehicles (DAI, contractors, and sub-contractors) entering or leaving the site. Monitor speed limits - Monitor and record details of any traffic offences or accidents involving DAI vehicles; and Driver alcohol/drug tests.	At site access control point Random points access roads. To be detailed in accident / incident records At site access control point;	Daily (random inspections of a portion of vehicles) – each vehicle to be inspected at least twice per year; Continuous Daily (random tests of a portion of drivers	DAI	BGEEE
Socio-Economic: Influx management success; Health and safety risks;	Monitoring of migrant population (number, demographics)	Project area	Quarterly counts	DAI	BGEEE

6.7 Reporting and Reviewing Procedures

This section presents the proposed reporting and reviewing procedures for DAI. It is expected that this section will be reviewed by DAI and committed to in the Final ESIA.

Processing Plant Level Reporting: At plant level all the monitored data will be reviewed and scrutinised at the level of Head of Section and on monthly basis by the Plant Manager. The same review of the data will be done twice a year at the level of the CEO. The data will be documented according to the appropriate format at the project level. Where agencies specify a format for reporting, reporting to those agencies will be in the specified format.

Contractor Environmental Reporting: During the construction phase the contractor(s) will report on compliance with the management measures specified in this report, including relevant key performance indicators (KPIs) on a monthly basis. These reports will summarise the key environmental issues in the period and identify any non-conformances and the status of corrective actions.

Emergency Reporting: In the event of an emergency, DAI will as soon as reasonably practicable, and following the implementation of the emergency response plan, report to the BGEE and the IFC. Reporting on emergencies will include:

- the scale and nature of the emergency situation;
- the containment and remedial steps taken, and their effectiveness;
- the root cause and the corrective actions to prevent a recurrence of the emergency; and
- any alterations to the emergency response plan.

Incident reporting: The reporting and investigation of incidents that could have a detrimental impact on human health, the natural environment or property is required so that remedial and preventive steps can be taken to reduce the potential or actual impacts as a result of all such incidents. The actions resulting from any formal or informal investigations will be used to update this ESMP.

Incidents will be reported as soon as reasonably practical by the relevant Head of Section to the Plant Manager. Incident reporting will include:

- the scale and nature of the incident;
- the root cause; and
- the corrective actions to prevent similar incidents occurring in the future.

ESMP Reporting and monitoring requirements will include:

- Monthly inspections and audits;

- Quarterly summary report of accidents/incidents; and
- Annual reporting on training.

Transportation monitoring reporting procedures shall be as follows:

- During construction the Contractor will report monthly to the Plant Manager: HS&E on the:
    - Quality of access roads; and
    - Number and size of trucks used.
- **The Plant Manager:** HS&E shall inspect the condition of areas on monthly basis and shall maintain appropriate records. The inspection shall include:
    - Road conditions in and around the main access routes to the plant
    - Driver orientation / training; and
    - Maintenance and mechanical inspection records for all DAI vehicles.

All trucks shall be inspected for essential systems prior to each trip. Records will be provided by the fleet manager to the Plant Manager: HS&E who will be responsible for record-keeping.

Monthly Reporting to DAI Cashew-nut Processing Plant General Manager: Regular reporting shall be undertaken via a monthly monitoring report that shall be prepared and submitted by HSE manager to the Plant Manager. Reporting shall include:

- A summary of activities undertaken during the reporting period;
- Any material deviations or non-compliances to this Management Plan;
- Planned activities during the next reporting period;
- Any other issues of concern.

6.8 Training Needs

Technical training that is needed for specific jobs, such as environmental monitoring, or for control of the pollution abatement equipment (e.g., management of the wastewater treatment works, management of CNSL, Cashew shell, kernel waste or boiler effluent), etc. must be identified by the Plant Manager: Human Resources and personnel must be trained accordingly.

In addition to the technical skills and experience that staff requires for their appointed positions, it is generally accepted that Environmental Management Systems benefit from cross-cutting environmental awareness training. The following environmental awareness training will be required for construction activities:

- Every construction worker will receive an induction briefing by the contractors. The briefing shall include:
    - Proposed tasks;
    - Worker and safety awareness;
    - Importance of the use of personal protective equipment and warning notices;
    - Personal hygiene and site sanitation awareness;
    - Waste management practices;
    - Environmental protection concerns and management; and
    - Hazard recognition and incident reporting.
- A weekly environmental and safety awareness forum for construction workers at the project site will be implemented. DAI will be responsible for coordinating these meetings.

For operational activities, DAI will train all personnel workers on safety health and environmental issues using the following means to disseminate information to staff and workers:

- Staff and workers meetings;
- Local area networks and the internet; and
- DAI cashew-nut processing operation's annual bulletins.

The Plant Manager: HS&E will be responsible for charged implementing an on-going environmental training program that includes:

- General promotion of environmental awareness plant;
- Waste Management;
- Specific HS&E training of staff working in sensitive areas;
- Updating of staff on changes to environmental standards; and
- Reporting to staff on the performance against environmental targets.

6.9 Auditing and Management Reviews

The ESMP will be periodically audited and updated to ensure sustainability and continuous improvement throughout the Project, from detailed design phase to operational phase. It is a key component of all management systems, including ISO 14001 and OHSAS 18001.

At corporate level, the ESMP will be reviewed within the context of Diaoune Agro Industrie SARL Project audits, focusing on risk identification, the ESMP, specific HSE standards and objectives and the reporting process for environmental indicators related to the Project. At operational level, a periodic audit program will be drawn up and implemented aiming to

check that the environmental management procedures specified in the ESMP are included in operational procedures, effectively implemented and that their results in terms of improving the environmental efficiency of activities are monitored over time.

Within this context Diaoune Agro Industrie SARL will establish an audit schedule for the environmental management procedures used by sub-contractors involved with the Project, and their environmental performance. To this end all sub- contractors must draw up an internal verification programme, permitting continuous improvement of the ESMP at their level, between each audit.

The primary purposes of the audit programme are to:

- Verify continued conformance with respect to all applicable laws and regulations and to the DAI's internal policies and procedures;
- Confirm the continued existence and efficacy of management systems to ensure compliance and performance; and
- Assist in the identification of actual and/or potential risks.

The benefits of the audit programme are:

- Assistance to management in identifying and prioritizing activities and/or practices that have opportunities for improvement;
- Reduction in risk through identification of areas of concern and triggering of appropriate corrective action; and
- Assistance with benchmarking and measuring improvement in management system performance.

The benefits of the review process are detailed below:

- Assess whether company personnel have complied with policy and procedures using audit reports;
- Review targets, objectives, and environmental performance indicators to establish their continued correctness in the light of changing environmental impacts and concerns, regulatory developments, concerns among interested parties, market pressures, internal changes/organisational activity changes and changes in the environment;
- Determine if targets and objectives are being met;
- Review regulatory compliance and whether EMP requirements have been achieved.
- Determine root causes of systemic non-conformances;

- Determine if the operational controls, procedures, corrective actions, preventative measures and continuous improvement efforts have resulted in enhanced environmental performance;
- Determine if energy efficiencies, accounting practices and information management systems are adequate;
- Determine areas of improvement in organisational structure, staff training, work instructions, processes, pollution prevention programmes, energy utilisation and accounting practices, which may lead to environmental opportunities and increased profit margins;
- Formulate corrective actions and preventative measures as a result of the review of system non- conformance and verify corrective actions are effective and appropriate.

The Plant Manager: HS&E will be tasked with the responsibility for auditing and implementation of environmental and social management measures associated with all phases of the project.

Integration and use of results

The integration of audit and monitoring results will permit periodic evaluation of the relevance and adequate nature of the Project's ESMP. Any change to or adaptation of the ESMP will be the object of written tracking and an update of the checked version of the ESMP. Changes to the ESMP will be communicated to the Project team and their results will be evaluated during the next audits, in a continuous improvement cycle

CHAPTER SEVEN
STAKEHOLDER ENGAGEMENT

7.1 Background to the Project Stakeholder Engagement

The IFC Performance Standard 1, *Assessment and Management of Environmental and Social Risks and Impacts*, includes specific requirements for stakeholder engagement in projects, including external communication and management of grievances (paragraphs 25 to 36). The IFC encourages developers to develop a Stakeholders Engagement Plan (SEP) that is scaled to the project risks and impacts as well as the development stage which is to be tailored to the characteristics and interests of the affected communities (IFC, 2012: p. 7). The IFC defines stakeholder engagement as a broad, yet inclusive ongoing process intended for developers to interact with their key stakeholders, PACs and interested groups. The intention is for such engagements to be continuous throughout the lifecycle of a project, and to consider the interests and/or concerns of those who are most directly affected by it. Stakeholder engagement is a long-term vision that needs to be managed as a "business" and should have a well-defined strategy, a clear set of objectives, a timeline and a budget. PS 1 includes a specific focus on:

- Ensuring that stakeholder engagement addresses relevant stakeholders that may be affected by, or have an interest in, the Project.
- Managing external communication in such a way as to reach relevant stakeholders and facilitate a dialogue between the Project and its stakeholders.
- Tailoring stakeholder engagement to the specifics of the Project and affected communities, ensuring that a locally appropriate, effective approach to disclosure and consultation is implemented.
- Disclosing relevant Project information to help stakeholders understand the risks, impacts and opportunities of the Project, including relevant information on the purpose, nature, scale, duration of the Project, it is possible environmental and social risks and impacts and proposed mitigation, the stakeholder engagement process and the Project's grievance management process.
- Ensuring that consultation is undertaken in a meaningful manner, early in the Project planning phase; that it reaches out to all relevant Project stakeholders; that it is undertaken in a culturally appropriate manner; and that it is documented; that stakeholders are provided with information on the Project to understand how the Project may affect them so that they can express their views on the Project and provide inputs taken into account by the Project.

7.2 Objectives of the Stakeholder Engagement Plan

A project-specific Stakeholder Engagement Plan (SEP) is included in **Appendix XXX**. The SEP provides DAI with an operational guideline for stakeholder engagement for the proposed project operations and ongoing community engagements. The plan aims to offer DAI a means to manage its stakeholder engagement activities as part of a business function; providing a well-defined engagement strategy with clear objectives and responsibilities.

The key objectives of the Stakeholder Engagement Plan (SEP) are to:

- Develop a list of Project stakeholders;
- Define the basis for compliance concerning external stakeholder engagement required as part of the Project;
- Inform stakeholders of construction activities during the construction phase, including health and safety considerations and possible socio-economic and/or environmental impacts to be aware of;
- Establish and build trust between DAI and its stakeholders;
- Develop a deeper understanding of the socio-economic and environmental issues faced by the stakeholders of the project through a grievance procedure and transparent communication mechanism. This should allow DAI to better mitigate potential negative impacts and address any concerns;
- Identify, profile, and analyse the most direct Project-Affected Communities (PACs) and classify them by their interest in the project. This includes the identification of vulnerable, marginalised and/or disadvantaged groups in the society who may be particularly vulnerable to adverse impacts from the project, or simply under-represented;
- Assist DAI to plan proactive and timeous stakeholder engagement activities based on the needs of its stakeholders and their level of interest in the project;
- Promote early detection in terms of negative stakeholder and stakeholder perceptions of the project to prevent or minimise stakeholder activism, such as protests and/or unrest which could affect the operation of the project;
- Create rapport among stakeholders and regularly provide them with project-related information, strategies and awareness in a language and form which are clearly understood. This should also allow such stakeholders to make informed decisions that affect their livelihoods and to be part of decision-making (especially with impacts that affect them negatively);
- Create project-related partnerships and identify suitable labour or service providers

to support (also maximising project-related opportunities);

- Ensure that the Community Relations Committee functions as an inclusive and participative stakeholder engagement strategy;
- Manage project-related incidents and grievances;
- Manage stakeholder expectations in terms of social investments. This may relate to expectations regarding Corporate Social Investment projects, procurement, and employment opportunities, as well as future development plans; and
- Manage DAI commitments to stakeholders.

7.3 Stakeholders Engagement Activities Conducted as Part of ESIA

Following the Guinean regulations on environmental and social impact assessment as well as IFC performance standards, stakeholder engagement activities have been undertaken by Diaoune Agro Industrie SARL as part of the ESIAprocess for the proposed project.

Stakeholder engagements were undertaken in collaboration with the larger project socioeconomic impact assessment and meetings were held at various locations around the Project site between the 3rd and 6th of October, 2022. The objectives of these engagements were to disclose project-related information and obtain issues and/or comments from the stakeholders.

The stakeholder categories engaged include:

- Representatives of the Bureau Guinéen des Etudes et Evaluation Environmental (BGEEE)
- Representatives of local authorities, Boke
- Members of the host community.
- Traditional leaders;
- Representatives of local groups including youth and women groups;
- Representatives of Cashew farmers cooperative society etc.

The project site is located within Boke region of Guinea. The project AoI spans communities within Boke (where the project site is) and seven (7) communities were considered and consulted as part of stakeholders engagement for this project namely; Katabe, Fodeconteah, Tambobo, Tambouni, Kataba-Foulatah, Karika Medina and Tamaransy. Attendance lists during the meetings are provided in Annex X.

The key stakeholders' feedback, concerns and expectations are summarised in Table 7.1.

Table 7.1: Summary of stakeholders' feedback, concerns and expectations

Category	Stakeholder comments and feedback
Key concerns	
Stakeholders Engagement	• Community members express doubt if the project stakeholders' engagement will be sustained to provide an opportunity for cordial interaction between the company and the community.
Impact of Community Health and Safety	• Community members expressed fears of pollution of their surrounding local streams from wastewater from cashew nut processing. • Stakeholders raised concerns about air pollution from the project
Key expectations	
Infrastructure and development	• Stakeholders expect the project will assist in providing potable water to the communities within the area. • Stakeholders complain about the lack of schools in the communities and expect the project will assist in providing primary and secondary schools. • Stakeholders are happy about the project and expect the project will provide electricity to communities around the project site, • Stakeholder's members expect the project will assist in constructing primary healthcare facilities in surrounding communities.
Local investment and support	• Stakeholders expect the project will fast-track off-taking of raw cashew nuts and boost the income of cashew farmers in the area. • Stakeholders expect the project will encourage buying cashew nuts directly from the local farmers to increase their profit. • Stakeholders expect support from the project in terms of quality seedlings and farming maintenance and machineries. • Stakeholders expect financial support to increase their cash farm capacity and start up new farms for youths.
Employment opportunities	• Stakeholders expect provision for members of the communities especially women and youths in the area. • All stakeholders support the employment of a Community Relations Officer from Kataba (the nearest community to the project site) to coordinate stakeholders' engagement for the project.

7.4 Approach to the Project SEP

The approach of this SEP is to identify all the stakeholders according to their interests in the project. The plan provides an engagement programme for the Pre-Construction, Construction and Operations Phases of the DAI project. An important operational element of the SEP is to establish a Community Relations Committee (CRC) through which all project-related stakeholder engagement activities will be conducted.

7.5 Proposed methods for future Engagement

The Information dissemination will not be limited to the ESIAs and other regulatory processes, as DAI is committed to continuously providing its stakeholders with project-related information through the following proposed methods of engagement:

- Distribution of project documents (info leaflets);
- Emails, SMS and Social media platforms (WhatsApp messages etc);
- General community/Public meetings;
- Company website updates and information sharing;
- CSI reporting; and
- Using CRCs as a communication mechanism through which a Grievance Mechanism should be managed.

7.5 Proposed Stakeholder Engagement Programme

This set out proposed engagement schedules for the following phases of the project:

- Pre-Construction Phase;
- Construction Phase; and
- Operations Phase.

Pre-Construction Phase

This phase largely involved the ESIA and its disclosure as per the IFC PSs (2012) and DFC Office of Accountability (footnote). Disclosure and consultation activities as part of the ESIA disclosure are guided by the following objectives:

- Events and meetings are widely publicised at least one week in advance to all identified stakeholders. Information for consultation meetings disseminated using relevant local forums and procedures which include physical one-on-one distribution of invitation letters and noticeboards;
- Appropriate venues selected to ensure all stakeholders who wish to participate have the opportunity to do so;
- All events/meetings conducted in English, French and the indigenous local language

(Susu) with sufficient opportunities provided to stakeholders to provide inputs, and/or express concerns/issues;

- Each event/meeting is followed up using meeting minutes;
- Issues and/or concerns raised during these events/meetings are actively followed up by DAI in a timeous manner. Should DAI not be able to resolve/provide answers to such issues/concerns during events/meetings, stakeholders are informed as to when and how they can expect feedback in this regard.

Construction Phase

The objectives of stakeholder engagement during the Construction Phase are to:

- Minimise community and occupational health and safety-related impacts;
- Manage contractors; and
- Deal with grievances.

DAI, together with the construction contractor will be responsible to ensure that stakeholder engagement activities continue throughout this phase.

Operations Phase

The objectives of stakeholder engagement during the Operations Phase are to:

- Minimise community and occupational health and safety-related impacts during the operation of the project;
- Improve the socio-economic living conditions of the DAI PACs and stakeholders within the project AoI;
- Promote socio-economic development in the project AoI;
- Inform the development and update of DAI's community development approach; and
- Deal with grievances.

DAI will be responsible to ensure that stakeholder engagement activities continue throughout this phase.

7.3 Grievance Mechanism

This section summarises the Grievance Mechanism presented in the SEP (Appendix X). It provides an external Grievance Mechanism to be adopted and implemented by DAI. The establishment of a grievance management system is a widely accepted international best practice for the management of stakeholder interactions andsocial impacts. It is a requirement of the IFC Performance Standards and project lenders in this case DFC.

The Grievance Redress Mechanism provides a clear description of the formal process whereby

stakeholders can submit a grievance or report an incident regarding the DAI project, through a defined process within a predictable timeframe and receive a response and a resolution (where possible) to the grievance. This process should be adhered to by DAI management upon receipt of a stakeholder complaint.

In accordance with international good practice, DAI will establish a specific mechanism for dealing with grievances that do not involve court action. It includes the following steps:

- Receive and register the complaint or grievance;
- Carry out a preliminary review and categorise the complaint;
- Address the complaint; and
- Close the complaint.

Furthermore, as per DFC Office of Accountability requirements, stakeholders are encouraged to seek redress to any grievance related to the project by;

- Discussing concerns with the DAI staff representative in charge of handling project stakeholder grievances. Stakeholders are encouraged to first register their concerns to DAI.
- Contacting local government representatives within the project area (Boke region).
- Contacting DFC's the environment/social unit by email address as circulated during consultation meetings.
- Contacting DFC's Office of Accountability (OA), which is saddled with the responsibility of assisting project-affected people and companies in resolving concerns and disputes that arise around the projects that DFC supports.

Objectives and Scope of Grievance Mechanism

This grievance management system provides a formal way to register stakeholders' concerns to be addressed in good faith and through a transparent and impartial process.

This mechanism aims to:

- Ensure that unwanted events with negative impacts on external stakeholders are dealt with swiftly and appropriately;
- Ensure that incidents, complaints and grievances are logged and managed consistently to build trust in the legitimacy and efficiency of the procedure and system;
- Ensure that vulnerable people can log grievances in a non-threatening and accessible way;
- Allow DAI to identify and correct problems before they recur or escalate into more serious problems;

- Allow DAI to monitor and track stakeholder concerns, issues and complaints providing insight into how DAI is perceived by its external stakeholders;
- Provide an efficient and low-cost means of resolving disputes and providing control measures where appropriate; and
- Elevate the credibility and reputation of DAI by efficiently demonstrating that the concerns of external stakeholders are taken seriously.

The mechanism applies to DAI in addressing complaints, grievances and issues voiced by stakeholders due to perceived DAI project impacts and/or incidents including, but not limited to, socio-economic, environmental, health or safety aspects.

7.3.1 Monitoring the Grievance Process

This grievance management system provides a formal way to register stakeholders' concerns and for these to be addressed in good faith and through a transparent and impartial process. Grievances are monitored to provide signals of any escalating conflicts or disputes. The grievance mechanism and its effectiveness must be reviewed by the DAI Community Relations Officer and Management on a bi-annual basis. Depending on the outcome of the review, the mechanism will be amended and disclosed to the CRC in a formal meeting.

7.3.2 Roles and Responsibilities

The CRO will be responsible for the coordination and functioning of the grievance mechanism, investigation and resolution of incidents communicating responses and resolutions to stakeholders. DAI Management will be responsible for assessing the effectiveness of complaint responses, signing off on agreed resolutions, and communicating these to stakeholders.

The DAI General Manager and/or relevant assigned manager(s) will be responsible for investigating stakeholder appeals. All DAI employees will be responsible for understanding the Grievance Mechanism upon which if notified of any complaint, would advise stakeholders of the available channels for grievance submission.

Table 7.2: Roles and Responsibilities

Role	Responsibility
CRC	Receive formal grievance and record in a grievance form to be provided to DAI
CRO	Receive and analyse grievances. Records grievances and responses in an electronic grievance registry.

Role	Responsibility
DAI Managing Director	The grievance committee/CRO shall report the grievances in the registry to the DAI Managing Director every quarter.

REFERENCES

Ahn, P.M. (1970). West African Agriculture. Vol. 1: West African Soils. 3rd ed. Oxford: Oxford University Press. 332 pp.

Cohen, W. B., and Goward, S. N. (2004). Landsat's role in ecological applications of remote sensing. Bio Science, 54(6), 535–545.

Couch C., Magassouba S., Rokni S., Cheek M. (2019). Threatened plants species of Guinea-Conakry: A preliminary checklist. (Not Peer reviewed), Guinea.

Eastman, J. R. (2003). IDRISI Kilimanjaro: guide to GIS and image processing.

EEM (2015). Environmental and Social Impact Assessment report for the Compagnie des Bauxites de Guinée (CBG) Mine Extension Project, Boke, Guinea.

IFC (2012). Guidance Note 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. Guideline. World Bank Group.

IFC (2012b). Performance Standard 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources. [Online]. Available: https://www.ifc.org/wps/wcm/connect/3baf2a6a-2bc5-4174-96c5-eec8085c455f/PS6_English_2012.pdf?MOD=AJPERES&CVID=jxNbLC0 [2022, October 05].

International Union for Conservation of Nature (2012). IUCN Red List Categories and Criteria: Version 3.1. Second edition. Gland, Switzerland and Cambridge, UK.

Meaden, G. J., and Kapetsky, J. M. (1991). Geographical information systems and remote sensing in inland fisheries and aquaculture. Rome: Food and Agriculture Organization of the United Nations.

Schlüter, T. (2006). Geological Atlas of Africa: With Notes on Stratigraphy, Tectonics, Economic Geology, Geohazards and Geosites of Each Country 2nd edn, 307 (Springer-Verlag, 2006).

Soumah, I. (2009). The future of Mining Industry in Guinea. Editions L'Harmattan. ISBN 978–2–296–21573–3.

Stephen A. Irinyemi, Domenico Lombardi & Syed M.Ahmad (2022). Seismic hazard assessment for Guinea, West Africa.

Swartz B. K. (1980). West African Culture Dynamics: Archaeological and Historical Perspectives. Mouton Publishers.

TBC (2021). Biodiversity Action Plan for the operations of Compagnie des Bauxites de Guinée (CBG), Guinea, Version 2 – March 2021, The Biodiversity Consultancy Ltd. Cambridge, UK.

U.S. Agency for International Development (USAID). 2012. Guinea Environmental Threats and Opportunities Assessment. Washington, DC. USAID. 27p. Accessed August 2012.

USAID (2010). Landlinks. Available at *https://www.land-links.org/country-profile/guinea/*

WorldFactbook (2022). Travel the globe with CIA's World Factbook.

Wulder, M. A., Masek, J. G., Cohen, W. B., Loveland, T. R., and Woodcock, C. E. (2012). Opening the archive: How free data has enabled the science and monitoring promise of Landsat. Remote Sensing of Environment, 122, 2–10.

Zhang, R., Gong, E., Wang, G., Peng, W. (2018). Mineralization Patterns and Conditions of Lateritic Gibbsite Bauxite in Guinea. Advances in Geoscience, 2(1).

Citypopulation.de

Wikipedia.

Institut National de la Statistique de Guinée Available at: *https://www.stat-guinee.org*/