

**P171933**

**ENVIRONMENTAL AND SOCIAL IMPACT  
ASSESSMENT (ESIA) FOR PROPOSED CIVIL  
WORKS IN AND AROUND DIGYA NATIONAL PARK**

**Submitted by Environmental Protection Agency (EPA)-  
PCU**

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## LIST OF ABBREVIATIONS

BA	Beneficiary Agency
CDP	Community Development Programme
EA	Environmental Assessment
ESIA	Environmental and Social Impact Assessment
ESMP	Environmental and Social Management Plan
EMS	Environmental Management Systems
EPA	Environmental Protection Agency
ESMF	Environmental and Social Management Framework
HSE	Health, Safety and Environment
EPA	Environmental Protection Agency
GLRSSMP	Ghana Landscape Restoration and Small-Scale Mining Project
GoG	Government of Ghana
I&APs	Interested and Affected Parties
IA	Implementing Agency
MMDAs	Municipal, Metropolitan and Districts Assemblies
DNP	Digya National Park
NGOs	Non-Governmental Organisations
NO <sub>x</sub>	Oxides of Nitrogen
PAD	Project Appraisal Document
PAPs	Project Affected Persons
PCDP	Public Consultation and Disclosure Plan
PDO	Project Development Objectives
PM	Particulate Matter
PIM	Project Implementation Manual
RAP	Resettlement Action Plan
RFP	Request for Proposal
SO <sub>x</sub>	Oxides of Sulphur
WB	World Bank
WD	Wildlife Division

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## EXECUTIVE SUMMARY

### Background

The Environmental Protection Agency (EPA) and the Ministry of Lands and Natural Resources (MLNR) are currently implementing the Ghana Landscape Restoration and Small-Scale Mining Project (GLRSSMP) in support of targeted actions to address land degradation through the promotion of sustainable Integrated Landscape Management (ILM). Under the GLRSSMP, the EPA is responsible for landscape restoration activities while the MLNR is responsible for formalization of Artisanal Small-scale Mining (ASM).

The GLRSSMP is funded by the World Bank / International Development Association credit, with leveraged grant financing from the Global Environment Facility (GEF), the PROGREEN Trust Fund, and the Extractives Global Programmatic Support Trust Fund to upscale and support the Government of Ghana in sustainable land management to address land degradation in Ghana.

### Project Goal, Description and Alternative

The goal of the six-year project is to strengthen integrated natural resource management and increase benefits to communities in targeted savannah and cocoa forest landscapes. The project involves five basic components:

- Component 1. Institutional Strengthening for Participatory Landscape Management.
- Component 2. Enhanced Governance in Support of Sustainable Artisanal Small-Scale Mining
- Component 3: Sustainable Crop and Forest Landscape Management
- Component 4: Project Monitoring and Knowledge Management
- Component 5: Contingency emergency response

The project intends to undertake construction of a number of water systems (i.e., dugouts, mechanised boreholes and water holes), game viewing platforms, toilet facilities, mechanized solar powered borehole, for admitted settlers in the park, cassava mini processing facilities for some fringe communities and safari trails for game viewing, in and around the Digya National Park. The construction of these facilities aims to improve livelihoods of settlers both within and outside the park and contribute to the ecotourism capacity of the park.

Detailed description for each of the civil works has been provided in the report. Alternatives considered include design, site, and no action scenario.



## **Justification for the Sub-Projects**

The development of the civil works in and around the Digya National Park is needed to boost the ecotourism capacity of the park, the second largest and oldest in Ghana, with both blue and green potential. Farmers in the fringe communities are seen as collaborators in managing the park and reducing the exploitation of endangered resources in the park. Therefore, the development of the mini cassava processing facilities will enhance the livelihoods of these fringe communities through reduction of post-harvest losses and promoting value addition to farm produce. The provision of the sanitary facilities for admitted settlers will also enhance the environmental integrity of the park.

## **Objectives of the Assignment**

The main objective of the assignment is to incorporate environmental and social (E&S) /sustainability considerations into the planning, design, construction and implementation of various proposed facilities, identify potential E&S risks and impacts, and propose measures to mitigate them.

## **ESIA Study Methodology**

The approach and methodology for the ESIA study covered the following:

- Site inspections
- Analysis of project alternatives
- Stakeholder identification and consultations
- Desktop study and document/literature review
- Specialist surveys, sampling and data analysis
- Identification and assessment of potential environmental and social risks and impacts
- Development of environmental and social management and monitoring/management plan
- Reporting

## **Policy, Legal, Regulatory and Institutional Framework**

The following are national laws, regulations and policies relevant to the GLRSSMP:

- The Constitution of Ghana, 1992
- Forest and Wildlife Policy (2012)
- Forest Development Master plan (2016 – 2036)
- Ghana Forest and Plantation Strategy (2015-2040)
- Food and Agricultural Sector Development Policy (FASDEP II, 2016)
- Medium Term Agricultural Sector Investment Plan (METASIP, 2011-2016)
- Gender and Agricultural Development Strategy (GADS II, 2023)
- National Climate Change Policy (NCCP 2013)

- National Land Policy (1999)
- Land Act, 2020 (Act 1036)
- Environmental Protection Agency Act, 1994 (Act 490)
- Environmental Assessment Regulations, 1999 (LI 1652)
- National Environmental Policy (2010)
- Forestry Commission Act of 1999 (Act 571)
- Wildlife Resources Management Act, 2023 (Act 1115)
- Land use and Spatial Planning Act, 2016 (Act 925)
- The Labour Act, 2003 (Act 651)
- Children’s Act, 1998 Amended in 2016 (Act 937)
- Workman’s Compensation law, 1987 (PNDCL 187)
- Public Health Act, 2012 (Act 851)
- Ghana Disability Act, 2006 (Act 715)
- Fees and Charges (Miscellaneous Provisions) Act, 2022 (Act 1080)
- Water Resources Commission Act, 1996 (Act 522)
- Water Use Regulations, 2001 (LI 1692)
- Hazardous and Electronic Waste Control and Management Act, 2016 (Act 917)
- Hazardous Electronic and other Waste (Classification), Control and Management Regulations, 2016 (LI2250)

### **National Environmental Standards**

The National Environmental Standards provide for permissible levels for ambient air quality, noise levels and effluent quality standards for discharge into natural water bodies. The environmental standards being adopted for this project include;

- Ghana Standards for Ambient air quality and point source air emissions (GS1236:2019)
- Ghana Standards Environmental Protection - Requirements for Effluent Discharge (GS1212:2019)
- Ghana Standards Health Protection - Requirements for Ambient Noise control (GS1222:2018)

### **Relevant World Bank Environmental and Social Standards**

The World Bank integrates environmental and social considerations into all its investments. to ensure that adverse project risks/impacts are managed appropriately while enhancing the positive impacts. The Bank policy of ‘do no harm’ to the environment has over the years changed into ‘do good’ which presupposes that undertakings ought not to have negative environmental impacts and

at the same time improve the environment through biodiversity management, waste management etc.

The Environmental and Social Framework of the World Bank with its 10 standards set out the requirement for the borrower relating to the identification and assessment of environmental and social risks and impacts associated with the Bank's investment financing of various projects. The ESF rates environmental risk of investment as either high risk, substantial risk, moderate risk or low risk. The proposed project is rated as substantial and therefore requires the preparation of this ESIA. The relevant standards applicable to the project include ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS8, and ESS10.

### **Environmental and Social Baseline**

The proposed civil works are located in and around the Digya National Park, which spans five political/administrative districts (Sene West, Sene East, Sekyere Afram Plains, Kwahu Afram Plains North and Kwahu Afram Plains South).

Digya National Park (DNP) lies largely within the Sene District of the Brong Ahafo Region. It also stretches into the Sekyere West and Afram Districts of the Ashanti and Eastern Regions respectively (Figure 4-1). It is situated between the latitudes 7°06' and 7°44'; North and longitudes 0°06' and 0°42' west and covers an area of 3478.5 km<sup>2</sup>. Three quarters of the DNP is bounded by water; on the north by the Sene River, on the east by the Volta Lake and on the southeast by the Obosum River.

Digya National Park experiences an annual cycle of rainfall that is transitional in nature. The annual rainfall in the 70's from March to October averaged 1375mm, (Happold, 1973). This is comparable to the mean annual rainfall for Atebubu (1269.6mm) and Kete Krachi (1370mm) as recorded by the Meteorological Service Department (DNP Management Plan).

The reserve is underlain geologically by the Voltaian system of late Precambrian to Palaeozoic age (300-1,000 M yrs). The Voltaian sandstone basin is made up of gently dipping or flat-bedded sandstone, shale and mudstone (Dickson and Benneh, 1988).

The Park and the thirty-seven (37) fringe communities within the Digya landscape fall within the jurisdiction of five (5) administrative/political districts namely Sene West, Sene east, Sekyere Afram Plains, Kwahu Afram plains North and Kwahu Afram Plains South.

The major economic activity of the people is farming and Fishing. The settler farmers do most of the commercial crop farming. The type of crops grown is determined by whether the area is forest or savanna land. Forestlands are primarily used to cultivate cash crops like cocoa and oil palm. Plantain and cocoyam are also grown for sale.

Yam is the principal commercial crop grown in savanna lands. Maize, groundnuts and cassava are either cultivated separately or intercropped with yam. The cassava is generally dried into what is locally called "Konkonte" before it is sold. Rice is also grown where appropriate. Pepper, beans, garden eggs, tomatoes and agushie (neri) are usually cultivated by women on their husband's farms for their own benefit.

Within the fishing communities, people of Ewe origin attach a lot of importance to farming of cassava, and the surplus sold to other fisher folks who do not do any farming. Nungos, Efutus and Senyas live by bartering fish for food from those who farm.

### **Citizen/Stakeholder Engagement**

Citizen/Stakeholder engagement activities were carried out as an important aspect of the assessment process to specifically:

- Identify concerns and expectations with the project implementation;
- Assess the degree to which relevant stakeholders could be impacted by the project;
- Dialogue on the main potential E&S constraints and risks requiring mitigation;
- Evaluate mitigation measures and project alternatives with stakeholders; and
- Dialogue on E&S opportunities and other benefits that could be enhanced.

### **Identification of Impacts**

#### **Positive Environmental and Social Impacts**

Among the sub-projects to be constructed, the dugouts, for example will have several positive impacts including employment generation, improved livelihoods through increased production of livestock, as water availability for watering livestock in beneficiary communities will be enhanced. Also, the facilities (viewing platforms, waterholes, camping etc.) to be built in the Digya National Park will enhance the ecotourism capacity of the park.

The potential adverse impacts identified have been summarised in the table below. And to ensure that the potential negative impacts from development of the civil works are adequately managed, appropriate mitigation and enhancement measures for the significant potential adverse impacts have been proposed. These measures i.e. preventive, control and compensatory (section 7.0) have been developed based on the mitigation hierarchy which ensures that potential environmental and social impacts are avoided, reduced or compensated to acceptable levels. These preventive measures will be integrated into the project design at the pre-construction phase

### Summary Risks/Mitigation Table

Risks	Sources	Effects	Mitigation measure	Significance
<b>Loss of habitat and biodiversity</b>	Clearing of land for construction	Ecosystem disturbance	Selective felling Education of workers	Protect and conserve biodiversity
<b>Air and noise Pollution</b>	Excavation during construction and use of Obsolete equipment	Adverse effects on workers and community health	Contractors will be required to regularly service their construction equipment and undertake water dousing to minimise the release of particulate matter and dust pollution	Protect workers and community health
<b>Water contamination</b>	Muddying of nearby streams	Siltation of streams	Implement controlled excavation methods to reduce sediment displacement into water bodies.  Where necessary, create sediment basins or traps to collect runoff and allow sediment to settle before water is discharged	Maintaining and ensuring quality of stream water
<b>Visual intrusion</b>	Open construction sites	Disturbing sights of people passing by the sites	Cordoning -off construction sites	Avoiding visual intrusion
<b>Erosion</b>	Storm water run-off	Development of gullies and siltation	Construction will be phased, to minimize the area of disturbance at any one time, thereby limiting erosion potential	Landscape integrity will be maintained
<b>Fire Hazards</b>	Improper storage of petroleum products for equipment leading to leakages	Harm to workers, equipment and eco-system	Keeping petroleum products in banded and safe area	Maintain safety of workers, equipment and eco-system

	and possible explosions			
<b>Disposal of construction debris</b>	Improper disposal of construction debris	Causing of nuisance to communities	Debris will be deposited at appropriate locations after discussions with Park Management	Avoiding conflict with human and wildlife movements
<b>Transmission of HIV/AIDS and communicable diseases</b>	Labour influx to construction sites	Infection of HIV/Aids &STDs	Education of workers and communities on preventive measures and management strategies	Maintaining health and safety of workers and communities
<b>Gender based violence, child labour and child abuse</b>	Poor sensitisation of workers and project communities on issues of GBV/SEA/SH and child labour and lack of related site policies	Abuses on women and children and engaging minors on construction sites.	Contractors will be obliged to adhere to an established code of conduct enshrined in their operational documents	Human rights of people will be upheld

An Environmental and Social Management Plan (ESMP) has been developed in compliance with the requirements of the Ghana Environmental Assessment Regulations of 1999, (LI 1652), the relevant World Bank Environmental and Social Standards to guide the implementation of the proposed project in an environmentally sound and sustainable manner. The management commitments and the required training programmes for the sustainable implementation of the proposed projects have been presented in the ESMP. An estimated budget for the implementation of the mitigation measures including training and capacity building is indicated below.

No	Activity	Cost/p.a (USD)
1	Implementation of mitigation measures-ESMP (see Table 9-2):	
	<ul style="list-style-type: none"> <li>Construction Phase</li> </ul>	In contractor's fees
	<ul style="list-style-type: none"> <li>Operational Phase</li> </ul>	In project's Environment and safeguard Budget
2	Training and Capacity Building (See Table 9-2)	70,000.00
3	Environmental Auditing and Reporting: Quarterly environmental, health and safety audits Returns of Monitoring Reports to EPA (In compliance with LI 1652)	15,000.00

	Preparation of Environmental and Social Management Plan every 3 years (In compliance with LI 1652)	
4	Environmental and Social Monitoring Plan	50,000.00
5	ESMP and Implementation of Grievance Redress Mechanism (Existing GLRSSM-EPA-PCU Budget)	-
	<b>Total</b>	<b>135,000.00</b>

## Environmental and Social Monitoring Plan

This section presents a detailed Environmental and Social Monitoring Plan (ESMP-Monitoring) to guide the monitoring of the environmental and social impacts and the implementation of mitigation and enhancement measures during the construction and operation phases. The monitoring plan will enable the EPA to confirm the effectiveness or otherwise of the mitigation measures contained in the ESIA and help enhance the effectiveness of the implementation of the mitigation measures.

The monitoring plan includes identification of the responsible institutions or persons and estimated budget/cost requirements.

The ESMP-Monitoring includes social and environmental protection measures/indicators addressing at a minimum:

- Workers’ rights and responsible labour behaviour (including GBV/SEA/SH issues)
- Prevention and identification of child labour
- Induced development, both short term during construction and long term, from the presence of the Project.
- Occupational health and safety requirements for workers.
- Project related incidents such as traffic accidents and risks to public safety.
- Waste management, including construction wastes and hazardous wastes.
- Security issues including material and equipment storage and potential vandalism.
- Removal of vegetation and measures for landscaping.
- Ongoing information disclosure, consultation and engagement in next project phases, and
- Management systems and capacity for implementing them.

## CONCLUSION

The goal of the six-year project is to strengthen integrated natural resource management and increase benefits to communities in targeted savannah and cocoa forest landscapes.

The scope of civil works has been clearly defined under the project, including construction of small-scale ecotourism infrastructure (bird hides/viewing platforms), dugouts/water holes, toilet facilities, solar powered bore holes, processing facilities in and around the DNP. The construction of these infrastructure aims to improve access to water and watering of wild animals and contribute to the development of the Digya National Park while improving the livelihoods of the fringe communities.

The proposed interventions may have both positive and negative environmental and social impacts and therefore environmental and social assessment studies have been conducted in accordance with national environmental assessment regulations (LI1652) and relevant World Bank Environmental and Social Standards culminating in the preparation of this Environmental and Social Impact Assessment (ESIA).

Notwithstanding the above potential positive impacts, a broad range of adverse impacts on the natural and human environments could arise from the pre-construction, construction, maintenance and operation and decommissioning phases of the proposed civil works. The various civil works have been designed and will be developed in a manner that will avoid or minimize the environmental and social impacts through careful planning, designing, construction and operation. Residual negative environmental impacts are expected to be limited and easy to mitigate as appropriate mitigation measures exist and are well known to the implementing agencies.



## 1.0 INTRODUCTION

Ghana is largely agrarian and natural resource dependent. The agriculture, forestry, and fishing sector (Ghana Living Standards Survey Report, 2015) employs about 3.3 million of the rural population; the cocoa sector is reported to employ 1 million households. Together, renewable and non-renewable natural resources contribute significantly to livelihoods for the most vulnerable rural communities. Rural employment makes up 49.1 percent (4.6 million) of total employment in Ghana. Informal employment, including a huge number of unskilled workers in agriculture and forestry, provides livelihoods for more than 70 percent of the rural population, particularly to the country's poorest households.

However, with the advent of climate change and resulting impacts and more recently, the COVID-19 pandemic, most rural livelihoods have become stressed. It is also evident that natural resources, including land and forests will continue to serve as the vehicle for long-term inclusive growth recovery and economic empowerment. Efforts have to be made to provide alternative livelihood opportunities to the rural population, largely smallholders, to cushion them from the effects of changes in the global climate and disease patterns. In introducing such interventions, it is critical to put up infrastructure that will respond to the environmental, social and economic dynamics prevailing in the zones, and make communities more resilient.

### 1.1 Background

The Environmental Protection Agency (EPA) and the Ministry of Lands and Natural Resources (MLNR) are currently implementing the Ghana Landscape Restoration and Small-Scale Mining Project (GLRSSMP) in support of targeted actions to address land degradation through sustainable Integrated Landscape Management (ILM). Under the GLRSSMP, the EPA is responsible for landscape restoration activities while the MLNR is responsible for formalization of Artisanal Small-scale Mining (ASM). The goal of the six-year project is to strengthen integrated natural resource management and increase benefits to communities in targeted savannah and cocoa forest landscapes.

The GLRSSMP is funded by the World Bank / International Development Association credit, with leveraged grant financing from the Global Environment Facility (GEF), the PROGREEN Trust Fund, and the Extractives Global Programmatic Support Trust Fund to upscale and support the Government of Ghana in sustainable land management to address land degradation in Ghana.

The project involves five basic components:

- Component 1. Institutional Strengthening for Participatory Landscape Management.

- Component 2. Enhanced Governance in Support of Sustainable Artisanal Small-Scale Mining
- Component 3: Sustainable Crop and Forest Landscape Management
- Component 4: Project Monitoring and Knowledge Management
- Component 5. Contingent Emergency Response Component

However, the sub-project activities being covered by the ESIA for the DNP fall under the component three (3) of the GLRSSMP. The component aims to link improved food production and ecological integrity. Among others, the component activities are directed towards supporting income generation and income diversification at community levels, with a view to integrated natural resource management in target cocoa and savannah landscapes. In this regard, facilities to be constructed include water systems (waterholes), game viewing platforms and safari trails within the park, boreholes and toilet facilities for admitted settlements within the park; and dugouts and mini cassava processing facilities in some fringe communities.

This Environmental and Social Impact Statement (ESIA) has been prepared as part of the Ghana EPA regulatory requirements for decision making and environmental permitting. This ESIA includes an Environmental and Social Management Plan (ESMP) which will be used in the preparation of bid documents for the selection of Contractor(s) for the execution of the project and will be required to integrate the recommended mitigation measures through the construction phase of the civil works.

## **1.2 Justification for the Sub-Projects**

Tourism continues to be a major earner to many countries especially in Eastern Africa and can also enhance livelihoods of communities around these tourist sites. The Digya National Park is one of the developing ecotourism sites in Ghana and has the potential to increase the tourist visits especially with its unique location, surrounded by the Sene River. It is the second largest national park and the oldest protected area in Ghana. The development of the civil works in and around the DNP is needed to boost the ecotourism capacity of the park.

The development of the mini processing facilities will enhance livelihoods through reduction of post-harvest losses and value addition of farmers in the fringe communities who are seen as collaborators in managing the park and reduce the exploitation of endangered resources in the park. The provision of the sanitary facilities for admitted settlers will also enhance the environmental integrity of the park.

### 1.3 Aims of the ESIA Study

The ultimate aim of the ESIA studies is to integrate environmental and social considerations into the sub-project design and to assess and predict potential adverse social and environmental impacts and to develop appropriate mitigation measures.

Specific objectives of the assignment are to:

- a. Delineate and describe the project components and activities; these activities fall under component three including waterholes, game viewing platforms, safari trails and mini cassava processing facilities.
- b. Characterise the valued environmental and social environments (fundamental elements of the physical, biological or socio-economic environment, including land use that may be affected by the proposed project); i.e biodiversity critical habitats, streams and movements of admitted settlers etc.
- c. Identify and assess potential environmental and social impacts that are likely to emanate from the construction, operation and decommissioning of the civil works (civil works to be constructed)
- d. Recommend feasible and cost-effective measures and processes to respectively mitigate or enhance potential adverse and positive environmental and social impacts that could result from construction, operation and decommissioning of the civil works;
- e. Prepare an Environmental and Social Management and Monitoring Plan (ESMMP) for mitigating the potential environmental and social impacts (including preventing Child Labour, Gender-based Violence (GBV), Sexual Exploitation and Abuse (SEA), and Sexual (SH) Harassment) of the proposed interventions and for monitoring the effectiveness of the mitigation measures, and
- f. Integrate environmental and social considerations into the technical engineering designs of the civil works and inform the implementation of sustainable measures during the construction, operation and decommissioning of the civil works.

### 1.4 Study Methodology

The approach and methodology for the ESIA study covered the following:

- Field visits and sites inspection
- Analysis of project alternatives

- Stakeholder identification and consultations
- Desktop study and document/literature review
- Specialist Surveys, Sampling and data analysis
- Identification and assessment of environmental and social impacts
- Development of environmental and social management and monitoring plan
- Reporting

#### 1.4.1 Field Visits

Field visits and inspection of sites selected for various sub-projects were undertaken as part of the preparation of the ESIA report. Consultations with major stakeholders were undertaken during this exercise to the project districts (Sene West, Sekyere Afram plains, Kwahu Afram Plains North and Kwahu Afram plains South) to sensitize major stakeholders including Beneficiary Agencies, Metropolitan, Municipal and District assemblies (MMDAs), the Digya National Park Managers and Rangers and fringe communities within the project area. The citizen engagement and stakeholder consultation took place from the period, 21<sup>st</sup> to 30<sup>th</sup> January 2024.

The purpose of the team visit was to

- assess the baseline conditions of the proposed sites for the civil works
- gather relevant data and have first-hand information for the preparation of the report
- consult with relevant stakeholders for their feedback to enrich the ESIA

List of team members involve in the visits are presented in table 1.1 (annex 1)

Community leaders in fringe communities (Dome, Lassi, Tato, Apapasu etc.) i.e. Chiefs, opinion leaders, and assembly members have been involved in decision making processes. Other groups in the beneficiary communities such as women, and other vulnerable groups were also engaged. These groups were given information on all aspects of the project intervention including the benefits, challenges and their obligation to the successful implementation of the project. Methods used to achieve this included focus group discussions and public announcements using existing community channels of information dissemination. Details of consultation outcomes, stakeholder concerns, and how their concerns informed the design and implementation of the sub-projects are contained in chapter 5 of this report.

The separate Stakeholder Engagement Plan prepared for the GLRSSMP provided guidance to the stakeholder engagement during the field visits.

### 1.4.2 Desktop Study and Documents/Literature Review

As part of preparation of the ESIA, relevant documents have been reviewed to provide insight into the proposed civil works. These include the following:

- Existing reports/documents, maps and data related to the execution of the Project.
- Existing field designs under the Sustainable Land and Water Management Project
- Design for Waterholes
- Ghana Landscape Restoration and Small-Scale Mining Project (GLRSSMP) Environmental and Social Screening of selected civil works, Screening Report Environmental Protection Agency (EPA)
- International Development Association Project Appraisal Document for Ghana Landscape Restoration and Small-Scale Mining Project August 10, 2021
- Environmental Protection Agency/Ministry of Environment Science Technology and Innovation, Ministry of Lands and Natural Resources Ghana Landscape Restoration and Small-Scale Mining Project (P171933) Environmental and Social Management Framework (ESMF), February 2021
- Environmental Protection Agency and Ministry of Lands and Natural Resources Ghana Landscape Restoration and Small-Scale Mining Project (P171933) Negotiated Environmental and Social Commitment Plan (ESCP), June 27, 2021
- Environmental Protection Agency (EPA) and the Ministry of Lands and Natural Resources (MLNR), Ghana Landscape Restoration and Small-Scale Mining Project (GLRSSMP) Project Implementation Manual (PIM), June 2021
- Centre pour le Développement de la Production Faunique Wildlife Production Development Centre, Inception Report, 30 December 2023
- Centre pour le Développement de la Production Faunique Wildlife Production Development Centre, Site Evaluation and Summary Construction Plan, Community : Sakalo, Site: Sata Optimised Dugout, 31 January, 2024

### 1.4.3 Data Analysis and Reporting

A collation and analyses of relevant data, pieces of information extracted from the desktop study / literature review, field visits and environmental media sampling have been carried out to produce this draft Environmental and Social Impact Assessment (ESIA). The ESIA has been presented and organized under the following headings

- Executive Summary
- Introduction
- Description of the Proposed Project and Alternatives
- Policy, Legal and Regulatory Framework

- Description of the Baseline Biophysical and Socio-Economic Environments
- Citizen Engagement and Stakeholder Consultation
- Identification of Potential Impacts
- Mitigation and Enhancement Measures
- Environmental and Social Management Plan (ESMP)
- Environmental and Social Monitoring Plan
- Conclusion

## 2.0 POLICY, LEGAL, REGULATORY AND INSTITUTIONAL FRAMEWORK

National and sector legislation and policies relevant to the development of the civil works under the GLRSSMP have been reviewed in this section. Also, institutional requirements, World Bank Environmental and Social Standards (ESSs) and national environmental quality standards for the management of environmental and social issues potentially associated with the proposed interventions have been considered.

### 2.1 Relevant Policies and plans

The relevant national policies and plans to guide the implementation of the project include the following

- National Environmental Policy, 2012;
- National Land Policy, 1999;
- National Water Policy, 2007;
- National Climate Change Policy, 2013;
- National Gender Policy, 2015;
- Ghana Accelerated Action Plan Against Child Labour (2023-2027)
- Riparian Buffer Zone Policy, 2014;
- National Environmental Action Plan/Policy, 1994
- National Workplace HIV/AIDS Policy; and
- Forest and Wildlife Policy, 2012

A detailed narrative of the applicable Ghana laws/policies, World Bank environmental and social standards and relevant international treaties, conventions and protocols are presented in this document.

Table 2-1 : Relevant Policies and Applicability

No	Policies/Plans	Applicability to the project
1	<p><b><u>National Environmental Policy, 2012</u></b></p> <p>The ultimate aim of the Policy is to improve the surroundings, living conditions and the quality of life of the entire citizenry, both present and future. It seeks to promote sustainable development through ensuring a balance between economic development and natural resource conservation. The policy thus makes a high-quality environment a key element supporting the country's economic and social development</p>	<p>The proposed project seeks to promote sustainable development by including economic, social and environmental considerations</p>

2	<p><b><u>National Land Policy, 1999</u></b></p> <p>The key aspects of the policy relevant to the project include: The use of any land in Ghana for sustainable development, the protection of water bodies and the environment and any other socioeconomic activity will be determined through national land use planning guidelines based on sustainable principles in the long-term national interest. Land categories outside Ghana's permanent forest and wildlife estates are available for such uses as agriculture, timber, mining and other extractive industries, and human settlement within the context of a national land use plan. All land and water resources development activities must conform to the environmental laws in the country and where Environmental Impact Assessment report is required this must be provided. Environmental protection within the 'polluter pays' principle will be enforced</p>	<p>Some of the civil works are in the protected area that is Digya National Park, while others are in the fringe communities. The implementation of the project will conform to the environmental laws of the country which includes the conduct of environmental and social impact assessment and obtaining an environmental permit from the EPA</p>
3	<p><b><u>National Water Policy, 2007</u></b></p> <p>The objective of Section 2.2.3 Focus Area 3 –Water for Food Security is to ensure availability of water in sufficient quantity and quality for the cultivation of food crops, watering of livestock and sustainable freshwater fisheries to achieve sustainable food security for the country. The relevant policy measures and/or actions to be undertaken include: encouraging efficient water from the dugout for livestock watering to ensure conservation of water</p>	<p>The project's Environmental and Social Management Plan (ESMP) will include mitigation measures against over- exploitation of water resources potentially arising from the development of boreholes and also against water pollution which could emanate from construction activities or waste management at the operation phase and use of other chemicals in riparian zones.</p>
4	<p><b><u>National Environmental Action Plan/Policy, 1994</u></b></p> <p>The National Environmental Action Plan was initiated to define a set of policy actions, related investments and institutional strengthening activities that would make Ghana's development strategy more environmentally sustainable. The Plan formulated a national environmental policy as the framework for implementing the Action Plan. The Policy aims at ensuring a sound management of resources and the environment and to avoid any exploitation of these resources in a manner that might cause irreparable damage to the environment. Specifically, it provides for maintenance of ecosystems and ecological processes essential for the functioning of the biosphere, sound management of natural resources and the environment, and protection of humans, animals and plants and their habitats.</p>	<p>The design and implementation of the proposed civil work will take into consideration measures to promote the sustainable use of natural resources and ensure environmental management.</p>



5	<p><b><u>National Climate Change Policy, 2013</u></b></p> <p>The Policy is built on seven (7no.) systematic pillars and the objective of the Policy is to mitigate and ensure an effective adaptation in key sectors of the economy, such as agriculture and food security, natural resources management, energy, industry and infrastructure among others. The objective is to build climate resilient technology</p>	<p>The civil works seek to build the resilience of beneficiary communities by adding value to the primary product i.e. mini cassava processing facility, the waterholes will also ensure that wildlife is not impacted negatively through water stress</p>
6	<p><b><u>Buffer Zone Policy, 2014</u></b></p> <p>The policy aims at providing comprehensive measures and actions that would guide the creation of vegetative buffers for the preservation and functioning of the nation’s water bodies and vital ecosystems.</p>	<p>The project will ensure that the necessary buffer distances are observed around Digya and Obosom rives</p>
7	<p><b><u>Ghana Accelerated Action Plan Against Child Labour (2023-2027)</u></b></p> <p>The Plan aims to strengthen communities and awareness raising and behavioural change to prevent and remediate child labour, decent youth employment and skills development. Priority sectors of relevance for the GLSRSSMP and civil works activities where child labour needs to be proactively identified and prevented include child labor in street hawking, begging and portorage which could happen around work-sites, illegal Small-Scale Mining (“galamsey”) and Quarrying which could take place in mining sites covered by the project, and transportation i.e. driving tricycle and small van, commercial sex exploitation of children, type of exploitation of children which could be occurring around project sites as a result of an increase in works and economic activities in the area.</p>	<p>The project will raise awareness on what child labour is in the communities, ensure clear labour standards for civil works, including age-verification and awareness, and collaborate with mandated ministries to monitor, identify and help remediate any potential cases of child labour that might occur.</p>
8	<p><b><u>National Gender Policy, 2015</u></b></p> <p>The National Gender Policy aims at mainstreaming gender equality concerns into the national development processes by improving the social, legal, civic, political, economic and socio-cultural conditions of the people of Ghana. It also seeks to empower the vulnerable groups particularly women, children, and people with special needs such as persons with disabilities and the marginalized</p>	<p>The project will mainstream gender issues including not discriminating against women and the vulnerable in the local communities. The ESMP has made provisions for managing GBV risks/issues.</p>

9	<p><b><u>National Workplace HIV/AIDS Policy</u></b></p> <p>The broad objectives of the National Workplace HIV/AIDS Policy, among others, are to provide protection from discrimination in the workplace to people living with HIV and AIDS; prevent HIV and AIDS spread among workers; and provide care, support and counselling for those infected and affected. The project will institute a plan of action to prevent HIV/AIDS spread through awareness creation.</p>	<p>The project duration will be short-term and use just a few migrant workers for some of the facilities. This will reduce the potential for HIV spread but an HIV policy will be provided as required by the national policy.</p>
10	<p><b><u>Forest and Wildlife Policy, 2012</u></b></p> <p>The policy aims at the conservation and sustainable development of forest and wildlife resources for the maintenance of environmental stability and continuous flow of optimum benefits from the socio-cultural and economic goods and services that the forest environment provides to the present and future generations whilst fulfilling Ghana's commitments under international agreements and conventions. The policy among others seeks to consolidate good governance through accountability and transparency, enhance active participation of communities and land owners in resource management and addressing issues on tree tenure and benefit sharing, promote small and medium forest and wildlife enterprises as a means of job creation for the rural and urban poor, and promote ecotourism development</p>	<p>The proposed civil works align with the objectives of the policy. . The construction of waterholes will help conserve wildlife due water availability for wildlife watering. The construction of facilities like game viewing platforms, safari trails etc. will also promote ecotourism and provision of basic facilities for admitted settlements and fringe communities will enhance community participation.</p>

## 2.2 Environmental Protection Agency act, 1994 (Act 490)

The Environmental Protection Agency Act, 1994 (Act 490) is the main legislation for ESIA studies in Ghana. The Act grants the Environmental Protection Agency (EPA) enforcement and standards-setting powers, and the power to ensure compliance with the Ghana environmental assessment requirements/procedures. Additionally, the EPA is required to create environmental awareness and build environmental capacity among all sectors. The EPA, including its Regional and District Offices, is also vested with the power to determine what constitutes an ‘adverse effect on the environment’ or an activity posing ‘a serious threat to the environment or public health’, to require environmental assessments and environmental management plans of an undertaking, and to regulate and serve enforcement notices for any offending or non-complying undertaking. The EPA is required to conduct monitoring to verify compliance with given approval/permit conditions, required environmental standards and mitigation commitments.

The Environmental Assessment (EA) Regulations, 1999 (LI 1652) combine both assessment and environmental management systems. The regulations prohibit commencing an undertaking / activity without prior registration and an environmental permit (EP). Undertakings are grouped

into schedules for ease of screening and registration and environmental permitting. The schedules include undertakings requiring registration and EP (Schedule 1), EIA mandatory undertakings (Schedule 2), as well as Schedule 5-relevant undertakings (located in Environmentally Sensitive Areas). The proposed civil works in the Digya National Park falls under schedule 5.

The Regulations also define the relevant stages and actions, including registration, screening, preliminary environmental assessment, scoping and terms of reference (ToR), environmental impact assessment, review of EA reports, public notices and hearings, environmental permitting and certification, fee payments, environmental management plan, suspension/revocation of permit and complaints/appeals.

Under the EA Procedures it is required that an Environmental Impact Statement is prepared by the proponent to clearly present an assessment of the impacts of the proposed project on the environment based on the terms of reference as stipulated in the scoping report. The EA Procedures requires that potential direct and indirect impacts of the project on the environment covering the pre-construction, construction, operation, decommissioning and post decommissioning stages are addressed.

### **2.3 Legislative and Regulatory Framework**

The project will be implemented and guided by relevant legal and legislative frameworks to ensure sustainability and compliance. They include the following

- Environmental Protection Act, 1994 (Act 490)
- Environmental Assessment Regulations, 1999 (LI 1652)
- Forestry Commission Act, 1999 (Act 571)
- Mining and Minerals Act, 2006 (Act 703)
- Land use and Spatial Planning Act, 2016 (Act 925)
- Land Act, 2020 (Act 1036)
- The Labour Act, 2003 (Act 651)
- Workman’s Compensation law, 1987 (PNDCL 187)
- Public Health Act, 2012 (Act 851)
- Ghana Disability Act, 2006 (Act 715)
- Fees and Charges (Miscellaneous Provisions) Act, 2022 (Act 1080)
- Water Resources Commission Act, 1996 (Act 522)
- Water Use Regulations, 2001 (LI 1692)
- Hazardous and Electronic Waste Control and Management Act, 2016 (Act 917)

- Hazardous Electronic and other Waste (Classification), Control and Management Regulations, 2016 (LI2250)
- Wildlife Resource Management Act 2023 (Act 1115)
- Local Governance Act, 2016 (Act 936)
- Children’s Act, 1998 Amended in 2016 (Act 937)
- The Child Labour Hazardous Activity Framework (2021)
- Wild Animals Preservation Act 1961 (Act 43)
- Wildlife Conservation Regulation, 1971 (L.I. 685)
- National Building Regulations, 1996 (LI 1630)
- Ghana Building Code (GhBC; GS 1207), 2018
- Factories, Offices and Shops Act, 1970 (Act 328)
- Ghana National Fire Service Act, 1997 (Act 537)
- Fire Precaution (Premises) Regulations, 2003 (LI1724)

The relevance of the above listed legislative and regulatory framework is provided in the table below

Table 2-2 : Relevant Legal Framework and their applicability

No	Legal Framework and Key Compliance Requirement	Applicability to Proposed project
1	<p><b><u>Environmental Protection Agency (EPA) Act 1994, Act 490</u></b>            The Environmental Protection Agency (EPA) Act 1994 (Act 490) gives a mandate to the Agency to ensure compliance of all investments and undertakings with laid down Environmental Assessment (EA) procedures in the planning and execution of development projects, including compliance in respect of existing ones. The Environmental Protection Agency (EPA) Act 490 Section 12 of 1994 confers enforcement and control powers on the EPA to compel existing companies to submit environmental or pollution management plans on their operations as a management tool for effective pollution control. The EPA is the responsible for issuing environmental permits for operations such as this project subject to EPA review</p>	<p>The project will be in compliance with the Environmental Assessment (EA) procedures for approval of the EPA.            The proposed project will involve the clearing of vegetation and generation and disposal of waste. Also, an EPA permit will be obtained</p>
2	<p><b><u>Environmental Assessment Regulations 1999, LI 1652</u></b>            The Environmental Assessment Regulations 1999 (LI 1652) enjoins any proponent or person to register an</p>	<p>The project will be guided by LI 1652 including registering project</p>

No	Legal Framework and Key Compliance Requirement	Applicability to Proposed project
	<p>undertaking with the Agency and obtain an Environmental Permit prior to the commencement of the project. This regulation allows the EPA to place proposed undertakings at the appropriate level of environmental assessment. The LI 1652 seeks to ensure that development is undertaken in a sustainable environment</p>	<p>with the EPA and obtaining an environmental permit.</p>
3	<p><b><u>Fees and Charges (Miscellaneous Provisions) Act, 2022 (Act 1080)</u></b>            The Fees and Charges (Miscellaneous Provisions) Act, 2022 (Act 1080) sets out the fee regime for processing and issuing environmental permits, in line with the Environmental Assessment Regulations 1999, (LI1652).</p>	<p>The processing and permit fees are required for initial registration, and permit issuance respectively</p>
4	<p><b><u>Water Resources Commission Act, 1996 (Act 522)</u></b>            It establishes and mandates the Water Resources Commission (WRC) as the sole agency responsible for the regulation and management of the utilisation of water resources and for the co-ordination of any policy in relation to them. Section 13 prohibits the use of water (divert, dam, store, abstract or use water resources or construct or maintain any works for the use of water resources) without authority. Section 16 empowers the Commission to grant Water Rights (water use permits) to prospective users. The Act states under Section 24 that any person who pollute or fouls a water resource beyond the level that the EPA may prescribe commits an offence and is liable on conviction to a fine or a term of imprisonment or both.</p>	<p>The dugouts and bore holes will be constructed in compliance with this requirement. The PCU with the approval of the ESIA will secure environmental and water permits from EPA and WRC respectively</p>
5	<p><b><u>Water Use Regulations, 2001 (LI 1692)</u></b>            The Water Use Regulations 2001, LI 1692 prohibits the use of water resources without authority from the Water Resources Commission. It provides procedures for allocating permits for various water uses including domestic, commercial, municipal, industrial, agricultural, power generation, water transportation, fisheries (aquaculture), environmental, recreational and underwater (wood) harvesting. The Act provides under section 16 for any person to apply to the Commission in writing for the grant of water right. The Regulations also prescribe the raw water charges and processing fees to be paid by</p>	<p>The PCU will ensure compliance with this regulation by obtaining the necessary permits. The approval of the ESIA report is required for these permits.</p>

No	Legal Framework and Key Compliance Requirement	Applicability to Proposed project
	prospective water users with respect to the water use permits. The Commission is also mandated to request for evidence that an environmental impact assessment or an environmental management plan has been approved by the EPA before issuance of the Water Use Permit	
6	<p><b><u>Local Governance Act, 2016 (Act 936)</u></b> This Act establishes and regulates the local government system and gives authority to the Regional Coordinating Council (RCC) and the District Assembly to exercise political and administrative power in the regions and districts respectively. This includes initiation of development programmes as well as development, improvement and management of human settlements and the environment through departments such as the Environmental Health (EHD) and Social Welfare and Community Development (SWCD) Departments</p>	Technical advice will be sought from the Physical Planning Department of the District Assembly on the siting of dugouts and processing facilities. The department will advise and assist the PCU to secure site plans and zoning for the sites where, these facilities will be constructed.
7	<p><b><u>Land Act, 2020 (Act 1036)</u></b> This Act harmonises and consolidates the laws on land, to ensure sustainable land administration and management, effective and secure land tenure. It also provides for related matters.</p>	The Land Act provides a framework to guide the project proponent in the acquisition of land for facilities to be constructed in the fringe communities. It also defines the various approaches the state (including the project proponent) may acquire land for public purposes, including gifts or voluntary donations of land to the state. Furthermore, it provides for how the land so acquired should be documented, and registered etc.
8	<p><b><u>The Children's Act 1998 Amended in 2016 (Act 937)</u></b> It seeks to reform and consolidate the law relating to children, provide for the child's rights, maintenance, and adoption, regulate child labour and apprenticeship for ancillary matters concerning children generally, and to provide for related matters. Section 87 of this Act states, "No person shall subject a child to exploitative labour". Therefore, no project activities shall engage children</p>	Provisions against exploiting child labour have been included in the ESMP

No	Legal Framework and Key Compliance Requirement	Applicability to Proposed project
	below the legal working age (18 years for hazardous work).	
9	<p><b><u>Wild Animals Preservation Act 1961 (Act 43)</u></b>            The Act provides for the protection of selected animals through restrictions on export and hunting of scheduled species. This empowers the President to exercise the overall control over wildlife and also provides for the creation of Wildlife Reserves.</p>	The project activity will not trigger this regulation.
10	<p><b><u>Wildlife Conservation Regulation, 1971 (L.I. 685)</u></b>            The Wildlife Conservation Regulation provides for hunting restrictions in relation to different species of animals which are classified into wholly and partly protected animals.            The Regulation further prohibits hunting without a license and exporting game or trophies without permit and provides for rules and procedures in relation to game licenses and export permits. Lastly rules of operation for game officers are included in the regulation.</p>	The project will contribute to the conservation of wildlife by ensuring that the Contractor will have the responsibility to educate and control workers against actions that will disturb wildlife i.e. unauthorised hunting of animals
11	<p><b><u>Wildlife Resources Management Act, 2023 (Act 1115)</u></b>            The Wildlife Resources Management Act aims to promote sustainable wildlife management, conservation, and community involvement in protecting Ghana's biodiversity. It sets clear guidelines for wildlife protection, licensing, and enforcement to safeguard the country's natural heritage for future generations. The Act outlines the functions of the Forestry Commission, including managing protected areas, establishing advisory committees, and promoting sustainable tourism development within these areas, while ensuring environmental safeguards and community involvement. Additionally, it assists local communities in establishing and managing Community Resource Management Areas (CREMAs), enforces regulations on hunting and trading of wildlife, and represents the government in international wildlife conventions. It establishes Protected Area Management Advisory Committees for each area to integrate local community needs and ensure conservation efforts align with national objectives</p>	Some of the project interventions will be managed by the two CREMAs that will be established in the fringes of the Digya National Park, precisely the Sene West and Kwahu-Afram Plains south sections of the park
12	<b><u>National Building Regulations, 1996 (LI 1630)</u></b>	

No	Legal Framework and Key Compliance Requirement	Applicability to Proposed project
	<p>The National Building Regulations, 1996 (LI 1630) make it an offence for any individual to undertake any development without the acquisition of a Building Permit from the appropriate authority. This ensures that buildings are well planned and are in conformity with the Assembly’s plan designs of an area. The LI 1630 ensures that buildings are well planned, consistent with the Assembly’s spatial plan for an area.</p>	<p>The project will involve development of infrastructure particularly the mini processing facilities and the necessary building permit will be acquired</p>
13	<p><b><u>Ghana Building Code (GhBC; GS 1207), 2018</u></b>            The Ghana Building Code sets out the requirements, recommendations, planning, management and practices that will lead to the country's smooth operation and construction of residential and non-residential buildings.</p>	<p>The project activities will be undertaken according to the specification of the Ghana Building Code.</p>
14	<p><b><u>Land Use and Spatial Planning Act, 2016 (Act 925)</u></b>            The Land Use and Spatial Planning Act, 2016 (Act 925) regulates land use through a decentralised planning system to ensure judicious use of land in order to improve quality of life, promote health and safety in respect of human settlements and generally provide for spatial aspects of socio-economic development and related matters.</p>	<p>The project design will be guided by planning schemes and local plan guides developed by the Land Use and Spatial Planning Departments/District Assemblies</p>
154	<p><b><u>Labour Act, 2003 (Act 651)</u></b>            The Labour Act 2003 (Act 651) Section 118(1) stipulates that it is the duty of an employer to ensure that satisfactory, safe and healthy conditions are provided for every worker. Under these provisions, a worker is required to report situations that he believes may pose “an imminent and serious danger to his or her life, safety or health</p>	<p>Construction activities could result in injuries and fatalities. HSE issues will be duly assessed and mitigated against in the proposed ESMP for the project</p>
16	<p><b><u>Workmen’s Compensation Law, 1987 (PNDCL 187)</u></b>            It is to provide for the payment of compensation to workmen for personal injuries caused by accidents arising out and in the course of their employment. The tenets of the law place a large share of the burden of supporting workers injured at the workplace on the shoulders of the employers.</p>	<p>The Labour policy and employment contracts will provide for workmen compensation in the event of injury.</p>
17	<p><b><u>The Public Health Act, 2012 (Act 851)</u></b>            The Public Health Act, 2012 (Act 851) is an Act to revise and consolidate the law relating to public health to prevent disease, promote, safeguard, maintain and protect the</p>	<p>Measures will be put in place to ensure project activities do not cause any public health risks to</p>



No	Legal Framework and Key Compliance Requirement	Applicability to Proposed project
	health of humans and animals and to provide for related matters.	humans and animals in accordance with the Act.
18	<p><b><u>The Persons with Disability Act 2006. (Act 715)</u></b>            An Act to provide for persons with disability, to establish a National Council on Persons with Disability and to provide for related matters. Provisions include the right to a family life and participation in social, creative or recreational activities; the prohibition of differential treatment for residential purposes, the right to the same living conditions as persons without disability when persons with disability are placed in special institutions. No exploitation, abuse, discrimination or disrespect to persons with disability, appropriate facilities when involved in court proceedings; and access to public places.</p>	The project will comply with this Act and ensure that there is no discrimination against disabled persons. Non-discrimination policies will be put in place and enforced, including ensuring that infrastructure developed are accessible by people with disabilities
19	<p><b><u>Hazardous and Electronic Waste Control and Management Act, 2016 (Act 917)</u></b>            The Hazardous and Electronic Waste and Control Act 2016 (Act 917) provides list of hazardous and other waste. It also provides control, management and disposal of electrical and electronic waste. Hazardous waste generally refers to waste with properties that makes it potentially dangerous or harmful to human health or the environment and they include liquids, solids or gases which cannot be treated or disposed of by common mean</p>	Substances hazardous to health such as waste oils and residual chemicals will be disposed of properly
20	<p><b><u>Hazardous, Electronic and Other Wastes (Classification) Regulations, 2016 (LI2250)</u></b>            The purpose of these Regulations is to (a) regulate the classification control and management of waste: (b) establish a mechanism and procedure for the listing of waste management activities that do not require a Waste Management Permit; (c) prescribe requirements for the establishment of take-back systems, (d) prescribe requirements and timeframes for the management of wastes listed in the First Schedule; (e) prescribe general duties of waste generators, waste transporters and waste managers; and (f) prescribe requirements for the disposal of wastes</p>	Management of hazardous waste e.g. chemicals or other toxic wastes will be guided by the Schedules in LI2250
21	<b><u>Factories, Offices and Shops Act, 1970 (Act 328)</u></b>	

No	Legal Framework and Key Compliance Requirement	Applicability to Proposed project
	The Act requires all proponents to register every factory/workplace with the Chief Inspector of Factories Inspectorate Division (FID), report accidents, dangerous occurrences and industrial diseases, post in a prominent position in every factory the prescribed abstract of the Act and other notices and documentations, as well as outlines the regulations to safeguard the health and safety of worker	Processing facilities will be operated in accordance with this Act. Accidents/incidents will be captured in the HSE policy. Also, relevant safety notices will be posted at vantage points.
22	<b><u>Ghana National Fire Service Act, 1997 (Act 537)</u></b> The Ghana National Fire Service (GNFS) Act, 1997 (Act 537) re- established the National Fire Service to provide for the management of undesired fires and to make provision for related matters. The objective of the Service is to prevent and manage undesired fire. For the purpose of achieving its objective, the Service shall organise public fire education programmes to create and sustain awareness of the hazards of fire, heighten the role of the individual in the prevention of fire and provide technical advice for building plans in respect of machinery and structural layouts to facilitate escape from fire, rescue operations and fire management.	Fire incidents are common in Ghana and in the project area so the Fire Service will be engaged to provide education/ sensitization on fire prevention and fighting as part of the overall project implementation
23	<b><u>Fire Precaution (Premises) Regulations, 2003 (LI1724)</u></b> The Fire Precaution (Premises) Regulations 2003 (LI 1724) requires all premises intended for use as workplaces to have Fire Certificates	Fire certificates will be obtained for the processing facilities
24	Child Labour Hazardous Activity Framework, 2021 Defines light work permitted to children under the minimum age of employment and hazardous work prohibited to children under 18.	The project will ensure through the contractors that employment and hazardous work is prohibited for children under 18 during constructional activities

## 2.4 National Environmental Standards

The National Environmental Standards provide for permissible levels for ambient air quality, noise levels and effluent quality standards for discharge into natural water bodies. The environmental standards being adopted for this project include;

- Ghana Standards for Ambient air quality and point source air emissions (GS1236:2019)
- Ghana Standards Environmental Protection - Requirements for Effluent Discharge (GS1212:2019)

- Ghana Standards Health Protection - Requirements for Ambient Noise control (GS1222:2018)
- Ghana Standards for Environment and Health Protection - Requirements for Motor Vehicle Emissions (GS1219, 2018)

Table 2-3 : Ghana Standards and their relevance

No.	Standard	Applicability
1	<p><b><u>Ghana Standard for Environmental Protection - Requirements for Effluent Discharge (GS1212, 2019)</u></b></p> <p>Ghana Standard for Environmental Protection - Requirements for Effluent Discharge (GS1212, 2019); specifies requirements for sector specific effluent quality and also gives guideline discharge into the environment.</p>	<p>Effluent from the operational phase emanating from mini cassava processing facilities will be managed as specified in the proposed ESMP</p>
2	<p><b><u>Ghana Standards for Environment and Health Protection -Requirements for Ambient Air Quality and Point Source/Stack Emissions (GS 1236, 2019)</u></b></p> <p>Ghana Standards for Environment and Health Protection - Requirements for Ambient Air Quality and Point Source/Stack Emissions (GS 1236, 2019) specifies the requirements and methods of analysis for ambient air. It also specifies the requirements and test methods for point source or stack emissions based on the sources of energy.</p>	<p>Dust and vehicular emissions will be controlled as specified in the proposed ESMP</p>
3	<p><b><u>Ghana Standards for Health Protection - Requirements for Ambient Noise Control (GS 1222, 2018)</u></b></p> <p>Ghana Standards for Health Protection - Requirements for Ambient Noise Control (GS 1222, 2018) specifies the requirements for acceptable ambient noise levels within categorized locations. According to the Standards, the test method should be in accordance with the relevant test methods given in GS 1253:2018 (Acoustics- Guide for the measurement of outdoor A-weighted sound levels</p>	<p>Noise generated at both the construction and operation stages will be monitored as stated in the proposed ESMP to ensure it does not exceed acceptable limits</p>

4	<p><b><u>Ghana Standards for Environment and Health Protection - Requirements for Motor Vehicle Emissions (GS1219, 2018)</u></b></p> <p>Ghana Standards for Environment and Health Protection - Requirements for Motor Vehicle Emissions specifies the requirements for exhaust emissions of motor vehicles as well as tractors, farm equipment, mobile industrial /construction machines (such as excavators)</p>	<p>Vehicles for transportation of materials and workers will produce fumes but will be managed with regular maintenance as stipulated in the proposed ESMP</p>
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## 2.5 Institutional Framework

### 2.5.1 Ministry of Environment, Science, Technology and Innovation

The Ministry is the parent ministry that oversees the activities of the EPA and is responsible for formulating policies aimed at safeguarding the country’s environment and ensuring accelerated socio-economic development of the nation through the formulation of sound policies and a regulatory framework to promote the use of appropriate, environmentally friendly, scientific and technological practices and techniques. Specific medium-term objectives include:

- Intensification of the application of safe and sound environmental practices
- Development and promotion of a science and technology culture at all levels of society; and strengthening of compliance of human settlements standards in communities.

### 2.5.2 Environmental Protection Agency

The EPA is a statutory body mandated to deal with environmental protection and regulation of environmental issues and its related purposes and it is also an implementing Agency for the GLRSSMP. The EPA coordinates other beneficiary agencies who are part of the implementation and is the main proponent of these civil works.

### 2.5.3 Wildlife Division of Forestry Commission

The Wildlife Division (WD) is one of the three divisions of the Forestry Commission and it is a beneficiary agency under the GLRSSMP. The mission of WD is to ensure conservation, sustainable management and development of Ghana’s wildlife resources for socio-economic benefit to all segments of society. It has the mandate to conserve wildlife in Ghana in general and manage wildlife protected areas in particular within representative ecological zones of the country. The Division will manage the infrastructure that will be constructed within the Digya National Park and its fringes.

## 2.6 Relevant World Bank Environmental and Social Standards

The World Bank, through the development of its Environmental and Social Framework (ESF), sets out standards to be applied to an investment. The ten standards replace the former operational policies that guided project implementation. The ten Environmental and Social Standards (ESSs) set out the obligations that a project must comply with throughout its life cycle. Among these, eight (8) are triggered by the project and they are discussed below:

**ESS 1-assessment and management of environmental and social risks and effects:** it calls for an environmental and social assessment that is proportionate to the risks and effects of the Projects to ensure that the Projects are environmentally and socially viable and sustainable. This assessment will serve as a basis for Project design and will help to identify mitigation measures and actions and improve decision-making.

**ESS 2-Labour and working conditions:** it defines, within the framework of the jobs created by the Project, inter alia, conditions for fair treatment and equal opportunity, the obligation to prevent the use of forced labour and child labour, to protect and secure Project workers, especially those who are vulnerable such as women, disabled persons, etc., and to ensure that the Project can meet the requirements of the ESS2

**ESS 3-Rational Use of Resources, Prevention and Management of Pollution:** This standard recognizes that economic activity is often the source of air, water and soil pollution and depletes already limited resources. It calls for 1- Promoting the sustainable use of resources, including energy, water and raw materials; 2- Avoiding or minimizing the adverse effects of the Project on human health and the environment by avoiding or minimizing pollution from Project activities; 3- Avoiding or minimizing emissions of short- and long-lived air pollutants associated with the Project; 4- Avoiding or minimizing the generation of hazardous and non-hazardous waste.

**ESS 4 Community health and safety** of the population: It addresses the risks and effects of the Project on the health, safety and security of Persons Affected by the Project (PAPs), and the Proponent's responsibility to avoid or minimize these risks and effects, with particular attention to vulnerable groups. The proponent is responsible for "1-Preventing or avoiding adverse effects on the health and safety of people affected by the Project throughout the Project, whether in normal or exceptional circumstances; 2-Encouraging the consideration of quality and safety considerations and climate change issues in the design and construction of infrastructure, including dams; 3- Avoid or minimize community exposure to risks related to Project traffic and road safety, diseases and hazardous materials; 4- Implement effective measures to deal with emergency

situations; 5- Ensure that the protection of personnel and property avoids or minimizes risks to communities affected by the Project".

- Annex 1 of ESS 4: "Dam Safety": It imposes specific safety measures for dams, including the recruitment of independent, experienced and competent professionals to supervise the design and construction of new dams or to inspect and assess the safety level of the existing or under construction dam, their operation and maintenance procedures, and make recommendations for any refurbishment or safety measures necessary to bring the existing or under construction dam to an acceptable level of safety. It is mentioned that "dam safety reports" will have to be prepared,

**ESS 5-land acquisition, land use restrictions and forced resettlement:** which is the standard of reference in the event of population displacements necessitated by the Project. ESS 5 advocates the avoidance or, failing that, the minimization of physical or economic displacement through a rigorous and careful study of the various Project design options. Where displacement cannot be avoided, ESS 5 provides the mechanisms for carrying out the process in a participatory manner with a view to achieving peaceful, sustainable and mutually acceptable resettlement and compensation solutions. It also states that displaced populations should receive "prompt compensation for the replacement cost of their property" and that the Project should "help displaced persons to improve, or at least restore in real terms, their livelihoods and standard of living prior to their displacement or prior to the commencement of Project implementation". ESS 5 also provides for handling instances of land acquisition where people or communities willingly donate a portion of their land for project purposes, for no compensation or reduced compensation. Voluntary land donations may involve some monetary or nonmonetary benefits or incentives provided to the land donor by the project or by community members benefiting from a project. Both can be broadly classified as a voluntary land donation, because the transfer of assets takes place without payment of compensation at replacement value. . Such situations will be considered subject to the World Bank's Voluntary Land Donation Protocol and prior Bank approval. In any case, the following conditions and requirements, as foreseen in ESS5, should be verified, demonstrated and documented:

1. the potential donor or donors have been appropriately informed and consulted about the project and the choices available to them;
2. potential donors are aware that refusal is an option, and have confirmed in writing their willingness to proceed with the donation;
3. no household relocation is involved;
4. the donor is expected to benefit directly from the project; and
5. for community or collective land, donation can only occur with the consent of individuals using or occupying the land.
6. All family members (including spouses) must be aware of the donation, in order to minimize the risks of women users of the land to be donated being passed over in decision-making on land donation and the risks of cross-generational conflicts being avoided.
7. Individuals using or occupying community or collective lands must also be aware of the donation to minimize risks of settlers or migrants being passed over in decision-making on land donation.

8. The PCU establishes that the land to be donated is free of encumbrances and encroachment and
9. registers the donated land in an official land registry (i.e., the Lands Commission in this case)
10. Any donated land that is not used for its agreed purpose is returned to the donor by the PCU in collaboration with the Lands Commission.
11. The PCU will decide, when necessary, whether the land donated is no longer needed for the intended purpose of the project.
12. a transparent record of all consultations and agreements reached is kept by the PCU.
13. There is documentation of the land indicating clearly, the size, the location/situated, and signatories of the parties (consent).

**ESS6 recognizes the importance of maintaining core ecological** functions of habitats, including forests, and the biodiversity they support. Habitat is defined as a terrestrial, freshwater, or marine geographical unit or airway that supports assemblages of living organisms and their interactions with the non-living environment. All habitats support complexities of living organisms and vary in terms of species diversity, abundance and importance

**ESS 8 on cultural heritage:** to be considered if a cultural heritage site is present in the Project area. It sets out general requirements relating to the consideration of cultural heritage as an "integral aspect of sustainable development", and its protection (both tangible cultural heritage, such as natural elements, and intangible cultural heritage such as beliefs, traditions, practices, representations, skills, etc.). Cultural heritage will need to be identified and inventoried through in-depth consultations with communities. Its protection during both the construction and operational phases must be a priority of any Project.

**ESS 10: Stakeholder Engagement and Information Disclosure:** This standard recognizes the importance of open and transparent collaboration between the Borrower and Project stakeholders as an essential element of good international practice. It is recommended that : 1- Establish a systematic approach to identifying and mobilizing stakeholders that will enable a constructive relationship to be established and maintained with them, particularly those affected by the Project; 2- Assess the level of interest and commitment of stakeholders and allow their opinions to be taken into account in the design of the Project and its environmental and social performance; 4- Ensure that stakeholders receive timely, understandable, accessible and appropriate information on the Project's environmental and social risks and effects

A gap analysis of national regulation as compared with the ESS is presented in table 2-4 covers ESS1, ESS2, ESS3, ESS4, ESS5, ESS6, ESS8, and ESS10. The columns describe the scope and objectives of the aforementioned ESS's, description of WB policies, description of government

regulation, identified gaps and how these gaps will be addressed during project implementation. ESS7 and ESS9 are not relevant to this project.



Table 2-4 : Gap Analysis – Comparison of Ghana’s Regulations/Policies and World Bank ESF for Handling Environmental and Social Risks

Scope/Objective	Description of Bank Policy	Description of Government of Ghana Regulation	Gaps Identified	Gap Bridging Actions
<b>ESS 1: Assessment and Management of Environmental and Social Risks and Impacts</b>				
<p><b>- identify, evaluate and manage the environment and social risks and impacts of the project in a manner consistent with the ESSs.</b></p> <p><b>- To adopt a mitigation hierarchy approach to:</b></p> <p><b>(a) Anticipate and avoid risks and impacts</b></p> <p><b>(b) Where avoidance is not possible, minimize or reduce risks and impacts to acceptable levels;</b></p> <p><b>(c) Once risks and impacts have been minimized or reduced, mitigate; and</b></p> <p><b>(d) Where significant residual impacts remain,</b></p>	<p>The standard provides guidance on assessing the Project’s potential environmental and social risks and impacts and addressing potential impacts through planning and mitigation hierarchy approach.</p>	<p>Environmental Assessment. Regulation 1 (2) of LI 1652 mandates that no person shall commence an undertaking which in the opinion of the Agency has or is likely to have adverse effects on the environment or public health unless, prior to the commencement, the undertaking has been registered by the EPA and an environmental permit has been issued by the Agency in respect of the undertaking.</p>	<p>Even though the regulation seeks to anticipate and mitigate/avoid risks and impacts, it does not fully address potential impacts and mitigation hierarchy approach e.g. content wise it does not address impacts on the vulnerable</p>	<p>- Assistance /compensations are provided for the affected parties by government through the district and municipal assemblies at various project locations.</p> <p>- The MDAs were fully involved in the project preparatory stage through consultations for them to become abreast with project components roles they will play during implementation.</p> <p>- The capacities of the MDAs staff on world bank ESF will also be built at the early stage of project implementation to enable them collaborate effectively in addressing this gap</p>

<p>compensate for or offset them, where technically and financially feasible.</p>				
<b>ESS2: Labour and Working Conditions</b>				
<p><b>- To promote safety and health at work, fair treatment, non-discrimination and equal opportunity of project workers including vulnerable workers such as women, persons with disabilities, children</b>  <b>- To prevent the use of all forms of forced labour and child labour.</b>  <b>• To support the principles of freedom of association and collective bargaining of project workers in a manner consistent with national law. • To provide project workers with accessible means to raise workplace concerns.</b></p>	<p>ESS2 promotes the fair treatment, non-discrimination and provision of equal opportunities for workers engaged on projects it supports. It strongly encourages protection of all project workers, including vulnerable groups such as women, persons with disabilities, children (of working age) and migrant workers, contracted workers and primary supply workers, as appropriate. It provides certain requirements that the project must meet in terms of working conditions, protection of the work force</p>	<p>- The Labour Act 2003 (Act 651) provides for the rights and duties of employers and workers; legal or illegal strike; guarantees trade unions the freedom of associations and establishes Labour Commission to mediate and act in respect of all labour issues. Under Part XV (Occupational Health Safety and Environment), the Act explicitly indicates that it is the duty of an employer to ensure the worker works under satisfactory, safe and healthy conditions.          - The Workmen's Compensation Law 1987 (PNDC 187) seeks to address the necessary compensations needed to be</p>	<p>The Ghanaian laws do not explicitly or specifically consider protection of vulnerable group and prevention of all forms of forced and child labour.          - it does not provide for grievance mechanism that addresses concerns promptly and transparent process that provides timely feedback           The minimum age for light work is lower in the Ghanaian legislation than the standard set in ESS2.</p>	<p>-The project will adopt and enhance and existing transparent GRM which addresses concerns promptly          - It has also developed labour management procedures e.g. working conditions, occupational health and safety, child labour etc. (section 5.4) which will guide project implementers in managing labour related issues. For instance, in to avoid child labour the acceptable age will be 18 years and the Ghana 2010 risks assessment technique of child labour monitoring (CLM) described under (section 5.4.4) will also be observed to ensure that labour management procedures in</p>

	(especially the prevention of all forms of forced and child labour), and provision of a grievance mechanism that addresses concerns on the project promptly and uses a transparent process that provides timely feedback to those concerned. ESS2 defines the minimum age for work to 14 years, unless national standards set a higher age, and the minimum age for hazardous work to 18 years.	awarded to workers for personal injuries arising out of and in the course of their employment. Ghanaian legislation defines the minimum age for light work to 13, minimum age for employment to 15 and minimum age for hazardous work to 18 years.	- Currently Ghana does not have a national policy on occupational health and safety	respect of child labour is respected.  The 3 main regulations that deals with OHS issues are <i>Factories, Offices and Shops Act 1970, (Act 328)</i> , <i>Workmen's Compensation Law 1987 (PNDC 187)</i> and the <i>Labour Act 2003 (Act 561)</i> , have regulations that deal with health and safety management at the work environment. OHS issues are regulated by the Department of Factories Inspectorate of the Ministry of Employment and Labour Relations (MELR). The project will work closely with the department to ensure that issues on OHS are dealt with to meet standards set out in the ESS2
<b>ESS3: Resource Efficiency and Pollution Prevention and Management</b>				
<b>To achieve the sustainable use of resources,</b>	The ESS3 provides requirements for	The Act 490 mandates the EPA to enforce	The regulation ensure that measures are put	The Project has developed a pest management plan

<p><b>including energy, water and raw materials, as well as implement measures that avoids or reduces pollution resulting from project activities and to minimize the risks and impacts associated with pesticide use.</b></p>	<p>projects to achieve the sustainable use of resources, including energy, water and raw materials, as well as implement measures that avoids or reduces pollution resulting from project activities. The standard places specific consideration on hazardous wastes or materials and air emissions (climate pollutants) given that the current and projected atmospheric concentration of greenhouse gases (GHG) threatens the welfare of present and future lives.</p>	<p>compliance with established EIA procedures among companies and businesses in the planning and execution of development projects, including existing projects.</p> <p>- Part II of the Act also mandates the Agency to register and manage all pesticides to ensure that the approved ones are used.</p> <p>- There are also national standards for wastewater discharges and ambient air and noise quality. These are:</p> <ol style="list-style-type: none"> <li>1. Ghana standards for environmental protection and health requirement for effluent discharges, GS1212, 2019</li> <li>2. Ghana standards for environmental protection and health requirement for ambient air quality and dust/point source</li> </ol>	<p>in place by polluters through routine monitoring by regulatory agencies and institutions i.e. EPA, WRC etc. it does not address the risks associated with the use of pesticides by prospective users</p>	<p>(PMP) to be implemented holistically by all implementing Agencies i.e. MOFA, EPA and FC to ensure that pesticides use is reduced to the barest minimum whilst promoting integrated pest management techniques.</p>
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		<p>emissions GS 1236, 2019</p> <p>3. Ghana standards for environmental protection and health requirement for ambient noise control GS1222, 2018</p> <p>4. Ghana standards for acoustic guide for measurement of outdoor weighted sound level, GS1253, 2018</p> <p>5. Ghana standards for environment and health protection requirement for motor vehicle emissions GS1219, 2018</p>		
<b>ESS4: Community Health and Safety</b>				
<p><b>- To anticipate and avoid adverse impacts on the health and safety of project affected communities during the project life-cycle from both routine and non-routine circumstances.</b></p> <p><b>- To promote quality and safety, and</b></p>	<p>This standard recognizes that project activities, project equipment and infrastructure increase the exposure of project stakeholder communities to various health, safety and security risks and impacts and thus recommends that</p>	<p>The Public Health Act, 2012, Act 851 revises and consolidates all the laws and regulations pertaining to the prevention of disease, promote, safeguard and maintain and protect the health of human and animals, and to provide for related matters. The law</p>	<p>The regulation does not consider assessment of events and measures to deal with occurrences and emergencies</p>	<p>The law provides the platform to engage with stakeholders and with the stakeholder engagement plan in place for project implementation community needs with respect to project activities will be assessed and necessary measures taken. The national disaster management</p>

<p><b>considerations relating to climate change, in the design and construction of infrastructure, including dams.</b>  <b>- To ensure that safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.</b></p>	<p>projects implement measures that avoids or limits the occurrence of such risks. It provides further requirements or guidelines on managing safety, including the need for projects to undertake safety assessment for each phase of the project, monitor incidents and accidents and preparing regular reports on such monitoring. ESS4 also provides guidance on emergency preparedness and response.</p>	<p>has merged all provisions in the criminal code, ordinances, legislative and executive instruments, acts, bye-laws of the District Assemblies etc. The Act enjoins the provision of sanitary stations and facilities, destruction of vectors including mosquitoes, protection of water receptacles and the promotion of environmental sanitation.</p>		<p>organisation (NADMO) and Ghana National Fire Service are represented in the zonal TCOs and have the responsibility to deal with emergency issues e.g. bushfires, flooding etc.</p>
<p><b>ESS 5: Land Acquisition, Restrictions on Land use and Involuntary Resettlement</b></p>				
<p><b>-To avoid involuntary resettlement or when unavoidable, minimize by exploring project design alternatives</b>  <b>- To avoid forces eviction</b></p>	<p>ESS5 recognizes that project related land acquisition and restrictions on land use can have adverse impacts on communities and persons. For those without formal rights to</p>	<p>No constitutionally or legislatively recognized resettlement rights or assistance for those without recognized (formal) rights to land</p>	<p>Bank Policies provide for compensation for all category of land users Ghanaian laws do not.</p>	<p>The Project by design do not anticipate any form of displacement (physical or economic) in implementing its activities. For land donated for community infrastructure the proponent will</p>

<p><b>- To mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use.</b></p>	<p>lands or claims to such land that could be recognized under the laws of the country, the government should provide resettlement assistance in lieu of compensation for land to help livelihoods improve or at least restore those affected person. Implement all relevant resettlement plans before project completion and provide resettlement entitlements before displacements or restriction of access.</p>			<p>conduct due diligence in accordance with the World Bank's Voluntary Land Donation Protocol; secure the World Bank's clearance to accept the donations; draft an ESS 5-complaint land agreement discuss agreement with traditional authorities in charge of land; explain content of agreement to the community members, and then execute the agreement between the proponent and the traditional authorities responsible for land.</p>
<p><b>ESS6: Biodiversity Conservation and Sustainable Management of Living Natural Resources</b></p>				
<p><b>- To protect and conserve biodiversity and habitats. • To apply the mitigation hierarchy and the precautionary approach in the design and</b></p>	<p>ESS6 promotes the conservation of biodiversity or natural habitats and supports the protection and maintenance of the core ecological functions of</p>	<p>The 1994 Forest and Wildlife Policy was revised in 2011 and subsequently approved in 2012 aims at the conservation and sustainable development of</p>	<p>All national laws relate to protection and management of forest and wildlife and not biodiversity holistically</p>	<p>The project implementing agencies in collaboration with PCU will take measures to protect and conserve biodiversity and habitats and all requirements</p>

<p><b>implementation of projects that could have an impact on biodiversity.</b></p> <p><b>- To promote the sustainable management of living natural resources.</b></p> <p><b>- To support livelihoods of local communities, including Indigenous Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities.</b></p>	<p>natural habitats and the biodiversity they support. It also encourages projects to incorporate into their development, environmental and social strategies that address any major natural habitat issues, including identification of important natural habitat sites, the ecological functions they perform, the degree of threat to the sites, and priorities for conservation.</p>	<p>forest and wildlife resources for the maintenance of environmental stability and continuous flow of optimum benefits from the socio-cultural and economic goods and services that the forest environment provides to the present and future generations, whilst fulfilling Ghana's commitments under international agreements and conventions.</p>		<p>specified in the ESS6</p>
<p><b>ESS8: Cultural Heritage</b></p>				
<p><b>- To protect cultural heritage from the adverse impacts of project activities and support its preservation.</b></p> <p><b>- To address cultural heritage as an integral aspect of</b></p>	<p>This standard sets out general provisions on cultural heritage preservation and recommends protecting cultural heritage from the adverse impacts of project activities.</p>	<p>The Fourth Republican Constitution (1992) recognizes culture as a necessary tool for national integration and development and, under the Directive Principles of State</p>	<p>The regulations and policies do not address cultural heritage as an integral part of sustainable development and promotion of equitable sharing of benefits</p>	<p>The National commission on culture provides a platform for collaboration with Chiefs, opinion leaders and community representatives and other institutions to protect cultural</p>



<p><b>sustainable development.</b>  <b>- To promote meaningful consultation with stakeholders regarding cultural heritage.</b>  <b>- To promote the equitable sharing of benefits from the use of cultural heritage.</b></p>	<p>It addresses physical or tangible cultural resources, which are defined as movable or immovable objects, sites, structures, groups of structures, and natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be in urban or rural settings, and may be above or below ground, or underwater. It also addresses intangible cultural heritage such as practices, representations, expressions, instruments, objects and cultural spaces that communities recognize as part of their cultural heritage. Projects</p>	<p>Policy (Article 39), declares as follows:  “(1) Subject to clause (2) of this article, the State shall take steps to encourage integration of appropriate customary values into the fabric of national life through formal and informal education and the conscious Introduction of cultural dimensions to relevant Aspect of national planning.  (2) The State shall ensure that appropriate customary and cultural values are adapted and developed as an integral part of the growing needs of the society as a whole; and in particular, that traditional practices which are injurious to the health and well-being of the person are abolished.  (3) The State shall foster the</p>	<p>assets. The project will go by the procedures outlined by the Commission in respect of cultural assets. The project will also go the extra mile to complement this collaboration with stakeholder engagement procedures enshrined in the SEP to educate communities to appreciate the role of cultural values and assets in sustainable development and also the need to share benefits accruing from the use of cultural assets.</p>
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	<p>involving significant excavations, demolition, movement of earth, flooding, or other environmental changes are to take cognizance of this standard in the ESMF.</p>	<p>development of Ghanaian languages and pride in Ghanaian culture. - The Ghana cultural policy (2004) enjoins the National Commission on Culture to undertake the following actions to protect and preserves monument, forests reserves, national parks and recreational facilities</p>		
<b>ESS10: Stakeholder Engagement and Information Disclosure</b>				
<p><b>- To establish a systematic approach to stakeholder engagement that will help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties. To assess the level of stakeholder</b></p>	<p>ESS10 seeks to encourage open and transparent engagement between the Borrower and the project stakeholders (project-affected parties) throughout the project life cycle. The standard establishes a systematic approach to stakeholder engagement that potentially helps</p>	<p>The key laws most relevant to stakeholder engagement are: - Article 21(1) (f) of the 1992 Constitution of Ghana which recognizes the right to information for all citizens as a fundamental human right. To fully operationalized the right to information, people need to be</p>	<p>The national regulations and policies do not have structures through which grievances could be addressed and also mechanisms to disclose or disseminate information to the required audiences</p>	<p>- The project has developed a stakeholder Engagement Plan. The SEP also includes a GRM based on an existing grievance redress mechanism for resolving grievances for the Sustainable Land and Water Management Project (SLWMP). The GRM is a decentralized and transparent system which ensured</p>

<p><b>interest and support for the project and to enable stakeholders' views to be taken into account in project design and environmental and social performance</b></p> <p><b>- To promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life-cycle on issues that could potentially affect them.</b></p> <p><b>- To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format.</b></p> <p><b>- To provide project-affected</b></p>	<p>the Borrower to identify stakeholders and build and maintain a constructive relationship with them, as well as disclose information on the environmental and social risks and impacts to stakeholders in a timely, understandable, accessible and appropriate manner and format. It recommends that stakeholder engagements are commenced as early as possible in the project development process and continued throughout the lifecycle of the Project. This allows for stakeholders' views to be considered in the project design and environmental and social</p>	<p>effectively engaged and provided with information on issues that affect their lives.</p> <p>- <i>The Right to Information Act, 2019 (Act 989)</i>, which was also passed into law in 2019 by Ghana's parliament is meant to put into effect the aforementioned article in the constitution of the Republic of Ghana.</p> <p>- <i>Articles 40 to 48 of the Local Governance Act, 2016 (Act 936)</i>, mandate local authorities to create opportunities for residents and other stakeholders to access information and to participate in decision making.</p> <p>- Stakeholder engagement is an integral part of the Environmental Impact</p>		<p>quick resolution of complaints and disputes, it also has the structure for disclosing vital information to requisite stakeholders</p> <p>- It also provides means for effective and inclusive engagement This instrument which satisfy almost all the requirements of ESS 10 will jealously be applied during project implementation to bridge the gaps in national regulations and policies</p>
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<p><b>parties with accessible and inclusive means to raise issues and grievances, and allow Borrowers to respond to and manage such grievances.</b></p>	<p>performance. The Borrower is also expected to implement a grievance mechanism to receive and facilitate resolution of concerns and grievances.</p>	<p>Assessment process. <i>Ghana Environmental Assessment Regulation LI 1652 (1999)</i>, as amended (2002), requires effective public consultation and participation as an integral component of Environmental and Social Impact Assessment (ESIA) procedures</p> <p>- Strategic goal 4 of the National Environmental Policy, which focuses on participation and coordination in environmental governance, charges the lead institutions in environmental governance to ensure active participation in all environmental matters.</p>		

## 2.7 World Bank Environmental, Health and Safety Guidelines

The Environmental, Health and Safety (EHS) Guidelines are technical reference documents that address IFC's expectation regarding the industrial pollution management performance of projects. This information supports actions aimed at avoiding, minimising, and controlling EHS impacts during the construction, operation, and decommissioning phase of a project or facility. In the context of the proposed project, the most relevant EHS Guidelines to be considered are:

- World Bank Group General EHS Guidelines (2007);
- World Bank Group EHS Guidelines for Construction Materials Extraction (2007)

Guidance provided in the General EHS Guidelines will be applicable in the areas of environment, occupational Health and Safety, Community Health and Safety, and Construction and Decommissioning.

Section four of the General EHS Guidelines focuses on construction and decommissioning of infrastructure. During the construction through to the decommission phase, cognizance will be taken of the specific directives for construction and align mitigation of risk and impact measures alongside with the specific performance indicators. Key issues to be considered include the following

### a. Environment

- Noise and Vibration
- Soil Erosion
- Air Quality
- Solid Waste
- Wastewater Discharges

### b. Occupational Health and Safety

### c. Community Health and Safety

- General Site Hazards
- Disease Prevention
- Traffic Safety

## International Conventions and Requirements

Healthy ecosystems and forests play an important role in the resilience of local communities. Sustainable forest management and access to services and benefits from forests and wildlife PAs can help vulnerable communities better absorb and adapt to the impacts of shocks and stressors, among them climate change. Ghana's NDC to the Paris Climate Agreement place a strong

emphasis on adaptation to ensure that all people and communities are resilient to climate impacts. Sustainable land use, including food security and sustainable forest management have been identified as two priority sectors in the NDC.

Table 2-5 below summarizes the international and regional treaties, conventions and protocols to which the Government of Ghana is a signatory and identifies those aspects of the Project where they may be relevant.

Table 2-5 : International Treaties, Conventions and Protocols Applicable to Project

Treaty/Convention/ Protocol	Objective	Relevance to the Project
Convention on Biological Diversity (CBD) (1992)	Preserving and sustaining biological diversity.	Biodiversity studies and management/preservation
Convention on Migratory Species (CMS) of Wild Animals (1983)	An international regime for the protection of migratory animals and their habitats, and the prevention, reduction and control of factors that endanger them.	Biodiversity studies and management of migratory species of wild animals.
Convention on Wetlands of International Importance especially as Waterfowl Habitat (Ramsar Convention) (1993)	To conserve and protect the wise use of wetlands through local, regional and national actions and international cooperation.	The project will ensure that contractors during construction works and other operations (carting of scooped earth) for waterholes sites close to wetlands are well managed to preserve them to augment water volumes of these water systems.
Vienna Convention for the Protection of the Ozone Layer	Protection of the Ozone Layer	Compliance with standards and protocols by limiting biodiversity destruction during construction activities and use of obsolete equipment.
United Nations Framework Convention on Climate Change (1992)	The reduction of negative changes to the earth's climate, with focus on greenhouse gases. Places focus on industrialized countries to reduce emissions. Developing countries like Ghana are currently exempt from the reduction requirement; however, this may change	Manage GHG emissions associated with the Project.

Treaty/Convention/ Protocol	Objective	Relevance to the Project
Convention Concerning the Protection of the World Cultural and Natural Heritage (World Heritage Convention), Paris (1975)	International Convention to identify and conserve the world's cultural and natural heritage	Protection of natural heritage and zones of cultural influence within the Project area. There was no indication of existence of Cultural heritage in the project area during initial screening and consultations
Convention Concerning the Protection of Workers Against Occupational Hazards in the Working Environment due to Air Pollution, Noise, and Vibration (ILO No. 148)	The Convention encourages that employers in consultation with their workers understand project hazards related to air pollution, noise pollution, and vibrations	Project occupational health and safety
<b>Convention on the Rights of the Child (CRC)</b>	Provides the standards for protecting children from all forms of exploitation and abuse	The project will protect children from exploitation and abuse
ILO Conventions 182 and 138	Defines and prohibits the worst forms of child labour, and defines the minimum age for light work and employment.	The project will ensure age verification of workers and that child labor is prevented, and in case identified, is remediated in accordance with standards set in the CRC and the Children's Act, 1998 Amended in 2016 (Act 937)
African Convention on the Conservation of Nature and Natural 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 program	This project is providing a number of interventions that would promote conservation and the sustainable use of natural resources.

Treaty/Convention/ Protocol	Objective	Relevance to the Project
Universal Declaration on Human Rights	<p>The law provides for the promotion of respect for rights and freedoms and for progressive national and international measures to secure the effective recognition and observance among people of signatories themselves and among the territories under their jurisdiction. Key provisions include:</p> <p>Article 19: Everyone has the right to freedom of opinion and expression.</p> <p>Article 20: (1) Everyone has the right to freedom of peaceful assembly and association. (2) No one may be compelled to belong to an association.</p> <p>Article 24: Everyone has the right to rest and leisure, including reasonable limitation of working hours and holidays with pay</p>	<p>Employment (conditions of engagement, safety of work environment, etc.) or management of labour issues and protection of worker welfare would be promoted during project activities.</p>
Arhaus Convention on Public Access to Information and Participation in Decision Making and Access to Justice in Environmental Matters (1998)	<p>Protection of the right of present and future generations to live in an environment adequate to their health and well-being. Each party would promote the rights of access to information, public participation in decision-making and access to justice in environmental matters in accordance with the provision of this Convention.</p>	<p>Enhance Project information disclosure, public consultation and stakeholder engagement for the Project</p>



### 3.0 PROJECT DESCRIPTION AND ALTERNATIVES

#### 3.1 Proposed Civil Works

The specific civil works for which this ESIA Studies covers are Civil Works in/around the Digya National Park in the Sene West, Sene East, Sekyere Afram Plains, Kwahu Afram Plains North and Kwahu Afram Plains South of the Bone East, Ashanti and Eastern regions. They include the following

- Cassava Mini Processing Facility (Lassi)
- Cassava Mini Processing Facility (Koranten)
- Cassava Mini Processing Facility (Deefour)
- Dugout (livestock Watering) at Nsoyanafour
- Mechanised Solar powered Bore hole and Toilet facilities at Dome
- Mechanised Solar powered Bore hole and Toilet facilities at Agoam-Saabuso
- Observation Tower and Safari Trails for Game Viewing at Tato Camp
- Waterhole and Observation tower at Apapasu
- Waterhole and Observation tower at Nsoyaso Beat

The proposed interventions may likely have both positive and negative environmental and social impacts and therefore environmental and social due diligence is to be conducted in accordance with Environmental Assessment Regulations (LI 1652) and relevant World Bank Environmental and Social Standards

#### 3.2 Description of Proposed Works Locations

The proposed civil works listed above will be located in the Digya National Park and selected fringe communities

Table 3-6: Civil Works in/around DNP and Site Characteristic

S/N	Site/Community	District	Proposed Civil works	Site Characteristics
1.	Dome Settlement (Digya National Park)	Sekyere Central	a. Solar Powered Borehole	Generally flat terrain
		Sekyere Central	b. Toilet facilities	Bare land

2.	Agoam Saboso (Fringe Community)	Sekyere Afram Plains	a. Solar Powered Borehole	The site has some trees and shrubs
			b. Toilet facilities	The site has some trees and shrubs
3.	Apapasu (Digya National Park)	Sekyere Afram Plains	a. Waterhole b. Observatory Tower	The site is undulating (close to the Tato range) and close to the Sene River which serves as elephant pool
4.	Tato Camp (Digya National Park)	Sekyere Afram Plains	a. Observatory Tower b. Develop Safari Trails for Game Viewing	The site is wooded and overlooking the Sene River
5.	Nsogyaso Beat ( Digya National Park)	Kwahu Afram Plains South	a. Observatory Tower b. Waterhole	The site is covered with trees and overlooks the existing pool
6.	Lassi (CREMA Community)	Sene West	Mini Cassava Processing plant	Generally flat terrain with trees and shrubs
7.	Koranten (CREMA community)	Kwahu Afram Plains South	Mini Cassava Processing plant	Generally flat terrain with trees and shrubs
8.	Deefour (CREMA community)	Sene East	Mini Cassava Processing plant	Generally flat terrain with trees and shrubs



### 3.3 Description of Project Civil works

#### 3.3.1 Water Systems

A total of five (5) water systems (One (1) dugout, two (2) waterholes and two (2) mechanised boreholes) will be constructed. The dugouts and waterholes will be designed to have the minimum depth required to render a water point permanent and can vary according to its size and circumstance, but for small to medium sized water points the depth must be at least 4 m deep in order to support the loss of depth and volume due to seepage and evaporation, the consumption by animals that will concentrate around the water hole and provide residual depth of at least 50 cm in order to avoid the growth of algae that renders the water unwholesome for animals at the end of the dry season. The dugout will be the generic cleaned (waterhole) type. The mechanized boreholes will be designed to be powered by solar panels.

#### 3.3.2 Game Viewing Platforms/Observatory towers

The Wildlife Division has an existing Game Viewing Platforms (See figure 3-2 below) at Gbele Resource Reserve and Mole National Park which are designed with the following technical details and would serve as a guide to improve those to be constructed within the Digya National Park under the GLRSSMP

- a. Reinforced Concrete Structure
- b. Height is at about 4.5 meters
- c. The structure's platform is about 6 meters high
- d. Concrete stools to enable the Forest Guards to be able sit for meetings

The proposed platforms to be constructed will have the following features to allow tourist/guest who may be interested in wildlife viewing, photography and at the same time environmentally friendly to have the maximum satisfaction

- a. Structure to be between 4.5 meters and 6.0 meters
- b. Power Supply from Solar Cells
- c. Rainwater harvesting with reasonably sized holding tanks
- d. A borehole would be done to complement water supply during the dry season.
- e. Sanitary facilities for Forest Guards and Guests
- f. Good seating facilities to enable meetings for Forest Guards and Guests
- g. Facilities to enable photography.



Figure 3-2: Existing Game Viewing Platform at Gbele Resource Reserve

### 3.3.2 Mini Cassava Processing and Other Facilities

The processing facilities will consist of buildings that house processing machines, including a motorised grater, wooden fermentation racks, presses for de-watering cassava mash, mechanical sifters, improved roasting bays, grinder, bag stitching machine and weighing scales. The motorised grater has a capacity of 2 tonnes/hour. These facilities will be powered by electricity or gas. Wherever gas will be used management of the facility at communities the PCU will engage an LPG expert to educate them on these precautions:

- Ensuring adequate ventilation and not using it indoors or confined spaces
- Reading and applying manufacturers operating instructions
- Disconnecting cylinders near naked flames
- LPG should not be used in windy conditions
- Keeping cylinders cool and away from flames, sparks and heat sources.

### 3.3.3 Solar Powered Borehole and Toilet Facilities

The borehole will be drilled based on the hydrogeology of the selected site and recommendation of the Water Resources Commission. It will then be pumped into an overhead tank using solar energy. The toilet facilities will contain basic facilities such as water closets and wash hand basins, with separate sections for males and females. The treatment method will be either bio fill or digester depending on water table of the area.

### 3.4 Man Power Requirements

The Contractor for each of the facilities shall employ the key Personnel and use the equipment identified in its Bid, to carry out the works or other personnel and equipment approved by the Project Manager. The Project Manager shall approve any proposed replacement of key personnel and equipment only if their relevant qualifications or characteristics are substantially equal to or better than those proposed in the Bid.

The contractor will employ unskilled labour from the beneficiary communities/fringes around the Digya National Park in order to reduce cost of accommodation and transportation which will be incurred if such labour are hired from outside the community as well as create some employment opportunities which will improve their livelihoods. Manpower (number of workers) both skilled and unskilled will be determined by the Contractor, however, labour required for each activity per site is estimated as follows:

Table 3-7 : Workforce estimates for sub-projects

Construction Activity	Estimated No. of Workers
Dugout	12
Game Viewing Platform	7
Processing Facility	10
Borehole	6
Toilet Facilities	6
Total	41

### 3.5 Alternatives Considered

The Ghanaian EA Regulations LI 1652 of 1999 require the provision of an outline of the main alternatives considered with the main reasons for the choice selected. This section provides a full description of the process followed to select the proposed preferred activity, technology, site and location within the project site, including details of all the alternatives considered

In order to achieve the goals and objectives of the GLRSSMP, alternatives analysis of the proposed investments that would meet the expected objective developing the infrastructures have been considered.

As part of the alternative analysis of the proposed investments the following were considered:

- location/site,
- design,
- technology/resource management strategy and
- Operational alternatives vis-à-vis baseline information.
- No action scenario

#### 3.5.1 Identified Alternatives

##### 3.5.1.1 *Location/Site Analysis*

#### **Water Systems**

The water systems will be located in the Digya National Park and its fringe communities. Evaluations have been made to propose the actual location of each site, choose, to confirm or re-select the best-fit model that may be proposed for that specific site and determine precisely the site's physical characteristics such as soils and dimensions of the drainage.

For sites of optimized dugouts and the river weir, the drainage characteristics such as the size of the drainage basin, average rainy-season flows, 5-year, 10-year and 50-year peak flows have been calculated, the width and height of the spillway and of the freeboard between the spillway level and the dike have been calculated so that the structure will accommodate the highest flows without endangering the structure's integrity. These parameters were critical in selecting the site. The siting of the water holes in the park were based on tourist optimization i.e. close to the viewing platforms where more wildlife will congregate.

### 3.5.1.2 Design Analysis

#### Water Systems

The different models for construction of waterholes and their fringe community range from cleaning and deepening old natural ponds that are no longer permanent, digging new artificial ponds or dugouts, constructing small dams that will provide substantial depth and volumes of water as well as develop community fishing, larger dams for community areas, as well as in Protected Areas (PA) where biodiversity conservation considerations can be important, to weirs and spillway dikes across seasonal rivers.

The following options were considered for the various site

1. **“Cleaned” dugouts:** in the national parks where ecological and touristic considerations are important (dumping excavated earth away from the dugout so as to avoid: 1) transport back into the pond by rain or elephant, 2) carnivores on the earth-pile ambushing drinking animals, and 3) the unseemly pile of earth with an “unfinished” look, inimical to international tourism). This model is 4 m deep, 50 m wide at the surface and 10 m wide at the bottom, with 20% (1/5) slopes that permit wildlife to descend to drink as the water level reduces during the dry season, and at the beginning of the dry season retains about 3,570 m<sup>3</sup> of water. This option is selected for the water holes in the park
2. **“Optimized” dugouts:** in community areas to provide the most cost-efficient structure for water supplies that will be adequate for multiple community uses of cattle watering, fishing and/or gardening, where the full potentials of given sites can be attained through the use of relatively low but wide bulldozer-packed dikes to impound and send the outlet flow over a laterite shield lining the drainage that can serve as a natural and inexpensive anti-erosion structure. This option will be used for the dugout in the fringe communities
3. **“Non-cleaned” dugouts:** (earth classically piled to the side of the dugout) in community areas where none of the local drainages fit the profile required for optimization. As an alternate model for the same cost as an optimized dugout where the terrain is not conducive to an optimized dugout, the average non-cleaned dugout will be designed to provide at least 6,000 m<sup>3</sup> of water. This model may be used as a secondary option for the optimized dugout in fringe communities

#### Game Viewing Platforms/Observatory towers

The main alternatives considered for the design of the platforms are the materials and the height. Options for the material was either a concrete or wooden structure. Each of these have their merits whiles the concrete is economically expensive, it will last longer than a wooden structure though cheaper due to the temperature conditions. The option selected was therefore a concrete platform with stone cladding or a suitable paint to blend with the environment. . The choice for this option



was also based on its durability compared to old existing wooden structures which are out of use at the moment. The height alternative was based on structural integrity and most importantly tourist ability to view game. The optimum height selected that will not be too short or too tall was 4.5m.

#### Mini Cassava Processing Facilities

The main alternatives considered for the design of the housing for the processing facility are the materials and the purpose for the use of the processing machine. The option for the material was either sand block or bricks. The use of each of these materials have their merits, whilst the bricks may be expensive there will be no need to paint the structure. The use of the processing machine could be single purpose i.e. for processing of cassava only or multi-purpose i.e. processing of cassava and other cereals. Even though the multi-purpose facility will be more expensive beneficiaries will derive more benefits and this was selected as the best option.

### *3.5.1.3 Technology/Resource Analysis*

#### **Water Systems**

Two bulldozers will be used at each site at the same time. Another possible measure to accelerate the construction of the proposed water facilities will be to bring in and use more than 1 bulldozer at each pond or dugout. This would also help to continue the cadence if a machine breaks down (as some inevitably will, needing to be as rapidly as possible repaired or replaced).

#### Borehole

Mechanizing the boreholes to pump water into an overhead tank was considered to be critical for the operation of the toilet facilities. However, there were alternatives for the energy to be used i.e., electricity from national grid or from solar cells. Connecting the national grid to the facility was evaluated to be more expensive and challenging including operational phase cost. Though the initial set up for the solar panels was high, it was evaluated to be the best alternative considering low management cost at operational phase and its sustainability.

### *3.5.1.4 Do-Nothing Alternative*

Among the goals of the GLRSSMP is to strengthen integrated natural resource management and increase benefits to communities in targeted savannah and cocoa forest landscape. It is evident that doing nothing with respect to the proposed civil works in and around the Digya National Park and its fringes will not bring about the expected socio-economic development and improvement in

wildlife as well as boosting ecotourism. There will be significant negative effects on biodiversity, communities will be deprived of the expected benefits an outcome much worse than the impacts of the proposed projects activities such as the dugout and game viewing platforms. The do-nothing alternative is therefore not an option.

## 4.0 ENVIRONMENTAL AND SOCIAL BASELINE INFORMATION

### 4.1 Introduction

Digya National Park<sup>1</sup> is the second largest national park and the oldest protected area in Ghana. It is located in the Bono East Region. It was created in 1900 and given national park status in 1971. The park is the only wildlife territory in Ghana to have Lake Volta at its borders.

Digya National Park (DNP) lies largely within the Sene District of the Brong Ahafo Region. It also stretches into the Sekyere West and Afram Districts of the Ashanti and Eastern Regions respectively (Figure 4-1). It is situated between the latitudes 7°06' and 7°44'; North and longitudes 0°06' and 0°42' west and covers an area of 3478.5 km<sup>2</sup>. Three quarters of the DNP is bounded by water; on the north by the Sene River, on the east by the Volta Lake and on the southeast by the Obosum River.

Digya National Park was created in 1900 as a protected area, the first in Ghana. It was acquired by the government and gazetted as a national park in 1971. When the government acquired the park, there were living settlements in the park, with most of the residents being fishermen and farmers. In 2006, there were 49 settlements and the government of Ghana began evicting settlement residents from the park, currently eighteen settlements are within the park. In early 2005, a patrol-based system was established in the park to curb illegal activity

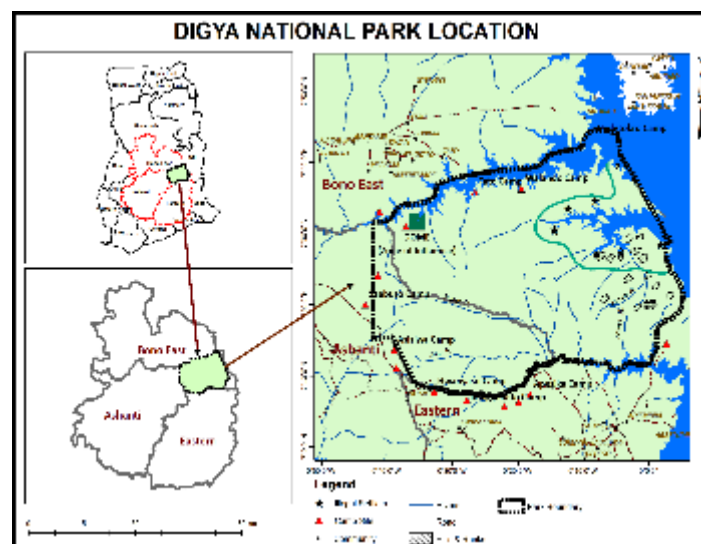


Figure 4-1 : Location Map of Digya National Park

<sup>1</sup> : [https://en.wikipedia.org/wiki/Digya\\_National\\_Park](https://en.wikipedia.org/wiki/Digya_National_Park)

## 4.2 Climate

Digya National Park experiences an annual cycle of rainfall that is transitional in nature. The annual rainfall in the 70's from March to October averaged 1375mm, (Happold, 1973). This is comparable to the mean annual rainfall for Atebubu (1269.6mm) and Kete Krachi (1370mm) as recorded by the Meteorological Service Department (DNP Management Plan).

## 4.3 Geology, Soils, Topography and drainage

The reserve is underlain geologically by the Voltaian system of late Precambrian to Palaeozoic age (300-1,000 M yrs). The Voltaian sandstone basin is made up of gently dipping or flat-bedded sandstone, shale and mudstone (Dickson and Benneh, 1988).

Generally the soils of Digya National Park are similar in appearance to the soils of much of the transitional savanna-forest zone. They are mainly savanna ochrosols (Brammer, 1956,1962) or Haplic Acrisols (FAO/UNESCO, 1988). Savanna ochrosol - Groundwater Laterites or Haplic Acrisols - Plinthic Ferrasols are found between the Digya and Obosum arms of the Volta lake whilst the soils along the streams and rivers are Savanna Gleisols or Dystric Gleysols. It is well-attested that the relatively deep savannah ochrosols of the Voltaian sandstone in Gonja and Dagomba have long been the leading areas in Ghana for the production of yam, guinea corn and millet (Figure 4-2).

The elevation of Digya National Park lies between 2760ft (lake level) and 5000ft above sea level. The park can be divided into two topographic sections. The northern and north-western parts (Sene areas) is covered by undulating flat lands whilst the eastern section (Ntonaboma area) is covered with sandstone outcrops. The overall drainage of the park is into the Volta Lake by way of the Sene, Digya and Obosum rivers (Figure 4-3). The rivers and streams in the heart of the park dry up during the dry season

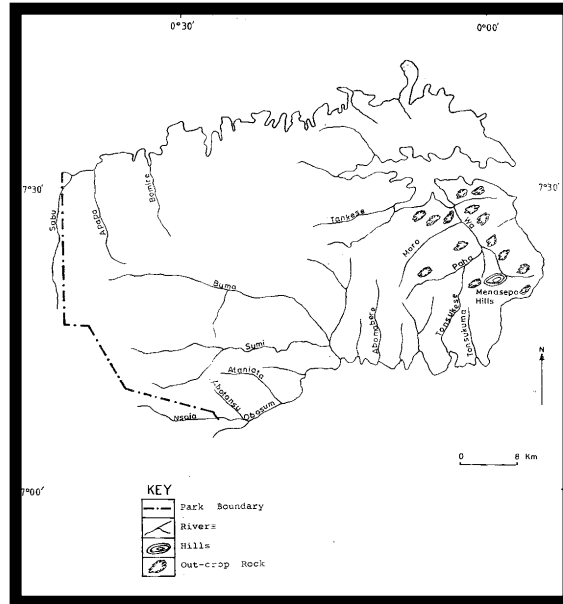
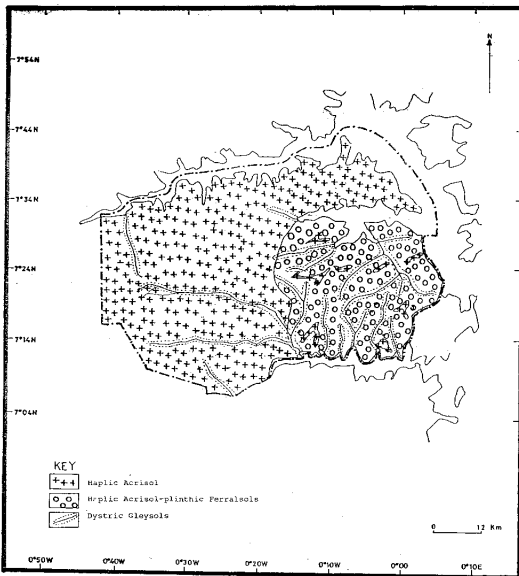


Figure 4-2 : Soil Map of the DNP

Figure 4-3 : Relief and Drainage Map of Digya National Park

#### 4.4 Vegetation and Animal Species

##### 4.4.1 Vegetation

In a full account of the vegetation of the park by Schmitt and Adu-Nsiah (1994), four main groups have been distinguished: Tall-grass savanna, Boval vegetation, Riparian forest and Aquatic vegetation (Figure 4-4). According to Management the Digya National Park as a recognized protected area has no classified areas, recognized Wetlands or Ramsar sites, generally is a natural habitat and no critical habitats exists around the sub-projects areas. Similar sub-projects i.e. dugouts were constructed during the erstwhile Sustainable Land and Water Management (SWMP) and implementation activities did not have any significant adverse environmental and social impacts due to the mitigation measures put in place. The proposed mitigation measures will also be implemented to ensure that implementation activities will not pose threat to the ecosystem.

##### Tall- grass or Guinea Savanna

The tall-grass savanna supports typical fire controlled tree savanna community of broad-leaved deciduous trees. They are densely distributed in a continuous ground cover of perennial bunch grass and associated forbs. Their spreading crowns reach a height of 12-15m but seldom form a close canopy except over small areas. Typical trees and shrubs include *Lophira lanceolata*, *Terminalia avicennioides*, *Vitellaria paradoxa*, *Daniellia oliveri*, *Borassus aethiopum*, *Burkea*

*africana*, *Combretum fragrans*, *Annona senegalensis*, *Maytenus senegalensis*, *Bridelia ferruginea*, *Hymenocardia acida* and *Parinari polyandra*. The characteristic bunch grasses include *Hyparrhenia subplomosa*, *H. rufa* and *Andropogon gayanus*.

**Boval vegetation:** This comprises all plant communities on sandstone outcrops with shallow soils in the eastern and south-eastern parts of the park. The characteristic vegetation is made up of annual grasses and low herbs in soils between the sandstone outcrops

**Riparian forest:** This type of forest is found on the seasonal watercourses, depression and other sites where the ground water table is high enough to sustain forest vegetation throughout the dry season. These narrow bands of species-rich plant community may grow up to 20 (25)m. high. Tree species commonly encountered here are *Erythrophleum ivorense*, *Manilkara multinervis*, *Cola gigantea*, *Ceiba pentandra* and *Azelia africana*.

**Aquatic Vegetation:** The Digya arm and Sene portions of the Volta lake have a zone of land averaging about 25m wide which is covered and uncovered each year by water as a result of the annual fluctuating water level of the Volta. Three specific plant communities have been identified to be associated with this type of regime.

- a. Sedge Zone; dominated by annual species of *Cyperus*, *Fimbristylis* and *Ludwigia* on land exposed above water for about 10 weeks in a year
- b. Perennial grass/polygonum zone; where the land is exposed for 10 to 35 weeks a year. Floating grasses such as *Brachiaria mutica*, *Leptochloa caerulea*, *Polygonum senegalense* and *Vossia species* are found.
- c. Annual forbs zone; consists of broad-leaved herbs (forbs) of the genera *Tephrosia* and *Indigofera*. This area is out of water for more than 35 weeks. Perennial grasses like *Imperata cylindrica*, *Hyparrhenia subplomosa* and *Hyperthelia dissoluta* can be found

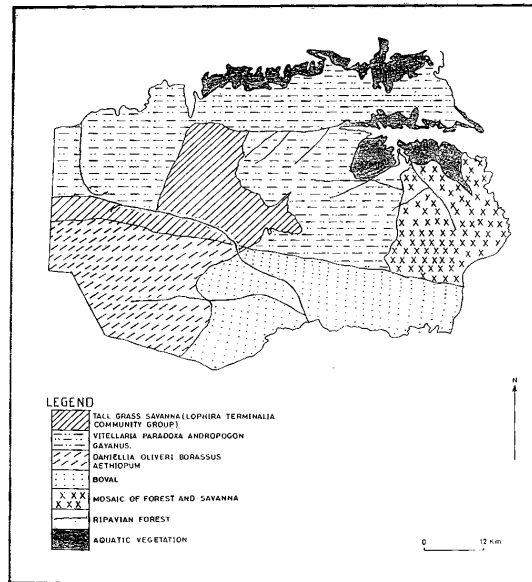


Figure 4-4 : Vegetative Map

#### 4.4.2 Fauna

A fauna baseline survey conducted in 2022 by Wildlife Division and the Resource Management Support Centre of the Forestry Commission as part of the development of the Digya National Park Management plan revealed the following fauna in the DNP

#### 4.4.3 Mammals

The survey recorded one thousand seven hundred and twenty-five (1725) mammals consisting of thirty-three (33) species belonging to eight (8) orders from fourteen (14) families, of which nine (9) species are of global conservation concern according to the IUCN Red List of threatened species (2022). The s fourteen (14) mammal families namely: Bovidae, Cercopithecidae, Viverridae, Manidae, Suidae, Herpestidae, Elephantidae, Leporidae, Barthyergidae, Hystricidae, Nesomyidae, Sciuridae, Thryonomyidae and Orycteropodidae. The Bovidae family (cloven-hoofed, ruminant mammals) recorded the highest number of species followed by Cercopithecidae (primates), Viverridae (filiform mammals), Manidae (pangolins), Suidae (pigs), Herpestidae (mongooses) and so on. ..The ten most abundant mammal species recorded included; Bushbuck (*Tragelaphus scriptus*) Red River Hog (*Potamochoerus porcus*) Patas Monkey (*Erythrocebus patas*), Kusimanse Mongoose (*Crossarchus obscurus*), Grass Cutter (*Thryonomys swinderianus*), Red-flanked Duiker (*Cephalophus rufilatus*), African Bush elephant (*Loxodonta africana*), Common Warthog (*Phacocoerus africanus*), Waterbuck (*Kobus ellipsiprymus*) and Maxwell's Duiker (*Philantomba maxwelli*). The Bushbuck was the most abundant species in the Park, with a

relative abundance of 16.81. It also recorded the highest encounter rate of 6.04 signs/ km) followed by the Red river hog. The survey recorded nine (9) mammal species listed on the International Union for the Conservation of Nature (IUCN) Red List of threatened species (2022) namely: Ursine Colobus (*Colobus vellerosus*)-Critically Endangered (CR), African Bush Elephant (*Loxodonta africana*)-Endangered (EN), Giant Pangolin (*Smutsia gigantea*)-Endangered (EN), Tree Pangolin (*Phataginus tricuspis*)-Endangered (EN), Long-Tailed Pangolin (*Phataginus tetradactyla*)-Vulnerable (VU), Patas Monkey (*Erythrocebus patas*) - Near Threatened (VU), African Buffalo (*Syncerus caffer*)-Near Threatened (NT), Bongo (*Tragelaphus eurycerus*) - Near Threatened (NT), and Mona Monkey (*Cercopithecus mona*)-Near Threatened (NT).

#### 4.4.4 Birds

The survey recorded two thousand one hundred and eighty (2180) individual birds belonging to one hundred and ninety-three (193) species from fifty-eight (58) families (Table 2). One thousand five hundred and thirteen (1513) birds representing sixty-nine percent (69%) were recorded by sight and six hundred and sixty-seven (667) birds representing thirty-one percent (31%) were recorded by vocalization (call or song) and the ten most abundant non-wader species were the White-faced Whistling Duck (*Dendrocygna viduata*), Great Egret (*Egretta alba*), Spur-winged Lapwing (*Vanellus spinosus*), Red-eyed Dove (*Streptopelia semitorquata*), Yellow-fronted Canary (*Serinus mozambicus*), Bronze Mannikin (*Spermestes cucullatus*), African Jacana (*Actophilornis africanus*), Village Weaver (*Ploceus cucullatus*), Common Bulbul (*Pycnonotus barbatus*), and the White Helmet shrike (*Prionops plumatus*). The Bateleur (*Terathopius ecaudatus*) listed as Endangered (EN) on the IUCN Red List of threatened species (2022) was recorded during the survey. The Park, which is strategically flanked by the Volta Lake as its borders, serve as a habitation for numerous water birds (wetland specialists) who ecologically depend on wetlands for at least part of their annual cycle of which the ten most abundant included the Great Egret (*Egretta alba*) Common Moorhen (*Gallinula chloropus*), White -faced Whistling Duck (*Dendrocygna viduata*), African Fin foot (*Podica senegalensis*), Hamerkop (*Scopus umbretta*), Long-tailed Cormorant (*Microcarbo africanus*), Spur-winged Lapwing, (*Vanellus spinosus*), Black Crake (*Zapornia flavirostra*), Grey Heron, (*Ardea cinerea*) and African Jacana (*Actophilornis africanus*).

#### 4.4.5 Reptiles

The survey recorded two hundred and six (206) herptiles consisting of twenty-six (26) species belonging to four (4) orders from seventeen (17) families. The orders consisted of fourteen (14) Squamata, seven (7) Anura, four (4) Testudines and one (1) Crocodylia, The survey recorded seventeen (17) herptiles families namely: Pipidae, Hyperoliidae, Phrynobatrachidae,



Ptychadenidae, Dicroglossidae, Ptychadenidae, Bufonidae, Testudinidae, Pelomedusidae, Agamidae, Scincidae, Varanidae, Elapidae, Chamaeleonidae, Pythonidae, Viperidae, and Crocodylidae. The ten most abundant were the; Central African Rock Python (*Python sebae*), Savanna Monitor (*Varanus exanthematicus*), Broad-banded Grass Frog (*Ptychadena bibroni*), Brown Banana Frog (*Afrivalus dorsalis*), West African Mud Turtle (*Pelusios castaneus*), Slender Chameleon (*Chamaeleo gracilis*), Spotted Savanna Skink (*Trachylepis perroteti*), West African Tree Agama (*Agama paragama*), Ahl's River Frog (*Phrynobatrachus latifrons*) and African Groove-crowned Frog (*Hoplobatrachus occipitalis*) of which five (5) herptiles species listed on the IUCN Red List of threatened species (2022) namely the: Home's Hinge-back Tortoise (*Kinixys homeana*)-Critically Endangered (CR), African Dwarf Crocodile (*Osteolaemus tetraspis*)-Vulnerable (VU), Gaboon Viper (*Bitis gabonica*)-Vulnerable (VU), Ball Python (*Python regius*)-Near Threatened (NT), and Central African Rock Python (*Python sebae*)-Near Threatened (NT). These species along with the Nile Monitor (*Varanus niloticus*) are also listed on schedule I of the Ghana Wildlife Conservation Regulations, 1971 L.I 685.

#### 4.5 Air Quality

Baseline air quality data was collected to understand the level of deterioration or otherwise of the project site. This will help to determine any changes in the quality during the constructional and operational phases of the facilities earmarked for the DNP and communities within and outside. The parameters of concern were Total Suspended Particulates, Respirable Dust (PM<sub>10</sub> and PM<sub>2.5</sub>).

Ambient air quality refers to the standard quality of the air within a defined environment that supports ecosystem functioning. The ambient air quality standards are the concentrations of pollutants in the air, and typically refer to outdoor air. The standards are meant to ensure the protection of human health.

Two (2) sampling locations (north and south) were selected in order to give a fair idea of the air quality in and around the project site. The instrument used was a 224-52TX Air Sampling Pump. The equipment was mounted at about 1.5 meters above the ground. The results of the monitoring are presented in table 4-8 below.

Table 4-8 : Summary Results of Ambient Air Quality Monitoring

Sampling Point	TSP (µg/m <sup>3</sup> )	PM10 (µg/m <sup>3</sup> )	PM2.5 (µg/m <sup>3</sup> )
North	152.2	66.3	31.1
South	122.4	61.2	26.5
<b>GS 1236: 2019 Standard</b>	<b>150.0</b>	<b>70</b>	<b>35</b>

The TSP in the ambient air were found to be slightly above the permissible levels of  $150\mu\text{m}^{-3}$  for a 24-hour averaging time as prescribed in the GS 1236:2019 with values of  $152.2\mu\text{m}^{-3}$  in the north however the south recorded  $122.4\mu\text{m}^{-3}$  which is within the permissible limits.

PM<sub>10</sub> in the ambient air were found to be within the permissible levels in all sampling locations in the north with  $66.3\mu\text{m}^{-3}$  and south with  $61.2\mu\text{m}^{-3}$  as compared to  $70\mu\text{m}^{-3}$  for a 24-hour averaging time as prescribed in the GS1236:2019.

PM<sub>2.5</sub> in the ambient air were also within the permissible levels in all the sampling locations north with  $31.1\mu\text{m}^{-3}$  and south with  $26.5\mu\text{m}^{-3}$  as compared to the ambient air quality standard value of  $35\mu\text{m}^{-3}$  for a 1-hour averaging time prescribed in the GS 1236:2019.

#### 4.6 Ambient Noise

The project location currently has no activity that generate noise which may impact negatively on the environment. The two locations used for the ambient air monitoring were also used for the noise level assessment, i.e., north and south of the project site. The proposed site is a protected area therefore, the assessment was based on the permissible noise corresponding to protected areas in Ghana.

The noise levels were captured in-situ in decibels on the A scale, i.e., dB (A) using a CR: 812B Sound Level Meter. Readings were taken at 1.5 m above ground level for 24 hours, which is for daytime and night time periods. The results of the noise measurement are presented in table 4-9 below

Table 4-9 : Ambient Noise Level Measurements

Location	Leq dB(A) (Day time)	Leq dB(A) (night time)
North	60.2	49.6
South	54.3	48.4
<b>EPA* Standard Value</b>	55	50

Source: Field Data, February, 2024

Leq: The equivalent continuous sound pressure level

EPA\*: Guideline value set for day and night time

The results, presented in Table 4-9, indicate that the measured Integrated Equivalent Noise Levels (Leq) ranged from 60.2 dB(A) to 54.3dB(A) for day time and 49.6 dB(A) to 48.4 dB(A) for night time. Thus, all the baseline noise level measurements fell within the relevant Ghana standard for Health Protection- Requirement for Ambient Noise Control (GS 1222: 2018 and Ghana Standard-

Acoustic Guide for Measurement of Outdoor A-Weighted Sound Levels (GS 1253: 2018) for Educational Institutions except for the day time noise at the northern end. This may be attributed to the movement of vehicles on the access road to the north

#### 4.7 Socio-Economic Setting

There are about an estimated 10,000 to 18,000 people living in 70 communities in and around Digya National Park

Much of the human impact on the Digya National Park is centred on the invasion of the park by farmers and fishermen in the early 80's as a result of numerous vacations of posts by staff. The people that were resettled at the time of the establishment of the park in 1971 re-entered and settled along the shores of the rivers and in the interior of the park. These new communities engaged in fishing, hunting and commercial farming, particularly of yam. These activities were degrading the resource base at such an alarming rate that a second relocation of the settlements was done in 1989. However, even though the relocation was successful, there has been a massive influx of settler farmers and fishermen, particularly into the Digya Arm areas, because of inadequate staff and logistic support. This influx was also made possible because the park was seen as a "common property" where one does not have to go through any traditional rites to settle or farm on. As a result of the influx of settlers the hunting pressure is so intense that the wild animals are almost shot out. The activities of the settlers and hunters, i.e. cutting of trees and bush burning, play an integral part in perpetuating the savanna ecosystem and also have a lot of devastating effects on the forest as well as the local animal and insect populations.

- a. **Roads** - The communities surrounding the park are not readily accessible. Although there are roads linking most of the communities to the major marketing centres and district capitals, only tractors and in some cases big trucks can ply them. The roads become very difficult to use during the peak of the wet season. During such times the southern and parts of Kwahu are inaccessible from the park headquarters due to the flooding of the Sene River at Seneso. Those sections can then only be reached through Kumasi and Nkawkaw. The canoe is the most common means of transport among the communities residing along the Sene, Volta Lake and Digya Arm
- b. **Public Infrastructure**- Public infrastructure such as schools and markets are generally in poor state due to lack of regular maintenance regime. Many of the school buildings are grass roofed and hardly survive more than two rainy seasons. Markets are usually held in the open and under grass roofed sheds with no built structures.
- c. **Water Supply** - Almost all the farming communities depend on running streams that dry up during the dry season. Women from such communities travel long distances to

obtain water for their domestic needs. However the water supply has greatly improved over the last few years with the provision of hand pump-fitted boreholes for some of the communities by World Vision International (W.V.I.) free of charge. The beneficiary communities were made to make a bank deposit of ₵75,000.00 for the future maintenance of the hand pump before drilling of the borehole is begun. One person in each community is trained to undertake minor repairs and maintain the hand pumps. All the communities located along the Volta and its tributaries rely on its water for drinking and other domestic purposes even though there is the danger of contracting bilharzia (shistosomiasis) from it.

- d. Health Status and Facilities** - The health status of the communities within the immediate vicinity of Digya National Park in general is poor (DNP Mangement Plan). Diseases prevalent in the communities include malaria, anaemia and bilharzia. Access to health facilities is very poor particularly in the wet season. Clinic services for the farming communities could be obtained from Anyinofi, Jajaji, Kyeame-krom, Tease, Ekyi, Amanfrom and Kwasi Fante. There are district hospitals at Atebubu and Kwame Danso and also Donkokrom in the Brong East and Eastern Regions respectively. People in the fishing communities along the Sene River obtain clinic services at Bassa, Kwame Danso, and Kadjeji. There is also a hospital at Kete Krachi. Distances travelled to reach some of these facilities range from 8km to 100km on bicycle or tractor. The Donkokrom hospital is running a mobile clinic on the lake for communities up to the Digya arm. There is also a Government Lake Craft, named Onipa Nua, also carrying out a health delivery service for all communities living along the Volta Lake. The Atigagome settler community also has a functional (Community Health Planning services) CHIPS Compound.
- e. Environmental Sanitation** - Sanitation in all the communities is very poor. There are no decent toilet facilities in many of the communities, resulting in people going "free range". Where there are toilets, they are open, posing health risks to inhabitants of the communities Refuse is also dumped haphazardly, as there are no dedicated dumping sites.
- f. Educational Status and Facilities** - There is a high degree of illiteracy in the communities surrounding Digya National Park, as many parents are not enthusiastic about sending their children to school. Moreover, most of the communities in the Digya arm do not have any schools at all. This stems from the uncertainty about the possibility of being relocated on short notice. The few schools in some of the communities are

housed in temporary structures and have from two to six classrooms. There is not a single Junior Secondary School (JSS) in the Digya arm. Children of the communities along the Sene River attend JSS at Lesi, Bassa or Kwame Danso. For the farming communities, JSSs are situated in Anyinofi, Tiase, Kwasi Fanti and Donkorom. Students at the JSS level in areas without JSS are compelled to relocate to stay with either extended family relatives or friends of their parents, to access JSS education. The problem is exacerbated by the lack of qualified teachers at the JSS level.

- g. **Child labour:** The area, situated on the western banks of the Volta lake, is known for having large cohorts of very vulnerable children. There is a significant problem of child labor particularly around Lake Volta. This region is known for its high incidence of child trafficking and labor, with many children working in hazardous conditions in the fishing industry. Children as young as six have been found forced to work long hours, under abusive conditions, being subjected to physical abuse, starvation, and dangerous tasks such as diving to untangle fishing nets underwater. Many children found in such conditions are thought to be coming from other areas of the country and have been moved to relatives or friends in the hope of getting education or better living conditions.
  
- h. **Population** - According to the Statistical Services (1989), According to 2021 Ghana Population and Housing Census, the total human population of the five District that fringe Digya NP is 315,114. The Kwahu Afram Plains South has the largest population amongst the five fringe district. Sekyere Afram Plains District has the least population (32,640). The total number of households in the five Districts is 75,781, with an average household size of 4.18 individuals. Digya NP has more than 130 communities fringing it within 20km radius/buffer of the park. These fringe communities has a total of 179,500. There are more than 20 settler communities of varied sizes inside the reserve with human population of about 5000. Sekyere Afram Plains District has the least population density (9.5), followed by Sene East District (17.0) with Kwahu Afram Plains North the highest density (25.9). Detailed population data of the fringe district is indicated in the table below

Sn	District	Urban Population	Rural Population	Total Population	Number of Household	Ave. Household size	Population Density	Number of Communities within 20km buffer	Estimated population within 20km buffer Communities	Number of Communities Within 10km buffer	Estimated population within 10km buffer Communities
1	Sene West	17,900	51,936	69,836	16,541	4.2	23.4	27	41,902 (80%)	17	17,459 (25%)
2	Sene East	6,873	65,208	72,081	14,520	4.9	17.0	52	57,665 (60%)	36	43,249 (60%)
3	Sekyere Afram Plains	5,518	27,122	32,640	7,666	4.3	9.5	22	10,445 (40%)	13	4896 (15%)
4	Kwahu Afram Plains South	26,747	47,255	74,002	19,431	3.8	24.3	16	29,601 (40%)	7	14800 (20%)
5	Kwahu Afram Plains North	14,404	52,151	66,555	17,623	3.7	25.9	19	39,933 (60%)	10	19967 (30%)
	<b>Total</b>	<b>71,442</b>	<b>243,672</b>	<b>315,114</b>	<b>75,781</b>	<b>4.18</b>		<b>136</b>	<b>179,546</b>	<b>83</b>	<b>100,371 (32%)</b>

*Source: GSS 2021 Housing and population census*

- i. Ethnicity** - The Digya National Park is surrounded by a variety of indigenous ethnic groups. These include the Ashanti, Kwahu, Nchumbulu and Guan. Settlers of different ethnic origin occupy the rest of the area. Ewes dominate the fishing communities, from the Volta Region, Dangbe and Ningos from Greater Accra Region. The farming communities are also occupied by Krachis, Ewes from the Volta Region, Kokombas from the Northern Region, Frafras and Dagartis from the Upper East and Upper West Regions respectively. Except the Ewes who insist on speaking their native language, the medium of communication in most communities is Akan.
- j. Settlement patterns** - The settlement pattern of the communities in the study area is of the cluster type. That of the farming communities is a conglomerate of single-family unit houses made of wattle and daub and thatch roofing. People of northern origin generally put up round type of buildings whilst those from the south build rectangular houses. Houses in the fishing communities are more widely spaced to enable the people to do homestead gardening and keep livestock around their homes.
- k. Land Tenure** - Land is customarily owned in this part of the country where the Digya National Park is located. Here, land ownership is communal in nature, and organised around traditional areas/ stools, with a Paramount Chief at the top of the governance architecture in each traditional area. Paramount Chiefs are custodians of the allodial interest (i.e., the highest interest in land in Ghana), which they hold on behalf of themselves and members of the landowning group (i.e., the traditional area/ stool). Depending on its size, a traditional area may be sub-divided into several Divisional Areas. One divisional area may constitute several communities. Thus, in the hierarchy, divisional chiefs are directly below the level of a paramount chief and support the latter in the performance of his land and community governance duties. Divisional chiefs superintend over and community governance issues in their appointed divisional areas, and report same to the paramount chief. In turn, divisional chiefs can appoint a Community Chief/ “*Odikro*” to each community under their division. With such arrangements, authority is traced upwards the hierarchy. The leadership and type of land governance at the community level differ, depending on the status of the inhabitants – natives/indigenes or settlers. Settlers are mostly Ghanaians who have migrated from elsewhere in the country to live in the area. Community chiefs are appointed to native communities, whilst headmen are appointed to settler communities. It is important to clarify that this land ownership and governance arrangement applies to the fringe communities and communities beyond. It does not apply within the

boundaries of the Digya National Park which is a state property. Ownership and management rights of the park rests with the state, and exercised by the appropriate state agencies

In the fringe communities, indigenes, by virtue of the usufructuary interest they hold in the communal land, can use land anywhere provided the piece of land falls within the jurisdiction of their community/ chief and is not being already occupied and used by another person. Settlers on the other hand have to obtain approval from the chief or headmen for the land. They pay an initial introductory fee of one bottle of schnapp to announce their presence in the community. Later, an approach is then made to request farmland with two additional bottles of schnapps and some quantity of cola nuts. One of the bottles of schnapps is later sent to the paramount chief and the other is used to pray to the gods of the land. Per the Land Act 2020, Act 1036, and as with custom in the area, land is never sold. However, a settler seeking land for farming purposes would usually enter a tenancy arrangement with the community chief/ headman or a usufruct. According to DNP management currently, an allocation of land to settlers in such tenancy arrangements attracts a one-time administrative fee ranging from GH¢2,000 - GH¢5,000 depending on the paramount chief where the land is being given out. In addition to this, settler farmers on Kumawu Paramount Stool land are required to pay an annual "agreed ritual fee" to the chief for onward transmission to the paramount chief. A leasehold is another type of interest in land acquired for valuable consideration, and through which land can be acquired for various purposes in the area. Land leased to individuals or companies for large-scale farming is the sole prerogative of the ultimate (paramount chief). For individual farmers or settlers, they are referred to the sub-chief (*odikro*) who introduces the farmer or settler to the paramount chief. Aside voluntary donations, land for government projects within the fringe communities may also be acquired through leases which are usually negotiated with the paramount chief. (DNP management Plan, 1995).

1. **Land Use-** Subsistence agriculture is the predominant activity for the indigenous inhabitants. The settler farmers however, engage in commercial farming. The major crops cultivated in both situations are yam, cassava, maize, plantain and groundnuts. The land is very fertile and yields in the area are generally quite high. Some amount of cocoa and oil palm is cultivated in the forestlands. Virtually all farming is done in the rainy season between April and October of each year. During the dry season, the people are engaged in digging and transporting of yams to the big towns for sale, and then making yam mounds for the following year's planting.



#### 4.8 Traditional Administration

The Digya National Park falls under the Kumawu, Abetifi and Ajade Traditional Areas, all of which are under the stool land regime of customary land tenure. Similarly, each of the 70 fringe communities around the park falls under one of these three (3) traditional areas. One characteristic of stool land regime is that Chiefs have authority over both land and community governance matters. The farming communities fall under five paramount chiefs either Kumanwu, Abetifi stool lands, Nkoni, Kwaaman whilst the fishing communities come under Ajadi traditional area (DNP Management plan 1995) and this valid for today.

Functionally the chiefs/headmen at the respective levels perform executive, legislative and judicial functions and are directly responsible for the maintenance of customary law and order in the respective communities. The paramount chief exercises ultimate authority over the chief/headmen. The traditional administration provides a viable and dependable institution through which many development programmes are initiated and implemented.

#### 4.9 Political Administration

The Park and the fringing communities within the Digya landscape fall within the jurisdiction of five (5) administrative/political districts and key fringe communities are shown in the table below:

District	Key Fringe Communities
Sene West	Akyeremade, Akyeremade Battor, Dwankrom, Lassi, Kyeamekrom, Tato, menkor, Kofi Djan, Drobbe, Today
Sene East	Dadetoklo, Kwadjokrom, Kajaji, Basa, Deefour, Ntonaboma, Premuase
Sekyere Afram plains	Drobonso, Tuntum, Samsu, Anyinofi
Kwahu Afram plains North	Kwaekese, Adiembra, Amankwakrom, Agodekeh, Tonu, Donkorkrom
Kwahu Afram Plains South	Hwanyaso, Nsogyaso, Asanyaso, Samanhyia, Dedeso, Kwasi Fante, Tease, maame Krobo

Key Fringe Communities of Digya national Park

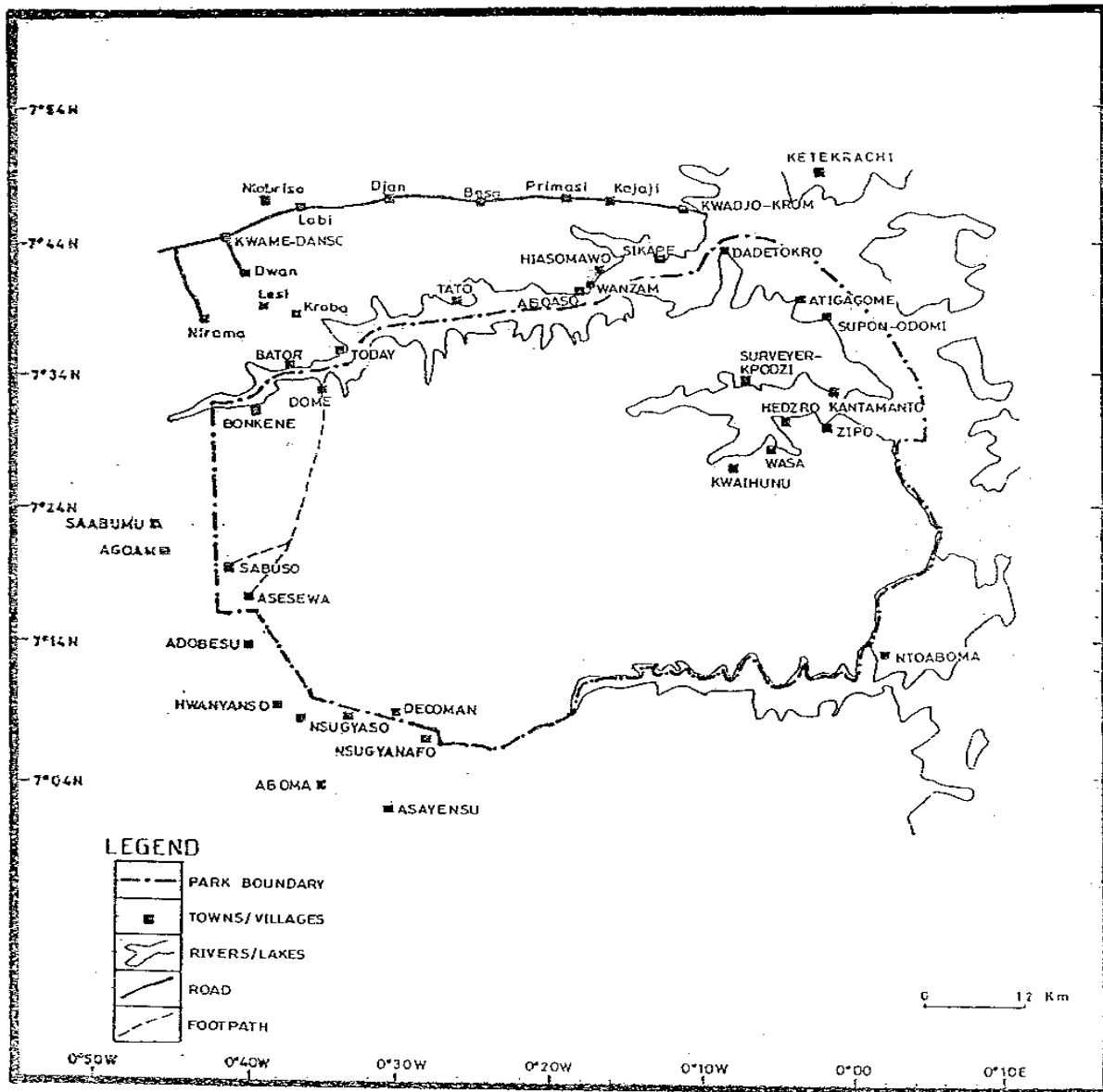


Figure 4-5 : Communities inside and fringes of DNP

## **4.10 LOCAL ECONOMY**

### **4.10.1 Crop Farming**

The settler farmers do most of the commercial crop farming. The type of crops grown is determined by whether the area is forest or savanna land. Forestlands are primarily used to cultivate cash crops like cocoa and oil palm. Plantain and cocoyam are also grown for sale.

Yam is the principal commercial crop grown in savanna lands. Maize, groundnuts and cassava are either cultivated separately or intercropped with yam. The cassava is generally dried into what is locally called "Konkonte" before it is sold. Rice is also grown where appropriate. Pepper, beans, garden eggs, tomatoes and agushie (neri) are usually cultivated by women on their husband's farms for their own benefit.

Within the fishing communities, people of Ewe origin attach a lot of importance to farming of cassava, and the surplus sold to other fisher folks who do not do any farming. Nungos, Efutus and Senyas live by bartering fish for food from those who farm.

### **4.10.2 Fishing**

Fishing is the major occupation of the communities that border the Sene, Digya arm and certain parts of the Volta Lake. These people from diverse ethnic origins have migrated to their present locations to take advantage of the inundation caused by the damming of the Volta. The fish is generally smoked and transported to the big towns for sale or sold to fishmongers who then transport them to the big towns.

### **4.10.3 Livestock Raising**

Livestock raising is done on a small scale by quite a number of people in the fishing communities along the Sene and in Old Nkomi. They keep mainly sheep and in the case of Old Nkomi, the chief of Wayo is keeping a large herd of cattle. In some communities, pigs are kept in addition to the sheep and goats. Livestock production provides supplementary source of income to farming and fishing. Livestock is not prevalent in the Digya arm where significant amount of farming is taking place. Few fowls are kept in many of the communities for home consumption and occasionally for sale.

### **4.10.4 Hunting**

Most of the hunting in the Digya National Park is done from the major farming communities during the hunting season, from where they go into the park to poach.

Many of the farming communities started as hunting camps. There are still some people within such communities recognised as hunters, even though it may now be secondary employment. These hunters generally set up hunting camps deep inside the park where they smoke their entire kill before bringing it out for sale to meat mongers, who transport it to the big towns.

#### **4.10.5 Other Activities**

Distillation of the local gin (Akpateshie) also forms part of the economy of some people, especially the indigenous people around the forest areas. They make use of palm wine from matured palm trees as the major raw material. Along the Digya arm, Akpateshie is also distilled from sugar cane grown along the shores of the river. Other economic activities include wild honey hunting, basketry and petty trading. Others operate drinking and "chop" bars.

## 5.0 CITIZEN/STAKEHOLDER ENGAGEMENT

### 5.1 Introduction

A stakeholder to the project refers to any individual or group potentially affected directly or indirectly by the proposed project or has an interest in or influence on the proposed Project. , the rationale for stakeholder engagement is that it is an essential part of good international practice and can help projects succeed. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, contribute to successful project design and implementation, and support project's risk management process.

Ghana's EA regulations provide for the consultation and participation of stakeholders in the Environmental Assessment process in order to ensure that their concerns and inputs are considered as part of the project design and planning.

There are enormous benefits that come with ensuring that there is an effective engagement with all stakeholders. Stakeholder engagement and participation is a process, not a single event. It provides an opportunity for all stakeholders to influence decisions that affect their lives.

The objectives of the stakeholder engagement are to;

- provide information about the project and its potential impacts to those interested in or affected by the project, and solicit their opinion in this regard;
- provide opportunities for stakeholders to make inputs into decisions on undertakings that may affect their lives
- bring local knowledge to bear on the project planning process
- provide the opportunity for stakeholders to raise issues and concerns at an earlier phase of the project planning in order to avoid conflicts during project implementation
- build a constructive relationship between proponent and stakeholders throughout the entire life cycle of the project
- facilitate the consideration of alternatives, mitigation measures and trade-offs and
- manage expectations and misconceptions regarding the project;

### 5.2 Stakeholder Consultation Approach

There are a number of approaches that can be used for effective engagement of stakeholders. The following tools and approach were adopted;

- Field visits and observations
- Community engagements

- Key Informant Interviews

The information obtained was then analysed and summarized to identify the baseline socio-economic conditions, to determine the potential project risks and impacts, to develop the mitigation measures and to enable monitoring and evaluation of the project implementation activities.

### **5.3 Identified Stakeholders**

The following stakeholders were identified and engaged on the preparation of the Environmental and Social Impact Assessment (ESIA):

- Beneficiary District Assemblies
- Beneficiary Communities
- Traditional Authorities
- Community Leaders/representatives
- Youth and other vulnerable groups (disabled and elderly)
- Management of Digya National Park

#### **5.3.1 Community leaders**

Community leaders in CREMA communities fringe communities and in admitted settlements i.e. Chiefs, opinion leaders, CREMA committee members and assembly members have been involved in engagement processes. Other vulnerable groups such as women and youth were consulted as they constitute the major beneficiary group of the project. These groups were given information on all aspects of the project intervention including the benefits, challenges and their obligations to ensure successful implementation. Methods used to achieve this included focus group discussions and public announcements using existing community channels of information dissemination.

The separate stakeholder engagement plan prepared for the project provided some good guidance to the stakeholder engagement during the field visits, engagement with community members and civil works site selection processes.

#### **5.3.2 Consultations with Municipal and District Assemblies**

Consultations were held with District/Municipal Assemblies in the Sekyere Afram Plains, Kwahu Afram Plains South and Sene West. The specific objectives for these consultations were:

- To provide detailed information about the project as a follow up to mails sent to introduce and explain the project objectives and components

- To participate in civil works site selection and solicit their views that could inform the project design
- To collect and find ways of collating data to enrich project design
- To identify other relevant stakeholders within the project area for further engagement

The district authorities provided the following documents and information:

- Current Medium-Term Development Plan
- District Maps
- Land Use Maps
- List of organizations working in the Municipality or District i.e. private companies, NGO's, CBO's, farmer associations etc.
- Cultural/historical sites present that can be develop for ecotourism

These documents were used to ascertain existing activities, evaluate sites selected and determine their suitability, to develop synergies, identify gaps, avoid duplication of activities, mainstream issues and to identify potential risks/impacts that could result from implementation of project activities. Tables 5-10 outlines the consultation process and key consultees and outcome of consultation respectively.

Table 5-10 : Outcome of consultations

No	Stakeholder/Facility	Issues/Concerns	Responses to Address Concerns
1	Mini Cassava processing plant at Lassi community	<ul style="list-style-type: none"> <li>• Community indicated that the processing facility will be very useful in the community and grateful such an intervention.</li> <li>• Issue of ownership of the facility</li> <li>• Siting of the facility so it can be easily assessed</li> <li>• Adding processing capabilities for cassava flour and dough, in addition to gari.</li> </ul>	<p>The facility will be for the community and that the project is facilitating such an intervention. Community leaders have assured the PCU their willingness to donate lands for this activity. The facility will be owned and managed by the community through the Water management Committee compose of representatives from all relevant units within the communities.</p>
	Dome Community (DNP)- Solar powered borehole and toilet facilities	<ul style="list-style-type: none"> <li>▪ This is a settler community within the DNP. The community is small and remote, which could make mobilizing materials and labour more difficult</li> <li>• The chief was grateful that the project will provide water and toilet facilities for them.</li> <li>• Issues of designing biodigester toilet facility</li> <li>• The women indicated they wanted a 2 units toilet facility (1 for the men and 1 for the women)</li> <li>• The land for these facilities was available</li> <li>• There was a request for the Solar panel for the borehole to be large enough to provide electricity at least to street</li> </ul>	<p>The design consultant will take all their concerns into consideration and come out with designs that are environmentally friendly as there are located within the park.</p>



		lamps to brighten the community.	
	Tato Community (DNP)- Game Viewing Platform	<ul style="list-style-type: none"> <li>• Initial site for the viewing platform was changed because its floods during the rainy season</li> <li>• How to get tourists to the site for bird viewing since the WD has only 1 boat which is not that comfortable for large tourist numbers</li> <li>• With increased tourists, there will be a need to properly manage human waste and trash. Lack of toilet facilities is already an issue. Proper sanitation facilities will be important.</li> <li>• The poor road conditions between the town and camp could worsen with more traffic. Upgrades to access may be needed to support tourism.</li> </ul>	<p>All concerns were taken into consideration during the designing of the platforms.</p> <p>Improving tourism will provide revenue for the district Assemblies, the project through the WD will work with the former to improve tourist infrastructure i.e. roads, sailing boats, provision of toilet facilities, upgrading of roads (with the introduction of District Road Improvement Project by Government) etc.</p>

## 6.0 IMPACT IDENTIFICATION AND PREDICTION

The report has identified, qualitatively assessed and classified potential environmental and social impacts and their respective management options. The proposed project is expected to have both positive and negative social, economic, and environmental impacts at different levels of significance. Potential impacts on the physical, biological and social environments have been identified and are assessed below. The identified potential environmental and social issues and impacts have been discussed based on the nature / features of the project, project area of influence, field inspections and observations, concerns from stakeholder consultations.

### 6.1 Impact Assessment Approach

To assess and quantify the identified impacts, factors considered to assess significance included:

- Relationship of the impact to temporal scales - the temporal scale defines the significance of the impact at various time scales, as an indication of the duration of the impact.
- Relationship of the impact to spatial scales - the spatial scale defines the physical extent of the impact.
- The severity of the impact - the severity/beneficial scale is used in order to scientifically evaluate how severe negative impacts would be, or how beneficial positive impacts would be on a particular affected system (for ecological impacts) or a particular affected party. The severity of impacts can be evaluated with and without mitigation in order to demonstrate how serious the impact is when nothing is done about it. The word ‘mitigation’ means not just ‘compensation’, but also the ideas of containment and remedy. For beneficial impacts, optimization means anything that can enhance the benefits. However, mitigation or optimization must be practical, technically feasible and economically viable.
- The likelihood of the impact occurring - the likelihood of impacts taking place as a result of project actions differs between potential impacts. There is no doubt that some impacts would occur (e.g. loss of vegetation), but other impacts are not as likely to occur (e.g. vehicle accident), and may or may not result from the proposed development. Although some impacts may have a severe effect, the likelihood of them occurring may affect their overall significance.

The assessment of impacts included direct, indirect as well as cumulative impacts as provided in the EPA’s guidelines for the preparation of Environmental Impact Statement as well as the World Bank’s ESS1. The impact and risk predicted / identified will have the following attributes

## 6.2 Community influence and vulnerable groups

The Digya National Park is the main area to be affected by the proposed project infrastructure and as well as some fringe communities (Lassi, Koranten, Deefour, Nsogyanfour, Agoam-aabusu) which are close to the sites proposed for construction of project facilities. These will be the main areas of impact such as noise, dust, biodiversity loss, etc. Vulnerable groups including women and girls within the fringe communities and even staff of the park may be vulnerable to gender-based violence, sexual harassment, teenage pregnancy from potential influx of migrant labour. Mitigation measures proposed will minimize these impacts during the construction phase.

Table 6-11 : Impact Types

Term	Definition
Beneficial / Positive	An impact that is considered to represent an improvement on the baseline or introduces a positive change.
Adverse / Negative	An impact that is considered to represent an adverse change from the baseline or introduces a new undesirable factor.
Direct	Impacts that arise directly from activities that form an integral part of the Project (e.g. new infrastructure).
Indirect	Impacts that arise indirectly from activities not explicitly forming part of the Project (e.g. noise changes due to changes in road traffic resulting from the operation of Project).
Secondary or induced	Secondary or induced impacts caused by a change in the Project environment (e.g. employment opportunities created by the supply chain requirements).
Cumulative	Impacts arising from the combination of multiple impacts from existing projects, the Project and / or future projects.
Transboundary	Impacts that extend to multiple countries, but are not global in nature (e.g. air pollution extending to neighboring countries and use or pollution of international waterways).
Global	Impacts that, when taken together with impacts created by other human activities, can become nationally, regionally or globally significant.

## 6.3 Criteria for Impact Evaluation

### Duration of the Impact

A temporary impact can last days, weeks or months, but must be associated to the notion of reversibility. A permanent impact is often irreversible. It is observed permanently or may last for a very long term.

### **Extent of the Impact**

The extent is regional if an impact on a component is felt over a vast territory or affects a large portion of its population. The extent is local if the impact is felt on a limited portion of the zone of study or by a small group of its population. The extent is site-specific if the impact is felt in a small and well defined space or by only some individuals.

### **Intensity of the Impact**

The intensity of an impact is qualified as strong when it is linked to very significant modifications of a component. An impact is considered of average intensity when it generates perceptible disturbance in the use of a component or of its characteristics, but not in a way to reduce them completely and irreversible. A weak intensity is associated with an impact generating only weak modifications to the component considered, without putting at risk its utilization or its characteristics.

### **Impacts Severity**

Major Impact: repercussions on the environment are very strong and cannot easily be reduced.

Moderate Impact: repercussions on the environment are substantial but can be reduced through specific measures.

Minor Impact: repercussions on the environment are significant but subdued and may or may not require the application of mitigation measures.

Following international best practice, significant impacts will be determined by consideration of the following:

- i. Sensitivity of the resource or receptor (rated as high, medium and low) by considering the importance of the receiving environment (international, national, regional, district and local), rarity of the receiving environment, benefits or services provided by the environmental resources and perception of the resource or receptor). For instance Schedule 5 (Regulation 30 (2) of Ghana's EA Regulations defines environmentally sensitive areas as 'all areas declared by law as national parks, watershed reserves, wildlife reserves and sanctuaries including sacred groves' which could be affected as a result of the development of civil works particularly in the Digya National Park; and
- ii. Severity of the impact, measured by the importance of the consequences of change (high, medium, low, negligible) by considering inter alia magnitude, duration, intensity, likelihood, frequency and reversibility of the change. The following criteria were used to determine the sensitivity of the receptor / resource and severity of the impact. It should be noted that the definitions given are for guidance only, and not all the definitions will apply to all of the environmental/social receptors and resources being assessed.

Therefore, the assessment will be further justified within each topic, referring to those tables where definitions are applicable.

Table 6-12 : Determination of Receptor Sensitivity

	<b>High</b>	<b>Medium</b>	<b>Low</b>
<b>Guideline definitions</b>	Receptor is rare, legally protected, of international or national designation. Population rely on resource for health, subsistence or livelihood, or receptor is of high cultural value. Human receptors – vulnerable groups, Project Affected People (PAPs).	Receptor is of regional importance. Resource may benefit the local population, but they do not rely on it for health, subsistence or livelihood. Receptor is of some cultural value.	Receptor is common, or of local importance. Resource is not used or is of no value to the population.

#### 6.4 Magnitude of the Impact

The assessment of magnitude has been undertaken in two steps. Firstly, the key issues associated with the Project are categorised as beneficial or adverse. Secondly, impacts have been categorised as major, moderate, minor or negligible based on consideration of the parameters such as:

- Duration of the impact - ranging from temporary with no detectable impact to impacts still present beyond decommissioning
- Spatial extent of the impact – for instance, within the site, boundary to regional, and national.
- Reversibility - ranging from permanent requiring significant intervention to return to baseline to no change
- Likelihood – ranging from occurring regularly under typical conditions to unlikely to occur
- Compliance with legal standards and established professional criteria - ranging from substantially exceeds national standards and limits / international guidance to meets or exceeds minimum standards or international guidance. Table 6-3 illustrates generic criteria for determining magnitude.

Table 6-13 : Criteria for Determining Magnitude

Magnitude (Beneficial or Adverse)	Description
Major	Fundamental change to the specific conditions assessed resulting in long term or permanent change, typically widespread in nature, and requiring significant intervention to return to baseline; exceeds national standards and limits.
Moderate	Detectable change to the specific conditions assessed resulting in non-fundamental temporary or permanent change
Minor	Detectable but minor change to the specific condition assessed
Negligible	No perceptible change to the specific condition assessed

## 6.5 Positive Impacts

The proposed civil works in and around the Digya National Park is expected to generate potential positive impacts. The water systems in the park will improve the population of the wildlife through the provision of watering points at the peak of the dry season. The viewing platforms will help boost the tourism capacity of the park and will also promote the sustainable management of natural resources while the cassava processing facilities will enhance the livelihoods of local communities depending on these natural resources. Other positive impacts include:

### 6.5.1 Employment Generation

The construction phase will generate direct employment opportunities, the majority being unskilled work. These workers will be hired by the construction contractor, which will mobilize the adequate workforce. Most of this workforce will likely be recruited locally, with a smaller percentage of specialized workers likely to be mobilized from abroad. The jobs created by the Project, both directly and indirectly, will lead to an increase in family income of the workers hired locally, and the improvement of the wellbeing of their families. Note, however, that these are temporary jobs related to works duration.

### 6.5.2 Economic Impacts

The constructed water systems particularly in the fringe communities will provide enough water for the watering of animals during the dry season to improve the health of domestic animals which are source of income during the dry season. The provision of processing facilities will enhance the local livelihoods. This will further curtail the practice of rural-urban migration by the youth in search of jobs.

## 6.6 Potential Negative Environmental and Social Impacts

The construction of the water systems (water holes, dugouts and boreholes), game viewing platforms, toilet facilities and mini cassava processing facilities in and around the Digya National Park will be associated with some potential impacts considering the locations of the projects. The projects are in a sensitive area (protected area-Digya National Park) in accordance with the Environmental Assessment Regulations. Both the water systems and viewing platforms to be constructed in the park which is close to existing streams and rivers which have diverse and rich biodiversity. It is therefore important to ensure that any development that goes on within or close to them does not negatively affect their quality.

### 6.6.1 Construction Phase Impacts

The perceived environmental consequences during the construction phase will include:

- ✓ Loss of Habitat and Biodiversity
- ✓ Air quality impacts
- ✓ Noise and vibration impacts
- ✓ Water quality deterioration
- ✓ Visual Intrusion
- ✓ Erosion and Siltation
- ✓ Potential fire hazard
- ✓ Conflict between construction activities and livestock watering
- ✓
- ✓ Disposal of construction debris
- ✓ Impacts on occupational health and safety and community safety
- ✓ Transmission of infectious diseases, including HIV/AIDS
- ✓ Community health and safety e.g. traffic accidents
- ✓ Gender Based Violence and Child Abuse (child labour, forced labour)
- ✓

#### 6.6.1.1 *Loss of Habitat and Biodiversity*

Site preparation for the construction of the water systems, game viewing platforms, toilets and mini cassava processing facilities would involve the clearing of vegetation and to pave the way for the excavation of the reservoirs. The vegetation clearing may lead to the destruction of rear and endangered flora and the destruction of important habitats for some fauna. Though the construction will be in the national park and its fringes, fringes due to the mitigation measures prescribed it is anticipated that impact on, flora and fauna will be negligible.

### **6.6.1.2                      *Impacts on Air Quality***

Ground preparation, excavation of the dugouts and water holes and the movement of heavy-duty trucks to and from the site will lead to the loosening of the soil, emissions from the combustion of fuel and the re-entrainment of particulate material. Airborne pollution, in particular, dust resulting from clearing and excavation of the land may pose health risk to construction workers and any near-by residents in the vicinity. Though the construction activity will generate some amount of dust, the impacts will be limited to only the construction phase of the project and therefore short term and the impact is considered minor.

### **6.6.1.3                      *Noise and Vibration Impacts***

During construction, noise and vibration nuisance are likely to emanate from the construction machinery, loading of construction spoils, tipping of raw materials, and movement of construction vehicles at the site. The generated noise and increase dust levels could further disturb the serene nature of the area. Noise to be generated during the construction stage will be intermittent and limited only to the construction phase. The impact is considered minor. The EPA permissible noise levels for residential areas is 50-60 dB, however, the construction sites are not close to the communities and therefore will not cause nuisance to these communities. Workers will be provided with appropriate PPEs when noise become excessive.

### **6.6.1.4                      *Water Quality Deterioration and Supply Impacts***

Some of the sites for water systems that will be constructed may be within channels of streams that may serve as source of domestic water for downstream users i.e. the main rivers like, Digya and Obosom. The likelihood of the water quality deterioration from constructional activities will be high. If the downstream users continue to use the water, it may have serious implications on their health and that of their livestock. In addition, if the flow of the water is blocked, it will deprive downstream users the use of the water. The impact is evaluated as major..

### **6.6.1.5                      *Visual Intrusion and Aesthetics***

The construction activities will result in temporal stockpile of soil because they will be used for the establishment of the embankments for the dugouts and those of the waterholes in DNP will be conveyed to an accepted location agreed upon by the Sene west district assembly and the



management of the park, This impact will only be limited to the construction phase and sites and therefore rated as negligible.

#### **6.6.1.6                      *Soil Erosion and Changes in Drainage Pattern***

Removal of vegetation and subsequent excavation activities required for water systems and the viewing platforms may impact the existing drainage pattern in the area if they are located near streams or rivers. Final selection of sites indicates that none of the water systems are located close to streams or rivers. The risks of soil erosion and changes in drainage patterns would not be a major risk, The sides of the embankments will also be vegetated with vertiva grass to curb erosion and reduce sedimentation of the dugout The impact for this anticipated risk will be negligible.

#### **6.6.1.7                      *Potential Fire Hazards and Risks***

The proposed sites selected for the construction of the water systems, viewing platforms are located in the northern part of Ghana with Savana vegetation. This type of vegetation dries up during the dry season and prone to fire outbreak. The use of sources of fire such as matches and lighters and smoking of cigarette especially in the park by construction workers may cause fire outbreak and therefore affect the integrity of the flora and fauna. The storage of flammable materials and petroleum products such as petrol, diesel and engine oil may trigger fire outbreak. However, this impact is rated as negligible the activity itself will not pose any serious risks.

#### **6.6.1.8                      *Disposal of Construction Spoils***

The construction spoils and debris generated at the site will have to be disposed of at an approved site to avoid environmental problems. The loading of the construction spoil into trucks and the movement of these trucks to and from may pose safety risks to both the construction workers and the communities along the haulage route. If the site for the disposal of the construction spoil is not carefully chosen, it may generate additional environmental challenges especially if the site is environmentally sensitive. The impact is rated moderate.

#### **6.6.1.9                      *Liquid and Solid Waste Disposal***

Inadequate provision of portable restrooms/mobile toilets and garbage receptacles at the construction site could lead to unsanitary conditions. Resulting impacts could vary from unsightly littering of the site, fly and vermin infestations. It is essential to ensure that there is no direct defecation and discharge of untreated effluent into the nearby environment. The impact rating is negligible.

#### **6.6.1.10 Occupational Health and Safety Risks**

Particulate matter and noise to be generated during construction phase could affect the health of workers if not managed well. Dust emissions, noise nuisance, vibration and other risk factors in the work environment can pose serious occupational health and safety problems. The combined exposure of dust and noise could increase the risk of hypertension among workers, asthma, bronchitis, heart and lung disorders, sleep disorders, hearing loss etc.

Another area of safety concern is the possibility of workers falling into the reservoir when it starts filling with water while construction is still on-going. The use of heavy equipment such as excavators can also pose serious safety risks. Overall, the impact of these factors is rated moderate.

#### **6.6.1.11 Community Health and Safety Risks**

During the construction phase especially of water systems for the fringe communities there will be issues of dust, traffic, and community health and safety concerns. The earth materials excavated from dugouts near fringe communities will be used to create the embankments so there will no haulage of materials. The truck movement will only be the transporting of equipment. Dust may only be generated during excavation at the construction sites which are not close to the communities.

#### **6.6.1.12 Gender based violence including sexual harassment, child abuse and child labour exploitation**

The contractor will at all times use local labour if they are available. The Works Contractor could engage children minors (child labour) for the construction works if proper checks and monitoring is not enforced. It will be necessary to ensure age verification of all workers, since it is sometimes difficult to define a person's age, simply from the physical appearance. There is a possibility that construction workers may engage in acts of sexual exploitation and other forms of exploitation of workers if proper checks and monitoring are not enforced. Female workers/ female community members are at risk of gender-based violence including sexual harassment and exploitation from their male counterparts. According to the Domestic violence in Ghana document, 2016 its incidence among women decreased from 17.2 percent in 2008 to 10.3 percent in 2015 and that of men from 12.7 to 11.2 percent during the same period and this was higher in urban areas than rural. The inference is that the assessment area being rural has limited rate of gender-based violence. This impact is rated moderate.

### **6.6.1.13 Transmission of infectious diseases including HIV/AIDS**

During the construction phase, workers are likely to move from their permanent place of residence to the communities. There is the possibility of sexual promiscuity and if the partners are unprotected there is the likelihood of transfer of sexuality transmitted diseases from one partner to the other, especially HIV/AIDS. The estimated district adult HIV prevalent rate for four out of five districts which falls under the DNP are Sene West 0.67, Sene East 2.51, Afram Plains South 1.14 and Sekyere Afram plains 0.72. (Ghana HIV Facts Sheet, 2020).

## **6.6.2 OPERATIONAL PHASE IMPACTS**

Operational phase impacts have been identified to include the following;

- ✓ Water quality deterioration
- ✓ Potential drowning hazard
- ✓ Employment generation
- ✓ Socio-economic impacts
- ✓ Conflicts
- ✓ Solid and liquid waste impacts
- ✓ Occupational Health and Safety
- ✓ Potential flooding and diseases

### **6.6.2.1 Water Quality Deterioration**

The water systems for the fringe communities are meant to water livestock in the beneficiary communities, however, due to scarcity of water resources, it may be used for other domestic purposes such as cooking and drinking. Animals which drink from the dugout are likely to defecate and urinate into the water which can lead to the deterioration of the quality of the water and render it unwholesome for other uses. The stagnant water may also serve as a breeding grounds for disease vectors which will have implications for the health of the people. This impact is rated major.

### **6.6.2.2 Potential Drowning Hazard/Fall from Platform**

During the operational phase of the water systems in the fringe communities, the dugouts will be full of water to a depth of about four meters. This will pose a serious risk of drowning to users, both human and animals if measures are not put in place to prevent such incidents. The operation of the viewing platforms may lead to accidental fall of tourists if adequate safety measures are not instituted. The impact is rated major.

### **6.6.2.3 *Inter community Conflicts***

The Digya National Park in Ghana has been the scene of conflicts between local communities and wildlife managers ever since its establishment in 1971. The conflicts range from apprehension of local people by Wildlife Officials for entry into the park to collect non-timber forest products, to serious confrontation with poachers, arrests and evictions that occasionally result in deaths. The provision of processing facilities for the fringe communities can lead to other dimensions of conflict during the operational phase. Issues of access (how and when) to the facility by community members may arise. The facility is also provided for the larger CREMA communities, though will be sited in just three (3) areas, which can also create some form of conflict at the operational stage. This impact is rated negligible. .

### **6.6.2.3 *Solid and liquid waste***

The mini-processing facilities is expected to generate some amount of solid and liquid waste (effluent). The main source of solid waste will be cassava peeling from the mini processing plant. Improper accumulation and disposal of wastes can make the site aesthetically unpleasant, produce foul smell, and create conditions for breeding of disease-causing insects like houseflies. This poses a threat both to the health of workers onsite and the public as disease outbreaks. Pressing of grated cassava will also generate some liquid waste as well as that from toilets have to be managed.

### **6.6.2.4 *Potential Flooding and Diseases***

The construction activities may lead to impoundments and stagnation of water, the physical locations of these water systems are at the low lying areas of the communities and water catchment areas. In the event of high and prolonged rainfall events, the possibility of the dugouts overflowing their banks is very low considering experiences on dugouts constructed during the erstwhile Sustainable Land and Water Management Project. However, variations in rainfall patterns due to climate change make the risk of flooding unpredictable and when it happens it may also be accompanied by disease-causing contaminants which may affect the community members. This impact is rated moderate.

### **6.6.2.5 *Occupational Health and Safety risks***

Operation and maintenance of the cassava processing facility can put workers at high risk of accidents and incidents. Workers may also be exposed to exhaust fumes, fire hazard and noise. Noise operation is mainly expected to arise from machinery and equipment such as grinder and grater. This impact is site specific and rated moderate.

#### ***6.7.2.6 Analysis of Cumulative Impacts?***

Regarding the analysis of cumulative impacts, it is anticipated that the impacts of individual interventions may be negligible, the cumulative effects of the past, present and reasonably foreseeable actions on biological resources and communities can be considerable. No significant cumulative impacts are expected on archaeology and cultural heritage, land use, air and water quality, noise, geology and soils. Overall, the cumulative impacts of the proposed civil works in the study area would be manageable with diligent adherence to World Bank standards and national requirements. Communities and resource agencies affected by these interventions have been substantially involved in the project planning and design of processes of these facilities to be constructed. The fruitful engagement the PCU, consultants and contractor had with them which the project will continue regularly will ensure that communities are not adversely affected or otherwise minor impacts can easily be mitigated.

## 7.0 IMPACT MITIGATION AND ENHANCEMENT MEASURES

Mitigation measures are meant to ensure that project impacts are prevented from happening or minimized to a large extent. It is always appropriate to apply the mitigation hierarchy of avoidance, minimization and offsetting. Proper site selection and engineering and design may help avoid certain impacts. Where avoidance is not possible design can further minimize the impacts of the proposal so that their intensity can be reduced or mitigated. After mitigation measures are put in place proper monitoring regime can help evaluate the effectiveness of the measure put in place and where they are not effective corrective measures are implemented in order to ensure success.

In situations where the impacts are positive, further measures are put in place to optimize the beneficial effects

### 7.1 Type of Mitigation Measures

The mitigation measures proposed for consideration have been classified into three main groups, namely based on the mitigation hierarchy:

- Preventive measures;
- Control measures; and
- Compensatory measures.

#### 7.1.1 Preventive Measures

At the design and pre-construction phase, preventive measures are developed and adopted. The avoidance or minimisation of potential major impacts at source are the aims of preventive measures. Avoiding or reducing an impact at source is essentially ‘designing’ the project so that a feature causing an impact is designed out (e.g., site selection to avoid sensitive areas) or altered (e.g., working at night where necessary) or avoided (e.g., community sensitisation programmes to avoid conflicts or confrontations). Regarding child labour, prevention measures would primarily include sensitization on the problem in the community, workforce and contractors, age verification of workers, and the planning of works activities in such a way it does not affect negatively the use of children’s time in the households. For example, if parents or adult household members are undertaking remunerated work for the project, this should not negatively affect children’s school attendance. This could happen if the works activities are not adapted to also take into account the time adult household members need to manage the household and undertake domestic chores.

#### 7.1.2 Control Measures

The measures adopted to abate or remedy the impacts occurring during construction and operation / maintenance phases are the control measures. The abatement of impacts could be done on site or

at the impact location. In instances where there is unavoidable damage to a resource, repair or remedy of impacts may be applied, e.g., re-vegetation of the affected areas where vegetation is cleared during land preparation. In this case repair essentially involves re-vegetation of the affected parts. Regarding child labour, contractors and workforce would be trained on age verification of workers, what child labour is, overall, in order to be able to identify cases, and know what to do if a case has been identified.

### **7.1.3 Compensatory Measures**

Where other mitigation measures are not possible or fully effective, compensation, when required, will be provided in accordance with the local standards as set forth by the relevant entities.

## **7.2 Mitigation Measures for Significant Potential Negative impacts**

The assessment revealed some significant potential project impacts for which mitigation measures will be required to ensure environmental soundness, social acceptability and project sustainability of both the construction and operation phases. While some of the measures will be in-built into project design, others will be implemented during project execution. The mitigation measures outlined to address their respective constructive phase impacts are:

- Habitat and Biodiversity protection measures;
- Air quality control measures;
- Noise reduction and vibration control measures;
- Water contamination prevention measures;
- Visual Intrusion management measures;
- Erosion and Siltation control;
- Fire hazard control and safety;
- Conflict prevention measures
- Land acquisition and compensation management measures
- Construction debris management;
- Occupational health and safety measures;
- HIV/AIDS prevention and management;
- Community health and safety measures; and
- Gender Based Violence, Child Abuse and Child Labour prevention measures.

## **7.3 Mitigation of Construction Phase Impacts**

### **7.3.1 Habitat and Biodiversity Protection measures**

During the construction period, clearing of the land will be limited to only the designated place and trees that can remain will not be felled. Where reforestation is required the project will task the Forest Services and Wildlife divisions to undertake this activity in consultation with management of DNP and community leaders in fringe communities. Workers will not be allowed to capture any form of wildlife in spite of the regular patrol of park guards, they will also be educated on biodiversity protection. Selection of final sites with the assistance of park management will be done to not jeopardize any critical habitat if any.

### **7.3.2 Air quality control measures**

Construction machinery will be serviced regularly according to manufacturer's specifications to avoid/minimise the release of particulate matter into the air. It is expected that where the water systems will be built will be wet and therefore the soil will not be loosened to the extent of releasing suspended particulate matter. However, in areas where the soil is dry, water dowsing will be frequent especially during the dry season to avoid/minimise dust pollution as a result of wind action. Minimum amount of particulate matter is expected to be released from the construction of the viewing platforms, toilet and processing facilities will have minimum particulate matter emissions.

### **7.3.3 Noise reduction and vibration control measures**

Drivers of trucks and operators of construction machinery and equipment will be sensitised and required through regular safety meetings to use their horns only as a last resort in order to keep down noise levels at the project site. Construction equipment and machinery will be serviced regularly in order to keep their noise levels low.

### **7.3.4 Water contamination prevention measures**

Where the dugouts/waterholes will be constructed within the channels of streams and rivers, there will be temporary diversion so that the construction activities do not muddy the water and render it unwholesome for downstream users. The construction of the other infrastructures will not cause disturbance to the water resources within the park and its fringes.



### **7.3.5 Visual Intrusion management measures**

During construction the project site will be fenced off and prevented from direct public view. This will also prevent unauthorized persons from accessing the site while construction is ongoing. The fencing will also prevent stray animals/wildlife from getting to the site which could be injurious.

### **7.3.6 Erosion and Siltation control**

Exposed soil surfaces will be compacted as much as possible to reduce erosion and siltation into water bodies. Sediment traps will be installed during construction to intercept solids from the site to prevent transport into near drainage systems. However, it is anticipated that construction of the water holes, dugouts and boreholes will take place during the dry season in order to avoid sediment-laden runoff and erosion incidences. Also exposed land surfaces will be landscaped and vegetated immediately to minimize sediment movement.

### **7.3.7 Fire hazard control and safety**

Using naked fire or any ignition source that has the potential to spark or start fire on the construction sites will be prohibited and regarded as an offence. Petroleum products to fuel construction machinery will be kept in a bunded and safe place to avoid leakages and possible fire explosion. Wildfires are controlled by creating fire belts as a preventive measure and controlled burning is intentionally done by park management to also prevent wildfires. Other emergencies are also the responsibility of park management to ensure that appropriate authorities are involved to address the issue depending on which part of the park such an emergency situation occurs. In addition, first aid facilities are made available for victims immediately the situation occurs.

### **7.3.8 Construction Waste Management Measures**

The main construction waste and debris will be the cleared vegetation, the excavated soil, construction rubble, paint containers and campsites waste which will require disposal. The cleared vegetation which will be mostly organic can be deposited near the construction site, while the excavated soil will be disposed of at an approved site where it will not generate further environmental problems. The disposal of the soil will be discussed with the relevant community leadership and the relevant District Assembly (Sene West) so that there will be common understanding in order to reduce conflicts. Plastic used by workers will also be collected in dustbins and disposed of at the appropriate dumpsite. Littering of plastics by workers will also be prohibited to protect the pristine conditions of the site.

During construction workers will be entitled to sanitary facilities such as mobile toilets and urinals. The job specification given to the contractor will ensure that provision is made for sanitary facilities for construction workers at the site to avoid unhygienic conditions.

### **7.3.9 Occupational Health and Safety measures**

The contractor will ensure that adequate and appropriate Personal Protective Equipment (PPE) and other facilities are provided in accordance with the Factories, Offices and Shops Act, 1970 (Act 328) and the relevant Environmental and Social Standards of the World Bank. Operators of noisy equipment and machinery will be provided with earmuffs, whilst others who will be working in the trenches and on the walls of the water systems will be provided with harnesses if required. The contractor will enforce the use of PPEs and will have powers to sanction or reward workers of good behaviour.

Traffic notices will be posted in the communities where haulage trucks will be passing to warn them of the potential dangers associated with the movement of the trucks. Speed limits will be imposed on all vehicles that will commute on the access road. The control of traffic to and from the site will help to avoid instances of vehicular-pedestrian conflicts. The contractor will hold weekly safety meetings with workers.

### **7.3.10 HIV/AIDS prevention and management**

Construction workers as well as the communities will be taken through an awareness and education programme on STDs, especially HIV/AIDS and the need to abstain or protect themselves. Preventive materials such as condoms will also be made available at vantage points such as the washrooms.

### **7.3.11 Gender Based Violence, Child Abuse and Child Labour prevention measures**

Efforts should be made to prevent project related GBV issues during construction and operation of infrastructure. Some measures to be instituted include

- Require all contractors to have a Code of Conduct for project workers that: prohibits gender-based violence (including sexual exploitation and abuse and sexual harassment (SEA/SH) as well as child and forced labour; prohibits sexual contact with persons under 18; and contains clear sanctions in the event of breach.
- Require all contractors to regularly train employees on the GBV/SEA/SH Codes of Conduct and how to report incidents;
- Require all contractors to document other SEA/SH risk mitigation measures (including incident response procedures) in their ESMPs or other safeguards instruments

- Ensure the implementation of the project’s Grievance Mechanism which has special procedures for confidentially responding to GBV/SEA/SH complaints with a survivor-centred approach; and put in place a referral pathway to GBV service providers linked to the Grievance Mechanism;
- Develop an incident response protocol to guide the Wildlife Division’s response to GBV/SEA/SH incidents (Accountability and Response Framework)
- Sensitize communities on GBV/SEA/SH risks as well as reporting mechanisms and expectations;
- Post contact numbers of representative on the Grievance Redress Committee and GBV Service Providers around the construction site
- Indicate a minimum requirement of female employment in the human resource policy of the facility manager/operator.

### **7.3.12 Child protection and Child Labour**

In order to prevent child labor, the community, workforce and contractors will be sensitized on what child labour is, and why it is harmful to children, age verification of workers will be undertaken. During the construction, contractors should only engage the right category of persons meeting the requisite minimum age requirement under the Ghana Children Act 1998 and the provisions made in the related World Bank ESS 2. Photo Identification with DOB (voter ID, NHIS card, SSNIT) should be provided prior to engagement of persons as proof of their legal age and all contractors will be required to have a Child Labour Policy in place and ensure their implementation. Child labour will also be prevented through planning works activities in such a way it does not affect negatively the use of children’s time in the households. For example, if parents or adult household members are undertaking remunerated work for the project, and if the works activities are not adapted to also take into account the time that adult household members need to manage the household and undertake domestic chores, this should not negatively affect children’s school attendance and opportunity to benefit from education. Thus, the work activities and engagement of adult workers for the project need to be carefully planned. Community members, contractors and workforce would also be trained on what child labour is, in order to be able to identify cases, and would be told what to do if a case has been identified.

### **7.3.13 Mitigation measures for Potential Oil contamination of Soil**

In order to prevent the potential for oil leakages from construction machinery, the contractor will adhere to strict maintenance and servicing regime so that any leaking part of the machines will be detected as early as possible and maintained to prevent soil contamination by oil leakages.

## 7.4 Mitigation of Operational Phase Measures

The mitigation measures outlined to address the operational phase impacts include the following;

- ✓ Water quality deterioration prevention measures
- ✓ Potential drowning hazard prevention measures
- ✓ Conflicts prevention and management measures
- ✓ Potential flooding and diseases
- ✓ Effluent discharge from toilets and processing facilities
- ✓ Solid Waste
- ✓ Occupational Health and Safety
- ✓ Noise

### 7.4.1 Water Quality Deterioration

The dugout are being developed to serve the needs of the beneficiary communities mainly for livestock watering. In order to prevent deterioration of the water quality, the design will include water trough where little quantities may be collected where the animals will drink from instead of entering the reservoir. Notices such as ‘do not defecate’ will be posted around the dugout as a form of education and caution to community members to maintain the quality of water that will be collected in the dugout. Grasses will also be planted around the dugouts to reduce soil erosion and siltation of the dugouts.

### 7.4.2 Potential Drowning Hazard/Fall from Viewing Platform prevention measures

The depth of the water at the deepest part may range from 2.5 to 4 meters. The potential risk for users’ drowning will be high. The design permits a slope of 20 % that permits animals and humans to fetch water from predetermined entrance to prevent drowning.

Additional strategies to prevent drowning of humans may include the following:

- Warning notice will be posted to indicate ‘no swimming’, ‘danger of drowning’, etc.
- There will be extensive education in the communities on the use of the water including how to prevent the risk of drowning.

There can be accidental fall of tourist from the viewing platforms. Forest/Tourist will be available to orient tourist on the precautionary measures to take when viewing game from the platform. The design of the platform will have some ‘benches’ where tourist can sit and view the game.

### **7.4.3 Conflicts prevention and management measures**

Conflicts may arise when there is disagreement between or among parties. The water systems and processing facilities will not be provided in every fringe community and therefore those who will not be direct beneficiaries may also want to send their livestock to drink from the dugout especially during the dry season when there is scarcity of water as well as send their agricultural products for processing. This has the potential for conflicts between any two communities within the project area. Conflicts will be resolved through the following means;

- A Water Management Committee (WMC) /Facility Management Committee will be put in place in all the beneficiary communities where there are no existing ones to oversee the use and management of the water. The committee will comprise representative from the traditional authority, cattle owners, women, youth, assemblyman/woman, farmers etc.
- The Community Resource Management Committee (CRMCs) will be put in place in beneficiary communities where there are no existing ones to oversee the use and management of the processing facilities. The committee will comprise representatives of all units within the community i.e. traditional authority, women representative, assemblyman/woman, leader of Fulani herdsmen, farmers association, unit committee members, youth groups, fisher folk etc.
- A grievance redress mechanism will be put in place as part of the management of the dugout and processing facilities. This will spell out the processes for reporting and resolving the conflicts.
- Water sharing and use of processing facilities mechanisms among the communities will be developed to allow for the use of the water and processing facilities by other communities.

### **7.4.4 Fire Management**

The operational phase of the water systems especially those in the fringe communities will not have a direct linkage with fire hazards but the potential for water users to set fire into the vegetation around will be very high. The major tool for managing fire will be education and awareness creation. The community members will be educated on the hazards of fire and the need to prevent it from happening and more importantly maintain the vegetation around the dugout. The processing facilities to be constructed will comply with the provisions of the Fire precaution (premises) regulations, 2003 (LI 1724) by ensuring that appropriate fire extinguishers and other q as recommended by the Ghana National Fire Service (GNFS) are in place. Experts from the GNFS will also be engaged to train caretakers of these facilities.

### **7.4.5 Potential Flooding and Diseases prevention and management measures**

Flood control measures such as weir and appropriate buffers will be provided so that in the event of flooding it will not affect any of the communities. The dugouts are also sited far away from

communities in order to reduce the risk of flooding. In addition district Engineers of the various Assemblies the locations of the dugout and the Ghana Hydrological Authority will be involved in the review of design sessions to be organised by the Consulting firm.

#### **7.4.6 Effluent Discharge from Toilets and Processing facilities**

Sewerage generated from the toilets to be constructed will be channelled to bio-fill or digester as the main treatment method. Where this is not feasible septic tanks will be installed as primary treatment and disposed at the approved District Assembly disposal facility when full. During the operations of the processing facilities wastewater generated from cassava processing activities would be held in ponds of different chambers for primary treatment. Treated effluent will be discharged in accordance with Ghana Standard for Environmental Protection-Requirements for Effluent discharges (GS 1212:2019) for the applicable sector.

#### **7.4.7 Solid Waste Management**

Management of solid waste such as plastics, cassava peels, etc. generated during the operational phase of the processing facilities shall be done in accordance with the waste management hierarchy. As waste cannot be completely avoided, reuse measures will be exploited. For instance cassava peels will be dried and used for other purposes such as feeds for livestock and other medicinal purposes. Other waste such as plastics will also be segregated into color-coded bins and given out to EPA licenced companies for recycling. Plastic wastes will be reused or appropriately recycled. Where the waste is to be disposed it shall comply with the District Assembly's bye-laws on waste management and sanitation

#### **7.4.8 Occupational Health and Safety**

The FMCs and the CRMCs would be empowered to implement a Health & Safety Policy to guide the day-to-day operations at the facility. The operators of the processing facility will be trained on occupational health and safety measures to guide them in operating the machines in the processing facilities. Appropriate personal protective clothing/gears will be provided to workers and measures will be in place to enforce usage. Within the facilities, a well- stocked first aid kit will be provided to cater for minor injuries that may occur.

#### **7.4.9 Noise**

All machinery should be maintained in good working condition through regular servicing in accordance with manufacture's specification to reduce noise and vibration. The equipment, particularly grater and grinder which would be intermittently used, should be shut off in periods of non-use. Ghana Regional Appropriate Technology Industrial Service (GRATIS) the manufacturer of project processing facilities will be responsible for routine and regular servicing

of these equipment in compliance with the Ghana Standards for Health Protection - Requirements for Ambient Noise Control (GS 1222, 2018).

#### **7.4.10 Cultural Heritage**

The World Bank Environmental and Social Standard 8 recognizes the importance of cultural heritage for current and future generations and the need to preserve and protect cultural heritage from the adverse impacts of sub-project activities. It therefore requires the assessment of the project impact on cultural heritage of the people. The consultation therefore tried to solicit information on any cultural heritage within the project area of influence that may be affected by the project. There was no indication that there exists any cultural heritage that may be physically affected by the sub-projects. What could not be identified is cultural heritage that might have been buried underground and are previously unknown. Such cultural heritage that may be found by chance during implementation of sub-project activities will be managed using the chance finds procedure described in section 8.9.7.

## **8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN**

This Environmental and Social Management Plan (ESMP) has been developed for the proposed civil works in and around the Digya National Park in compliance with the requirements of the Ghana Environmental Assessment Regulations of 1999, (LI 1652), and the relevant World Bank environmental and social standards to guide project implementation in an environmentally and socially sound and sustainable manner.

### **8.1 Objectives of the ESMP**

The following are the objectives for the implementation of the ESMP:

- 
- Manage impacts during the implementation phase of the project.
- Ensure satisfactory environmental and social performance.
- Provide a platform to accommodate changes and uncertainties during project implementation.

### **8.2 Environmental and Social Risk Management Team**

In order to maintain control over the implementation of the project and also ensure that commitments made in the Environmental and Social Impact Assessment (ESIA) are acted upon in a comprehensive and acceptable manner to meet World Bank and national requirements. The team will comprise the existing structures at the national, regional, district and community level i.e. Safeguards officer (PCU), Technical Coordination office (TCO), EPA Area office/WD and CWMTs/CRMCs.

The Project ESRM Team will be responsible for the following:

- Ensuring project's compliance with all relevant environmental, social, health and safety regulations.
- Liaising with all relevant regulatory bodies and organizations to ensure compliance.
- Formulating and reviewing environmental and social policies and practices associated with the projects.
- Assisting in the education and training of project staff in environmental, social and safety awareness.
- Making budgetary provisions for projects' environmental programmes.
- Undertaking environmental and social safeguard monitoring activities for the civil works.



### 8.3 Environmental Management Structure

The Project Coordinating Unit (PCU) and the Safeguard Officers are responsible, among others, for pre-project development as well as the post project implementation of all environmental and social-risk management activities.

The post-construction or operational phase environmental management will be incorporated into the relevant MMDAs Medium Term Development Plans (MTDP) and implemented by the beneficiary communities. To ensure that the environment is managed efficiently, requisite training shall be provided for the members of the Project Coordinating Unit, Beneficiary Agencies, and the Community Watershed Management Teams (CWMTs), CREMA Executive Committees (CEC)/Community Resource Management Committees (CRMCs).

#### 8.3.1 Project Coordinating Unit (PCU)

The PCU will be responsible for all project activities including management of environmental and social issues associated with the project.

The PCU is responsible for:

- Monitoring all environmental and social programs for pre-construction, construction and operational phases of the project, including issues relating to bio-physical and socio-cultural and economic components.
- Working closely with project contractors to ensure that all monitoring and mitigation guidelines, recommendations for the project are adhered to. This includes compliance with all health, social and safety guidelines outlined and environmental policy guidelines.
- Working closely and coordinating efforts with the EPA and other regulatory bodies including the MMDAs to ensure full compliance with all legal and regulatory requirements
- Organizing activities to motivate and maintain the interest of the project staff in social and environmental issues through training programs and review meetings
- Conducting investigations into all types of accidents and incidents
- Conducting environmental and social audits in accordance with project monitoring guidelines
- Serving as liaison between project contractors and the relevant regulatory agencies
- Developing a work plan for the implementation of the ESMP
- Establishing and running a reporting system on progress of implementing mitigation measures (including contractors' obligations), training, etc.

## 8.4 General Health and Safety Procedures

Procedures relating to occupational safety and health will be guided by the Occupational Safety and Health Policy for Ghana (Draft 2004), the Public Health Act, 2012 (Act 851) and the World Bank Group Guidelines on Environment, Health and Safety. Some highlights are provided below;

- Manual lifting
- Hearing protection
- Protective equipment
- Good house-keeping
- Fire prevention
- Prevention of falls from heights
- Electrical hazards
- Machinery safety
- Welding safety
- Head protection
- Feet protection
- Provision of first aid items

All the applicable occupational safety and health provisions in the Factories, Offices and Shops Act 328, (1970) shall be complied with during the implementation of the project. The mitigation measures recommended in the ESIA will also be fully implemented.

### 8.4.1 Fire Prevention and Safety System

The general fire precautions to be taken during construction and operation includes:

- ✓ The posting of “no smoking” signs at fire sensitive areas (e.g. fuel storage areas at the work camp, etc.)
- ✓ Provision of appropriate and adequate number of fire extinguishers
- ✓ Proper storage of rags used in cleaning hazards and containing flammable liquids (e.g. in metal containers for safe disposal)
- ✓ Handling of flammable materials by competent persons only
- ✓ Provision of emergency fire alarm systems

In addition, fire prevention and containment training would be carried out for all project employees at construction sites for civil works. . At the end of the training, the personnel would have adequate knowledge of all fire prevention systems recommended in the ESIA.

### 8.4.2 Change Management

The PCU recognizes that environmental and social issues that are covered by the project ESIA and ESMP could change (in terms of severity, magnitude, etc.) as the project proceeds. The Project Coordination Unit (PCU) will be responsible for change management. The PCU shall specifically undertake the following.

- ✓ Preview internal environmental reports.
- ✓ Monitor Project development, and observe significant issues as they arise.
- ✓ Make decisions about modifications to mitigation and monitoring needs and requirements.
- ✓ Advice on external reporting on environmental and social issues, as required.

### 8.4.3 Documenting Voluntary Donation of Community Lands

As their contribution, beneficiary communities have donated lands towards the delivery of the sub-projects. The Lands Act, 2020 (Act 1036) refers to such voluntary donation of land to the state as “gifts”, and emphasises the need for documentation. Per ESS 5, a Voluntary Land Donation (VLD), as a method of acquisition of land for a Bank project is allowed, provided that the conditions set out in the VLD protocol are met, and certain confirmations concerning the donation are made by the proponent. In this regard, an agreement template (**appendix 5**) for documenting VLDs has already been prepared. The template contains the conditions set out in the VLD protocol, and outlines the confirmations to be made as part of the documentation process.

It is important to clarify that the template is applicable to the facilities to be constructed in the fringe communities, as lands there are customary owned lands. However, in respect of the facilities to be constructed within the boundaries of the Mole National Park itself, the Lands Commission and Forestry Commission will advise about land allocations processes and documentation. Also, The PCU will work closely with the Lands Commission (LC) and Land Use and Spatial Planning Authority (LUSPA) offices responsible for the location of each land. For each location, LUSPA will confirm the conformity of the planned development with the land use plan of the area, and grant permits accordingly.

Before each agreement is signed/ executed with the relevant community representatives, a consultation session will be organized to sensitize the community people and their leaders on the agreement and its provisions. Any concerns raised would be addressed. A transparent record of all such consultations and agreements reached around the land donation will be kept by the PCU.

As part of the efforts to ensure transparency and inclusion in the consultations, any Customary Land Secretariat (CLS) that exists in any location for a sub-project would be involved in the

processes, and copies of executed agreements would be lodged with the CLS for safekeeping on behalf of their communities, aside copies to be given to the community leadership.

## **8.5 Cost of Environmental Management**

The PCU will make human resources available for environmental management and enhancement. In addition, financial provision shall be made to ensure that mitigation measures (including compensation), monitoring and training programs are effectively implemented. The PCU will make the necessary budgetary provisions to cover all commitments for the construction and management of the water systems (dugouts, waterholes, and boreholes), viewing platform, processing facilities. Budgetary provision for environmental management during construction will be part of the contractor's cost and would be adequately provisioned for.

## **8.6 Environmental Management during Construction Phase**

The construction phase negative impacts identified in the EIA will be directly associated with the activities of the contractor. E&S management during the construction phase is essentially concerned with controlling impacts, which could result from the activities of the Contractor. This would be done through the enforcement of Contract Clauses which relate to environmental and social protection. These clauses will have effect if they are fully implemented and enforced.

The PCU will therefore ensure compliance through the following measures:

- Monitor the progress of the contractor in implementing the mitigation measures outlined in the Contract documents and ESIA as well as the contractor ESMP.
- Liaising with regulatory bodies to ensure that policies, procedures and environmental management issues are complied with.
- Coordinating parties involved in the impact mitigation and enhancement process, including: contractors, consultants, as well as the general public

## **8.7 Environmental and Social Management Responsibilities**

The negative impacts expected from the project were outlined and the corresponding mitigation measures were also proposed for implementation. An important consideration for this project is the implementation phase where the immediate environment could be degraded.

The key stakeholders in the environmental management of the project are the Engineer (designer and supervisor), the Contractor and the general public. The plan outlined below allocates the responsibility for implementation of the proposed mitigation measures to the various stakeholders.

### 8.7.1 Environmental Management Responsibilities of the Engineer

- Design the project for the least negative environmental impact during the construction and operational phases of the project
- Design the project for environmentally friendly construction methods
- Design the project prescribing materials with the least negative environmental impact.
- Incorporate any feasible safety measures within the project design
- The Engineer shall incorporate all suitable clauses requiring the contractor to execute his work with due diligence and applying environmentally friendly methods. Any such requirement must be accompanied by the necessary methods for monitoring and enforcement. Clauses with principle content as outlined below are considered as the minimum requirement
- Monitor the overall environmental and social impacts of the project and recommend additional mitigation measures for implementation when deemed necessary.

The Engineer will supervise and enforce the Contractors' performance on all environmental requirements included in the Contract Documents.

- The Engineer will monitor the overall environmental impact of the project and recommend additional mitigation measures for implementation when deemed necessary
- The Engineer will liaise with the local health and educational authorities to plan and implement an agreed awareness raising campaigns on issues of health and safety, GBV/SEA/SH, child labour and grievance redress.

### 8.7.2 Environmental Management Responsibilities of the Contractor

The responsibilities of the contractor are indicated below;

- Mobilization: - Ensure that all staff, including managers and foremen are well informed about all environmental/social (including GBV/SEA/SH and grievance mechanism) issues of the project, and ensuring that they all sign on to a Code of Conduct (CoC) that explicitly include expectations and consequences for GBV/SEA/SH-related misconduct
- Ensure that all site managers and foremen are trained in environmentally friendly construction methods
- Ensure that all equipment mobilized fulfil the environmental requirements for the Contract Document
- Obtain necessary approvals for all borrow pits

- Requirement for the Contractor to prepare and submit plans for borrow pit management for approval by the relevant authorities and the Engineer in due time before starting any clearing activity at the site
- Establish a waste management plan comprising all types of wastes
- Apply environmentally friendly equipment and construction methods
- The Contractor is responsible for maintaining and operating own and sub-contractors equipment in accordance with the original manufacturer's specifications and service manuals to control noise, vibrations and particulate emissions. Faulty equipment must be rectified or replaced within 24 hours of being given notice.
- Ensure occupational health and safety for all workers and visitors to the sites.
- Fulfil all environmental requirements of the Contract Document
- Inform the Supervising Engineer if any unforeseen negative environmental impact should occur Ensure that all affected project areas have been properly cleaned of waste, graded and re-vegetated
- The Contractor is responsible for providing safe passage around or through his work site.
- The contractor is responsible for conducting the necessary community entries, developing appropriate relationships with community folks and leadership, properly implementing the grievance redress mechanism, communicating proactively and conducting meaningful consultations with community people, providing the required sensitisation to manage risks of GBV/SEA/SH and child labour as well as managing any potential risk of influx of migrant workers.
- The contractor must have adequate relevant knowledge of the rules and regulation for environmental protection in Ghana which must include;
  - Noise nuisance
  - Air quality
  - Water pollution
  - Waste management

## **8.8 Reviews Based on Monitoring Outcomes**

There will be continuous monitoring of the project activities during both the construction and operation phases. The outcome of these monitoring activities may require changes in the proposed mitigation measures to improve upon their effectiveness and adequacy. The monitoring plan is therefore very key to this ESMP.

## 8.9 Programme to meet Requirements of the ESMP

The programmes proposed to enhance mitigation measures and monitoring programmes include the following:

- Development and Implementation of a Construction Management Plan;
- Adoption of Environmental Health and Safety Plan;
- Environmental Health and Safety Committee
- Contractors' ESMP (including the Community Safety and Traffic Management Plan, and the Occupational Health and Safety Plan)
- Workers' training and awareness creation
- Environmental and Social Monitoring Programme
- Community Safety and Traffic Management Plan
- Occupational Health and Safety Plan
- GBV/Sexual Harassment & Abuse
- Child labour
- Management Plan and Training/Capacity Building
- Emergency Response Plan with respect to the potential issues relating to the operational efficiencies and management of the GLRSSMP civil works and infrastructure facilities
- Public and community participation;
- Grievance Redress Mechanism
- Environmental and Social Audits and Reviews;

### 8.9.1 Development and Implementation of Construction Management Plan (CMP)

The GLRSSMP-EPA PCU will require bidders for the GLRSSMP civil works to develop and implement a Construction Management Plan. This requirement will be spelled out in the GLRSSMP Civil works' contract, which will be performance-based. The plan will cover the following:

- Introduction - Indicating the contract Administrative Jurisdiction, Site Location, Site Overview and Development Overview.
- Construction Programme and Phasing.
- Site Establishment - Site Office and Compound, Site Hoarding and Security, Construction Personnel Numbers, Site Access (Pedestrian and Vehicle Access), Construction Vehicle Numbers, Onsite Construction Parking, Logistics Planning
- Site Monitoring and Management including Noise Monitoring, Vibration Monitoring, Air Quality, Dust Control and Monitoring, Site Management and Security, Covered Vehicles and Dust Suppression.
- Substructure and Superstructure Construction Methodology.

- Health and Safety including General Health, Safety and Environmental Considerations, Control of Substances Hazardous to Health, Environmental, Emergency and Accident Procedure.
- Construction Stage Community Liaison indicating Code of Practices, Respect for the Community, Community Liaison Manager and Community Programmes.

### **8.9.2 Adoption of Environmental, Health and Safety Management Plan**

The Contractor shall develop an environmental, health and safety plan to guide the sustainable implementation of the project. The GLRSSMP-EPA PCU shall ensure that contractors implement the EHS Plan. The plan, which should include Code of Conduct, GBV/SH/SEA, child labour issues and standard operating procedures, will serve to guide the workers in their daily activities and also serve as a training manual for in-service training as well as induction of new workers engaged on the project.

### **8.9.3 Contractors' ESMP (C-ESMP)**

The contractors executing the various GLRSSMP civil works will prepare a Contractor's ESMP to be approved by the GLRSSMP-EPA PCU prior to the commencement of civil work works. The C-ESMP will be used for the implementation of the various environmental and social actions aimed at managing various potential impacts and risks from construction of the GLRSSMP Civil works.

The following outline can be considered by the Contractor as a guide for preparation of the C-ESMP:

- Introduction
- Brief Description of the Civil work and Construction Activities
- Legal and Other Requirements
- Roles and Responsibilities
- Environmental and Social Management
- Health and Safety Management
- Community Liaison and Grievance Redress
- Compliance and Monitoring
- Incidents, Non-Conformance and Preventive Actions
- Reporting;
- Implementation Schedule and Cost Estimates, and
- Conclusion.



#### **8.9.4 Worker's Training and Awareness Creation**

The contractor will ensure effective dissemination of information to all staff on the GLRSSMP civil works. Training programmes will be regularly organised on environmental, health and safety. These will include formal in-service training, and induction for new staff. The trainings will include the following:

- EHS policies and procedures;
- Worker Code of Conduct
- Standard operating procedures;
- Machine/equipment handling and operation;
- Road safety and traffic regulations;
- Public health and sanitation;
- Gender-based violence/Sexual harassment/Sexual exploitation and abuse, child labour
- Emergency response; and
- Occupational health and safety, including First aid.

#### **8.9.5 Environmental and Social Monitoring Programme**

Comprehensive monitoring programmes will be developed based on the monitoring plan provided in Section 11 for relevant environmental and social monitoring parameters.

#### **8.9.6 Archaeological and Cultural Heritage Chance Find Procedure**

In the event of finding previously unknown sites or feature of archaeological or cultural value during project implementation, the following standard procedures for identification, protection from theft, treatment and recording should be followed.

Specifically, the procedures will be to

- (a) Stop the activities in the area of the chance find.
- (b) Delineate the discovered site or area.
- (c) Secure the site to prevent any damage or loss of removable objects.
- (d) Notify the Supervising Engineer who in turn will notify the responsible authorities.
- (e) The Ministry of Tourism, in collaboration with responsible local authorities (where applicable), would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures.
- (f) The Ministry of Tourism and National Museums and Monument Board will make decisions on how to handle the findings. This could include changes in the layout (such as when finding irremovable remains of cultural or archaeological importance), conservation, restoration, and salvage.

- (g) The Ministry of Tourism shall communicate implementation of the authority decision concerning the management of the finding in writing.
- (h) Construction work could resume only after permission is given from Ministry of Tourism or other responsible authorities concerned with safeguarding the cultural heritage.

These procedures shall be referred to as standard provisions in construction contracts, E&S Procedures for Inclusion in the Technical Specifications for Contracts. During project supervision, the Site Engineer shall monitor the above regulations relating to the treatment of any chance find encountered. Relevant findings will be recorded in the Monitoring Reports.

### **8.10 Grievance Redress Mechanism**

The GLRSSMP and the African Environmental Health and pollution Management Project (AEHPMP) which are World Bank investment projects have developed a Grievance Redress Mechanism (GRM). The objective of the Grievance Redress Mechanism (GRM) is to provide clear channels and platforms for receiving and addressing complaints raised by project affected persons (PAPS), communities and other interest groups on the implementation of project activities in a timely, impartial and transparent manner. The GRM consists of four levels and has various structures within these levels for receiving of complaints and addressing them. Complaints are escalated to the next higher level if they are not resolved. For the purpose of this report the levels and structures mentioned below are for the landscape component of the GLRSSMP

#### **Community Level**

At the community level the structures for receiving and resolving complaints are; community watershed management team (CWMT) for farmers in beneficiary communities and community resource management committee (CRMC) for CREMA beneficiary communities.

#### **District Level**

At the district level two structures namely the district watershed management (DWMTs) and the protected areas management advisory units (PAMAUs).

#### **Regional Level**

The main regional structure for the Landscape component of the GLRSSMP is the two (2) Technical Coordination Offices in Bolgatanga for the northern savannah zone and in Kumasi for the transitional and cocoa forest landscape area. All the beneficial and implementing Agencies are represented in the TCO.

## National Level

At the national level, all complaints from all the other three levels resolved or unresolved will be sent to the main portal. The EPA Project Coordinating Unit (PCU) manages this portal through the Client Relations Unit (CRU).

However, gender based violence, sexual exploitation abuse/sexual harassment and child labour (GBV/SEA/SH, CL) complaints will be referred to the Domestic Violence and Victim Support Unit (DOVVSU) of the Ghana Police and the Department of Social Welfare to address such complaints and wherever such situations occurs the committee at that level will have the duty to map out public or private institutions whose operations cover such offences to also assist in addressing such issues. These national institutions shall provide feedback information to the EPA-PCU and consequently to victims.

The various structures will be provided with complaint receiving forms developed to administer complaints and for record purposes (see annex 7). In addition active telephone numbers of beneficiary institutions (EPA, MoFA, WD and FSD) in the district will also be provided for the community structures for any clarification they may require concerning complaints. Field officers i.e. EPA PCU Safeguards officers, MoFA Schedule officers and Agricultural Extension Agents will always be available to assist community structures to administer complaints at that level.

### 8.10.1 Workers GRM

Contractors engaged by the project shall be made to implement the GRM system which is part of their contractors environmental and social management plans (CESMP) which forms an integral part of the contractual agreement documents approved by the PCU. The GRM will ensure that complaints from workers engaged by the contractor shall be received and addressed in a timely and transparent manner. A complaint log will be made available to contractors for record and monitoring purposes.

## 8.11 Environmental and Social Budgeting

An amount of **USD 135,000 (excluding contractor and design consultant cost)** will be required for environmental management including monitoring and reporting as shown in Table 8-14.

Table 8-14: Estimated Budget for Environmental and Social Management

No	Activity	Cost/p.a (USD)
1	Implementation of mitigation measures-ESMP (see Table 9-2):	

	<ul style="list-style-type: none"> <li>Construction Phase</li> </ul>	In contractor's fees
	<ul style="list-style-type: none"> <li>Operational Phase</li> </ul>	In project's Environment and safeguard Budget
2	Training and Capacity Building (See Table 9-2)	70,000.00
3	Environmental Auditing and Reporting: Quarterly environmental, health and safety audits Returns of Monitoring Reports to EPA (In compliance with LI 1652) Preparation of Environmental and Social Management Plan every 3 years (In compliance with LI 1652)	15,000.00
4	Environmental and Social Monitoring Plan (See Table 10-1)	50,000.00
5	ESMP and Implementation of Grievance Redress Mechanism (Existing GLRSSM-EPA-PCU Budget)	-
	<b>Total</b>	<b>135,000.00</b>

Table 8-15: Environmental and Social Management Plan: Proposed Civil Works in and around Digya National Park

No	Potential Impacts	Key Mitigation Measures	Objective	Budget/Cost (USD)	Timeframe	Responsibility
<b>Construction Phase</b>						
1	Biodiversity	<ul style="list-style-type: none"> <li>Careful site selection for the infrastructure</li> <li>Development of Biodiversity management plan if requires</li> <li>Careful planning and timing of construction activities.</li> <li>Limit clearing to only designated areas needed for the infrastructure</li> <li>Reforestation of felled trees to be done by the FSD and Wildlife as per PCU activity</li> </ul>	<ul style="list-style-type: none"> <li>To protect key habitat</li> <li>To avoid areas of conservation interest</li> </ul>	<ul style="list-style-type: none"> <li>In Contractor's fees</li> <li>WD Budget (PCU)</li> </ul>	<ul style="list-style-type: none"> <li>Engineering Design and Construction</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> <li>DNP Management (Ecologist)</li> <li>PCU (WD&amp;FSD)</li> </ul>
2	Ambient Air Quality/Noise	<ul style="list-style-type: none"> <li>Regular servicing and maintenance of construction equipment</li> <li>Water dousing in dry construction areas</li> <li>Limit the use of horns in the community</li> </ul>	<ul style="list-style-type: none"> <li>Minimize particulate matter emission</li> <li>Reduce noise nuisance</li> </ul>	Safeguards budget (PCU)	Construction	Contractor, GLRSSMP-EPA PCU
3	Disturbance to waterbodies/erosion and siltation	<ul style="list-style-type: none"> <li>For in-stream works, use isolation techniques such as diversion during construction to limit the exposure of disturbed sediments to moving water.</li> <li>Exposed surfaces will be compacted as much as possible</li> </ul>	<ul style="list-style-type: none"> <li>To limit the exposure of disturbed sediments to moving water</li> </ul>	<ul style="list-style-type: none"> <li>In Contractor's fees</li> </ul>	<ul style="list-style-type: none"> <li>Engineering Design and Construction</li> </ul>	<ul style="list-style-type: none"> <li>Contractor</li> </ul>
4	Visual intrusion/aesthetics	Construction sites will be fenced For construction activities in the park, materials or appropriate colours will be used	Not to disturb the aesthetics in the park / community	In Contractor's fees	Design and construction	Contractor

No	Potential Impacts	Key Mitigation Measures	Objective	Budget/Cost (USD)	Timeframe	Responsibility
5	Fire Hazard and other emergencies	<p>Petroleum products and other fire flammable materials are kept appropriately</p> <p>Ensure activities that are likely to cause fire are prevented</p> <p>Creation of fire belts around construction sites and dealing with emergency situation through collaboration between contractors and park management</p> <p>Provision of first aid facilities to deal with emergencies</p>	<p>Eliminate the risk of fires and</p> <p>Reduce the incidence of fire at construction sites</p>	PCU Budget	Construction	Contractor
6	Solid and liquid wastes	<ul style="list-style-type: none"> <li>▪ Establishing a waste management hierarchy at the construction site</li> <li>▪ Construction waste should be disposed of in partnership with the Assembly</li> <li>▪ Provide sanitary facilities for construction workers</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ensure proper management of solid and liquid waste</li> </ul>	<ul style="list-style-type: none"> <li>▪ In Contractor's fees</li> </ul>	<ul style="list-style-type: none"> <li>▪ Engineering Design and Construction</li> </ul>	<ul style="list-style-type: none"> <li>▪ Contractor</li> </ul>
7	Social Conflict	<ul style="list-style-type: none"> <li>▪ Fenced off construction sites to prevent falls and accidents</li> <li>▪ Sensitize the community on the objectives of the project</li> <li>▪ Contractor to use local labour as much as possible</li> </ul>	<ul style="list-style-type: none"> <li>▪ Ensure social cohesion between the project, contractor and community</li> </ul>	<ul style="list-style-type: none"> <li>▪ In Environmental and social safeguards budget</li> </ul>	<ul style="list-style-type: none"> <li>▪ Engineering Design and Tendering</li> <li>▪ construction</li> </ul>	<ul style="list-style-type: none"> <li>• District Assembly/</li> <li>• PCU E&amp;S Safeguards Officer</li> <li>• Contractor</li> </ul>
8	Community Health and Safety	<ul style="list-style-type: none"> <li>▪ Create awareness on the construction activities including schedules of work</li> <li>▪ Promote education among workers to reduce the transmission of HIV/AIDS and other sexually transmitted diseases (STDs).</li> </ul>	<ul style="list-style-type: none"> <li>▪ To ensure community safety and prevent transmission of STDs</li> </ul>	<ul style="list-style-type: none"> <li>▪ In Environmental and social safeguards budget</li> </ul>	<ul style="list-style-type: none"> <li>▪ Engineering Design and Tendering</li> <li>▪ construction</li> </ul>	<ul style="list-style-type: none"> <li>• PCU E&amp;S Safeguards Officer</li> <li>▪ Contractor</li> </ul>

No	Potential Impacts	Key Mitigation Measures	Objective	Budget/Cost (USD)	Timeframe	Responsibility
9	Occupational Health and Safety issues (accidents, injury/ailments to workers)	<ul style="list-style-type: none"> <li>▪ Provision of appropriate PPEs and ensure their use</li> <li>▪ Develop labour management plan</li> <li>▪ Continuous education and awareness on safety working</li> </ul>	<ul style="list-style-type: none"> <li>▪ To ensure workers are safe from occupational risk and hazards</li> </ul>	<ul style="list-style-type: none"> <li>▪ In Environmental and social safeguards budget</li> </ul>	<ul style="list-style-type: none"> <li>▪ Engineering Design and Tendering</li> <li>▪ construction</li> </ul>	<ul style="list-style-type: none"> <li>▪ PCU E&amp;S Safeguards Officer</li> <li>▪ Contractor</li> </ul>
10	Child labour and abuse of construction workers	<p>Contractors to engage the right category of persons for construction work in accordance with ESS 2 and Ghana's Labour Law</p> <p>Verification of age of prospective workers with available means (photo identification)</p> <p>Workforce and contractors will be sensitized on what child labour is, and why it is harmful to children, age verification of workers will be undertaken</p>	To prevent Child labour and abuse of construction workers	In Environmental and social safeguards budget	Engineering Design and Tendering construction	<ul style="list-style-type: none"> <li>• PCU E&amp;S Safeguards Officer</li> <li>▪ Contractor</li> </ul>
11	GBV/SH/SEA	<ul style="list-style-type: none"> <li>▪ Contractor to ensure all workers sign and abide by the code of conduct on GBV and SEA/SH</li> <li>▪ Sensitize the community on the project GRM especially on reporting of incidences</li> </ul>	<ul style="list-style-type: none"> <li>▪ To prevent workers from sexually exploiting community members</li> </ul>	<ul style="list-style-type: none"> <li>▪ In Environmental and social safeguards budget</li> </ul>	<ul style="list-style-type: none"> <li>▪ Engineering Design and Tendering</li> <li>▪ construction</li> </ul>	<ul style="list-style-type: none"> <li>• PCU E&amp;S Safeguards Officer</li> <li>▪ Contractor</li> </ul>
<b>Operational Phase</b>						
1	Water Quality	Appropriate notices such as 'do not defecate', 'do not farm' will be posted in the vicinity of the dugout, waterholes and boreholes	Avoid pollution of the water systems	<ul style="list-style-type: none"> <li>▪ In Environmental and social safeguards budget</li> </ul>	Operational period	<ul style="list-style-type: none"> <li>▪ PCU E&amp;S Safeguards Officer</li> </ul>
2	Potential Drowning/Fall from Viewing platform	<ul style="list-style-type: none"> <li>• Warning notice will be posted to indicate 'no swimming', 'danger of drowning' etc.</li> </ul>	To ensure community safety	<ul style="list-style-type: none"> <li>▪ In Environmental and social</li> </ul>	Operational period	<ul style="list-style-type: none"> <li>▪ PCU E&amp;S Safeguards Officer</li> <li>▪ Community</li> </ul>

No	Potential Impacts	Key Mitigation Measures	Objective	Budget/Cost (USD)	Timeframe	Responsibility
		<ul style="list-style-type: none"> <li>There will be extensive education in the communities on the use of the water including how to prevent the risk of drowning.</li> </ul>		safeguards budget		
3	Social Conflict	<ul style="list-style-type: none"> <li>A Facility Management Committee will be put in place in all the beneficiary communities to oversee the use and management of the water               <ul style="list-style-type: none"> <li>A grievance redress mechanism will be put in place as part of the management of the dugout. This will spell out the processes for reporting and resolving the conflicts</li> <li>Facility usage mechanisms among the communities will be developed to allow for the use of the processing facility</li> </ul> </li> </ul>	Improve cohesion among fringe communities	<ul style="list-style-type: none"> <li>In Environmental and social safeguards budget</li> </ul>	Operational Period	<ul style="list-style-type: none"> <li>PCU E&amp;S Safeguards Officer</li> <li>Community</li> </ul>
4	Fire	<ul style="list-style-type: none"> <li>Education and awareness creation on fire management practices</li> <li>Undertake tree growing along the boundaries of the water systems</li> <li>provision of fire extinguishers and other equipment as recommended by the Ghana national Fire Service</li> </ul>	Ensure the infrastructures are protected from fires	<ul style="list-style-type: none"> <li>In Environmental and social safeguards budget</li> </ul>	Operational period	<ul style="list-style-type: none"> <li>E&amp;S Safeguards Officer</li> <li>Community</li> </ul>
5	Effluent Discharge	<ul style="list-style-type: none"> <li>Bio-fill or digesters to be installed as treatment options. Where not feasible septic tanks to be provided for toilet facilities</li> </ul>	Ensure proper management of Effluents	<ul style="list-style-type: none"> <li>In Environmental and social safeguards budget</li> </ul>	Operational period	<ul style="list-style-type: none"> <li>E&amp;S Safeguards Officer</li> <li>Community</li> </ul>



No	Potential Impacts	Key Mitigation Measures	Objective	Budget/Cost (USD)	Timeframe	Responsibility
		<ul style="list-style-type: none"> <li>Waste water from processing facilities will be discharged in accordance with the Ghana Standards for Environmental protection- requirements for Effluent discharge (1212:2019)</li> </ul>				
6	Solid Waste	<ul style="list-style-type: none"> <li>Solid waste generated will comply with the District Assembly's by-laws on waste management</li> <li>Segregation of solid waste and disposed of at approved waste disposal sites</li> <li>Recycling and Reuse</li> </ul>	Ensure proper management of solid	<ul style="list-style-type: none"> <li>In Environmental and social safeguards budget</li> </ul>	Operational period	<ul style="list-style-type: none"> <li>E&amp;S Safeguards Officer</li> <li>Community</li> </ul>
7	Occupational Health and Safety	<ul style="list-style-type: none"> <li>Provision of personal protective clothing, such as hard boots, helmets, nose masks, ear-muffs and overalls to all workers, and enforcing its proper use</li> <li>Provision and maintenance of well-stocked first-aid facilities, with at least, to treat minor injuries and ailments.</li> <li>Workers who get involved in accidents or suffer major injuries will be transported quickly to a hospital to seek professional medical help;</li> <li>Train processing facility operators in OHS</li> </ul>	To ensure workers are safe from occupational risk and hazards	<ul style="list-style-type: none"> <li>In Environmental and social safeguards budget</li> </ul>	Operational period	<ul style="list-style-type: none"> <li>E&amp;S Safeguards Officer</li> <li>Community</li> </ul>
8	Noise	<ul style="list-style-type: none"> <li>Regular servicing and maintenance of processing equipment</li> </ul>	Reduce noise nuisance	In Environmental	Operational phase	E&S safeguards officer

No	Potential Impacts	Key Mitigation Measures	Objective	Budget/Cost (USD)	Timeframe	Responsibility
		<ul style="list-style-type: none"> <li>Ensure compliance with Ghana Standards for Health Protection - Requirements for Ambient Noise Control (GS 1222, 2018)</li> </ul>		and social safeguards budget		

## 9.0 INSTITUTIONAL ARRANGEMENTS

This section sets out the institutional framework for implementing the measures including where further strengthening is required or where Environmental Protection Agency which is the coordinating unit for the project may be required to put additional measures in place for the GLRSSMP civil works. The Directorate of Crop Services and the Wildlife Division of the Forestry Commission who are beneficiary institutions are under the umbrellas of the Ministry of Food and Agriculture (MOFA) and Ministry of lands and Natural Resources (MLNR) respectively. Additionally, proposed institutional responsibilities for both the construction and operation phases as well as the monitoring of the proposed projects have been defined in table 9-16 below.

Table 9-16: Institutional Roles and Responsibilities

Institution	Responsibility	Phase of Implementation
Environmental Protection Agency / GLRSSMP-EPA-PCU	<ul style="list-style-type: none"> <li>▪ Overall responsibility for the design and implementation of the Sub- Projects under component 3 of GLRSSMP,</li> <li>▪ Lead community entry processes with community leaders and chiefs disclosing project objectives and documentation of VLD processes</li> <li>▪ Implementation, management, oversight, and monitoring of the project interventions</li> <li>▪ Enter into and manage contracts with Contractors/Consultants including the ESIA Consultant and Design Consultants.</li> <li>▪ Ensure all design measures proposed in the ESIA are incorporated in the project design and implemented.</li> <li>▪ Ensure all necessary environmental reports, permits and approvals such as ESIA, environmental permits, etc. are prepared/ obtained for the project.</li> <li>▪ Ensure that all measures during the pre-construction phase are addressed by the GLRSSMP-EPA-PCU and the Supervision Consultants</li> <li>▪ Managing administrative processes and related reporting, and public/community relations.</li> <li>▪ Supervision of contractor(s) and works at the GLRSSMP CIVIL WORK sites</li> <li>▪ Lead in addressing grievances</li> <li>▪ Facilitate/support stakeholder engagement</li> </ul>	Project lifespan (design and implementation)
Forestry Commission/Wildlife Division/MoFA	<ul style="list-style-type: none"> <li>▪ Responsible for the monitoring and evaluation of project activities which include reviewing of design</li> </ul>	Project lifespan (design and implementation)

<b>Institution</b>	<b>Responsibility</b>	<b>Phase of Implementation</b>
(Directorate of Crop Services)	<ul style="list-style-type: none"> <li>and other reports submitted by all project consultants to the Agency</li> <li>Ecologist from WD (MNP) will assess biodiversity and habitat change</li> </ul>	
Design Consultant/ Supervising Engineer	<ul style="list-style-type: none"> <li>Responsible for the E&amp;S Due Diligence, design and overall supervision of construction works and conduct of the contractor.</li> <li>Ensure environmental and social management considerations in the project design are implemented during construction.</li> </ul>	Pre-Construction, Construction, Operation and Decommissioning Phases
Contractor	<ul style="list-style-type: none"> <li>Implement all environmental and social management measures in the project designs and ESIA/ESMPs during construction.</li> <li>Responsible for environmental and social management of the project during construction.</li> <li>Responsible for the health and safety and welfare of workers and communities during construction.</li> </ul>	Construction
Traditional Authorities/Opinion Leaders	<ul style="list-style-type: none"> <li>Local needs definition and prioritisation</li> <li>Local knowledge and values</li> <li>Community planning and mobilisation</li> <li>Mobilisation of local assets and resources</li> <li>Monitoring and evaluation</li> <li>Internal organisation and conflict resolution</li> </ul>	Project lifespan (design, construction, operation and maintenance and monitoring)
NGOs/CBOs	<ul style="list-style-type: none"> <li>Local needs assessment</li> <li>Community mobilisation and participation in project delivery</li> <li>Community project design and implementation</li> <li>Leverage external funding for community support</li> <li>Monitoring and evaluation</li> </ul>	Project lifespan (design, construction, operation and maintenance and monitoring)
Respective Beneficiary Municipal/District Assemblies	<ul style="list-style-type: none"> <li>Collaborate with various consultants to manage communication and information dissemination to the public during the project duration</li> <li>Assist with community sensitization/ engagements</li> <li>Monitoring</li> <li>Play a role in grievance resolution.</li> </ul>	Project lifespan (design, construction, operation and maintenance and monitoring)
Operator of the Proposed facilities/ Project/Beneficiary communities	<ul style="list-style-type: none"> <li>Ensures the necessary water users committee is put in place and manages the water systems</li> <li>Ensures sustainable use of the infrastructures</li> <li>Ensures the communities structures are put in place to manage the processing facilities</li> </ul>	Project lifespan (operation and maintenance)

## 9.1 Training/Capacity Building for Environment, Health and Safety Management

The training and capacity building requirements to ensure successful environmental, health and safety management of the GLRSSMP sub-projects is provided in Table 9-17.

Table 9-17: Training and Capacity Building Requirements

No	Activity	Target Group/ Participants	Timeline/Duration	Proposed Facilitator	Estimated Cost/(US\$)
1.	Induction on environmental and social management, occupational and public health and safety requirements of the GLRSSMP sub-project activities	Contractors' workers	Prior to commencement of GLRSSMP sub-project activities	GLRSSMP -EPA-PCU E&S Specialists	10,000.00
2	Training on environmental and social management, occupational and public health and safety requirements of the GLRSSMP sub-project activities	Contractor's workers/ Operators of processing facilities/ beneficiary communities	During project construction and operational phases	GLRSSMP -EPA-PCU E&S Specialists	15,000.00
3.	- Public sensitization on GRM and SEA/SH and GBV and child labour - Human rights regulations in Ghana - Sanctions against culprits and remedies for victims	-General public	Throughout project duration	GLRSSMP -EPA- PCU/Benef iciary Municipal Assemblies	10,000.00
4.	Cultural heritage and its relevance in sustainable development Procedures used in Chance Find (CF)	- E&S officers - Site Supervisors - Site Engineers - Formal site workers	Pre-constructional phase	- Safeguards Specialist/ Consultant - Resource persons from National Museums &	10,000.00

No .	Activity	Target Group/ Participants	Timeline/Duration	Proposed Facilitator	Estimated Cost/(US\$)
				Monument Board	
5.	- Community and project workers relationships - Stakeholder engagements in project development - Grievance Redress mechanism	Beneficiary Communities	Throughout project duration	Community development Specialist/ Communications Specialist	15,000
6.	- Workplace Security - Preventive Measures - Emergency response procedures - Evacuation procedures etc.	Contractors and workers	Pre-construction and Construction phases	Ghana Police Service	10,000
<b>TOTAL COST</b>					<b>70,000.00</b>

## 10.0 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

This section presents a detailed Environmental and Social Monitoring Plan (ESMP-Monitoring) to guide the monitoring of the environmental and social impacts and the implementation of mitigation and enhancement measures during the construction and operation phases. The monitoring plan will enable the EPA to confirm the effectiveness or otherwise of the mitigation measures contained in the ESIA and help enhance the effectiveness of the implementation of the mitigation measures.

The ESMP-Monitoring presents the comprehensive monitoring plan developed for the GLRSSMP Sub projects for all the potential substantial adverse environmental and social risks/impacts identified, assessed and mitigated in earlier sections of the report (See Chapters 6, 7 and 8). The monitoring plan includes identification of the responsible institutions or persons and estimated budget /cost requirements.

The ESMP-Monitoring includes social and environmental protection measures/indicators addressing at a minimum:

- Documentation of voluntary land donations in fringe communities.
- Grievance redress system operationalisation and management
- GBV/SEA/SH and child labour case management
- Workers' rights and responsible labour behaviour.
- Induced development, both short term during construction and long term, from the presence of the Project.
- Occupational health and safety requirements for workers, including HIV/AIDS awareness strategy.
- Project related incidents such as traffic accidents and risks to public safety.
- Waste management, including construction and operation wastes and hazardous wastes.
- Security issues including material and equipment storage and potential vandalism.
- Removal of vegetation and measures for landscaping.
- Archaeological/cultural protection.
- Potential soil/water pollution.
- Ongoing information disclosure, consultation and engagement in next project phases, and
- Management systems and capacity for implementing them.

Table 10-18: Environmental and Social Monitoring Plan

Environmental/Social Component	Monitoring Parameters	Frequency	Method	Location	Responsibility	Cost Estimates (GHS) per annum
<b>Construction Phase</b>						
Biodiversity	<ul style="list-style-type: none"> <li>Key habitat, areas of conservation interest</li> </ul>	Monthly	Observation and logging	Construction areas	Contractor DNP Management (Ecologists)	WD Budget (PCU)
Ambient air quality	<ul style="list-style-type: none"> <li>Dust emissions: TSP + PM10</li> </ul>	Monthly	Instrument	Construction sites	Contractor/ Safeguards officer	In contractor's fees
Noise Levels	<ul style="list-style-type: none"> <li>Leq, Lmax, Lmin (dBA)</li> </ul>	Spot monitoring near sensitive receptors, and upon receiving complaints	Instrument	Construction sites	Contractor/ Safeguards officer	In contractor's fees
Occupational Health, safety, environment	<ul style="list-style-type: none"> <li>Record of PPE disbursed</li> <li>Good housekeeping practices</li> </ul>	Continuous	Observation and logging	Construction sites	Contractor/ Safeguards officer	In contractor's fees
Public Complaints and Grievances	<ul style="list-style-type: none"> <li>Type and nature of complaints and concerns;</li> <li>Complaint records (Record of grievance and number resolved/unresolved)</li> </ul>	Weekly	Records	Project area	Contractor/ Safeguards officer	Included in Grievance Redress Budget



Environmental/Social Component	Monitoring Parameters	Frequency	Method	Location	Responsibility	Cost Estimates (GHS) per annum
	<ul style="list-style-type: none"> <li>Management and Stakeholder Meetings</li> </ul>					
Gender Based Violence/Child Abuse/SH/SEA	<ul style="list-style-type: none"> <li>Number of cases reported to the Grievance Redress Committee/Safeguards officer</li> <li>Number of conflicts/cases dealt with by the Grievance Redress Committee / Safeguards Officer</li> <li>Number of crimes such as theft, defilement and rape reported, investigated, and concluded by the police involving the Contractor's worker</li> </ul>	As and when	Record	Project area	Contractor/Safeguards officer	10,000
Child Labour	<ul style="list-style-type: none"> <li>Employee documents confirming age i.e. voter ID, NHIS card, SSNIT</li> <li>Presence of a Child Labour Policy</li> </ul>	As and when	Records	Project area	Contractor/Safeguards officer	15,000

Environmental/Social Component	Monitoring Parameters	Frequency	Method	Location	Responsibility	Cost Estimates (GHS) per annum
<b>Operation Phase</b>						
Public Complaints and Grievances	<ul style="list-style-type: none"> <li>▪ Type and nature of complaints and concerns;</li> <li>▪ Complaint records (Record of grievance and number resolved/unresolved)</li> <li>▪ Management and Stakeholder Meetings</li> </ul>	Weekly	Records	Project area	Safeguards Officer	10,000
Community health and safety	<ul style="list-style-type: none"> <li>▪ Incidence of drowning</li> <li>▪ Record of safety awareness training</li> <li>▪ Cases reported and dealt with respect to use of water systems</li> </ul>	As and when	Records	Water systems site	Safeguard officer/community leaders	15,000
Waste Management (liquid and Solid)	<ul style="list-style-type: none"> <li>▪ Components of waste generated</li> <li>▪ Quantity generated</li> <li>▪ Quantity disposed</li> <li>▪ Quantity reused</li> <li>▪ Quantity recycled</li> </ul>	Monthly	Records	Processing facilities	Safeguard officer/CWMTs and CRMCs	5,000

<b>Environmental/Social Component</b>	<b>Monitoring Parameters</b>	<b>Frequency</b>	<b>Method</b>	<b>Location</b>	<b>Responsibility</b>	<b>Cost Estimates (GHS) per annum</b>
Fire	<ul style="list-style-type: none"> <li>Number of fire incidences</li> </ul>	As and When	Records	Processing facilities	Safeguard officer/ CWMTs and CECs/CRMCs	5,000
Noise Levels	<ul style="list-style-type: none"> <li>Leq, Lmax, Lmin (dBA)</li> </ul>	<ul style="list-style-type: none"> <li>Spot monitoring near sensitive receptors, and upon receiving complaints</li> </ul>	Instrument	Processing facilities site	Safeguards officer	5000
<b>Total</b>						<b>65,000</b>

## **11.0 DECOMMISSIONING**

### **11.1 Closure Procedures**

It is not anticipated that the infrastructure will be decommissioned, especially those in the Digya National Park, but in the event that they must be decommissioned, the Site Manager shall notify the Environmental Protection Agency, and the relevant Metropolitan, Municipal and District Assembly and other regulatory bodies of the intention to decommission.

For the water systems, the first phase of the decommissioning will involve the creation of a channel at the side of the dugout with the lowest gradient. This will allow the water in the dugouts to drain out. Then the embankments will be pushed into the dugout to fill it to the top at the level of the normal height. In case the embankment material is not enough, additional material including loam soil will be sought from elsewhere to complete the filling. Efforts shall be made to restore the land after closure to fit the neighbouring landscape of the site. For the other infrastructure, a detailed decommissioning plan will be prepared and submitted for approval before carrying out the works. Temporal campsites will also be removed to ensure that construction sites are kept clean without any obstacles that will impede movements.

### **11.2 Vegetative cover (Seeding)**

All the areas that have been covered with good loam soil, shall be seeded with indigenous plants or grassed. Seeding or grassing will normally be done just before the rainy season. Surface runoff control measures such as drainage ditches and culverts where appropriate will be constructed prior to seeding. All grading and covering will also be finalized prior to seeding. Raking, disking, or other acceptable means shall be used to loosen the top layer of soil before seeding.

### **11.3 Post Closure/After Care**

The sites will be monitored for a year to ensure that there is adequate vegetation cover to prevent erosion. It is also to ensure that there are no invasive species among the vegetation.

## 12.0 CONCLUSION

The goal of the six-year GLRSSMP-EPA PCU project is to strengthen integrated natural resource management and increase benefits to communities in targeted savannah and cocoa forest landscapes.

The project intends to undertake construction of a number of water systems (i.e., dugouts, water holes and boreholes), game viewing platform, toilet and cassava processing facilities in and around the Digya National Park. The construction of these infrastructure aims to improve access to water and watering of wild animals and livestock and contribute to the development of the Digya National Park as well as improve the livelihoods of fringe communities.

The proposed civil works in and around the Digya National Park will have both positive and negative environmental and social impacts and therefore an environmental and social assessment studies have been conducted in accordance with Government of Ghana precautionary principles and relevant World Bank Environmental and Social Standards culminating in the preparation of this Environmental and Social Impact Assessment (ESIA).

The proposed civil works in and around the Digya National Park is expected to generate potential positive impacts. The water systems in the park will improve the population of the wildlife through the provision of watering points at the peak of the dry season. The viewing platforms will help boost the tourism of capacity of the park and will also promote the sustainable management of natural resources and the processing facilities will enhance the livelihoods of local communities depending on these natural resources.

Impacts such as air quality deterioration, noise, occupational health and safety, waste generation etc. will be mostly associated with construction and operational phase activities thus the assessment showed that potential environmental and social impacts will be largely localised.

The analysis and surveys undertaken to prepare this Environmental and Social Impact Statement has adequately considered and addressed the above potential impacts. Further analysis has been conducted to determine the level of significance of the impacts. Feasible mitigation measures and appropriate management and enhancement measures as well as a comprehensive environmental and social monitoring plan have been developed. Proper facility siting, design, and operation, among other measures, can address and mitigate these potential negative impacts on the surrounding natural environment, the community and ensure sustainability. Appropriate mitigation

measures have been proposed and with the effective implementation of the ESMP, the residual impacts will be minimal.

## 13.0 REFERENCES

- Design for Waterholes
- Design for processing facilities  
Ghana Landscape Restoration and Small-Scale Mining Project (GLRSSMP) Environmental and Social Screening of selected Civil works, Screening Report Environmental Protection Agency (EPA) and the Ministry of Lands and Natural Resources (MLNR) May 2002
- International Bank for Reconstruction and Development and International Development Association Project Appraisal Document for Ghana Landscape Restoration and Small-Scale Mining Project August 10, 2021
- Environmental Protection Agency/Ministry of Environment Science Technology and Innovation, Ministry of Lands and Natural Resources Ghana Landscape Restoration and Small-Scale Mining Project (P171933) Environmental and Social Management Framework (ESMF), February 2021
- Environmental Protection Agency and Ministry of Lands and Natural Resources Ghana Landscape Restoration and Small-Scale Mining Project (P171933) Negotiated Environmental and Social Commitment Plan (ESCP), June 27, 2021
- Environmental Protection Agency (EPA) and the Ministry of Lands and Natural Resources (MLNR), Ghana Landscape Restoration and Small-Scale Mining Project (GLRSSMP) Project Implementation Manual (PIM), June 2021
- Ministry of Environment Science Technology and Innovation (MESTI), Ministry of Lands and Natural Resources (MLNR) Ghana Landscape Restoration and Small-Scale Mining Project (P171933), Draft Stakeholder Engagement Plan, March 2021
- Centre pour le Développement de la Production Faunique Wildlife Production Development Centre, Inception Report, 30 December 2023
- Centre pour le Développement de la Production Faunique Wildlife Production Development Centre, Site Evaluation and Summary Construction Plan, Community : Sakalo, Site: Sata Optimised Dugout, 31 January 2024
- Lovi Research Centre Drawings

## **14.0 ANNEXES**

Annex 1: Registration/Correspondence with EPA

Annex 2: Administrative Flow Chart of Environmental Assessment Procedure

Annex 3: Land Donation Memorandum Template

Annex 4: Architectural Drawings of proposed civil works

Annex 5: Outline of Contractor's C-ESMP

Annex 6: Evidence of Consultations

Annex 7: Grievance Redress Mechanism Forms



## Annex 1:

Table : Field Visit -Team B Members

No	Name	Designation	Organization	Tel No.
1	Anthony Appianti	PPO/ EPA, focal person - GLRSSMP	EPA-PCU	0207870262
2	Ivy Lomotey	APO/ Technical Officer - GLRSSMP	EPA-PCU	0261571868
3	Evelyn Gyampo	Environmentalist	EEMC	0200524450
4	Nana Amoateng-Dadzie	Social Development Scientist	EEMC	0591747484
5	Mike Arthur	Architect	EEMC	0246904555
5	Eric Atta Kusi	Park Manager	FC/WD/DNP	0546057019
6	Godfred Fobiri	Supervision	EEMC	0244488072
7	Prince Charles Asante	Manager	WD/FC	0248731126
8	Joseph Binlinla	Regional Manager	WD / FC	0244960685
9	Clark Lungren	Coordinator/Contractor	CDPF/WDPC	+22607105078
10	Patrick Akwara	APO	EPA - TCO	0244649873
11	Solomon Y. Beozuoya	APO	EPA- TCO	0246656297
12	Asher Nkegbe	Director/Head of TCO	EPA - TCO	0208294658

## Annex 2: Registration/ Correspondence with EPA

**ENVIRONMENTAL PROTECTION AGENCY**

RECEIVED  
16 JUN 2025

**ENVIRONMENTAL AGENCIES REGISTRATION BOARD**  
At the Regional Office

**REGISTRATION**

**NAME:** ENVIRONMENTAL PROTECTION AGENCY

**REGISTRATION NUMBER:** EP/REG/001/2025

**REGISTRATION DATE:** 16 JUN 2025

**REGISTRATION TYPE:** REGISTRATION OF AN AGENCY

**REGISTRATION CATEGORY:** PROJECT COORDINATOR

**REGISTRATION STATUS:** REGISTRATION SUCCESSFUL

The Regional Director is hereby notified that the above-named Agency has been registered as an Environmental Agency under the Environmental Protection Act, 1986 (Act 304) and is hereby granted a registration number of EP/REG/001/2025.

The Agency is hereby notified that the above-named Agency is hereby granted a registration number of EP/REG/001/2025.

**GUIDE FOR COMPLETION OF ENVIRONMENTAL IMPACT STATEMENT**

The Environmental Impact Statement (EIS) is a document that provides information on the potential impacts of a proposed project on the environment. It is a key component of the Environmental Impact Assessment (EIA) process. The EIS should be prepared for the proposed project and should include the following information:

**PROJECT**

1. Name of the project

2. Location of the project

3. Description of the project

4. Objectives of the project

**ENVIRONMENT**

1. Description of the environment

2. Description of the project area

3. Description of the project area

4. Description of the project area

**SERVICES**

1. Description of the services

2. Description of the services

**ENVIRONMENTAL IMPACT**

1. Description of the environmental impact

2. Description of the environmental impact

3. Description of the environmental impact

4. Description of the environmental impact

5. Description of the environmental impact

6. Description of the environmental impact

7. Description of the environmental impact

8. Description of the environmental impact

1. Description of the project

2. Description of the project

3. Description of the project

4. Description of the project

5. Description of the project

6. Description of the project

7. Description of the project

8. Description of the project

9. Description of the project

10. Description of the project

11. Description of the project

12. Description of the project

**ENVIRONMENTAL IMPACT STATEMENT**

1. Description of the environment

2. Description of the project area

3. Description of the project area

4. Description of the project area

5. Description of the project area

6. Description of the project area

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19. Description of the project area

20. Description of the project area

1. Description of the project

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27. Description of the project

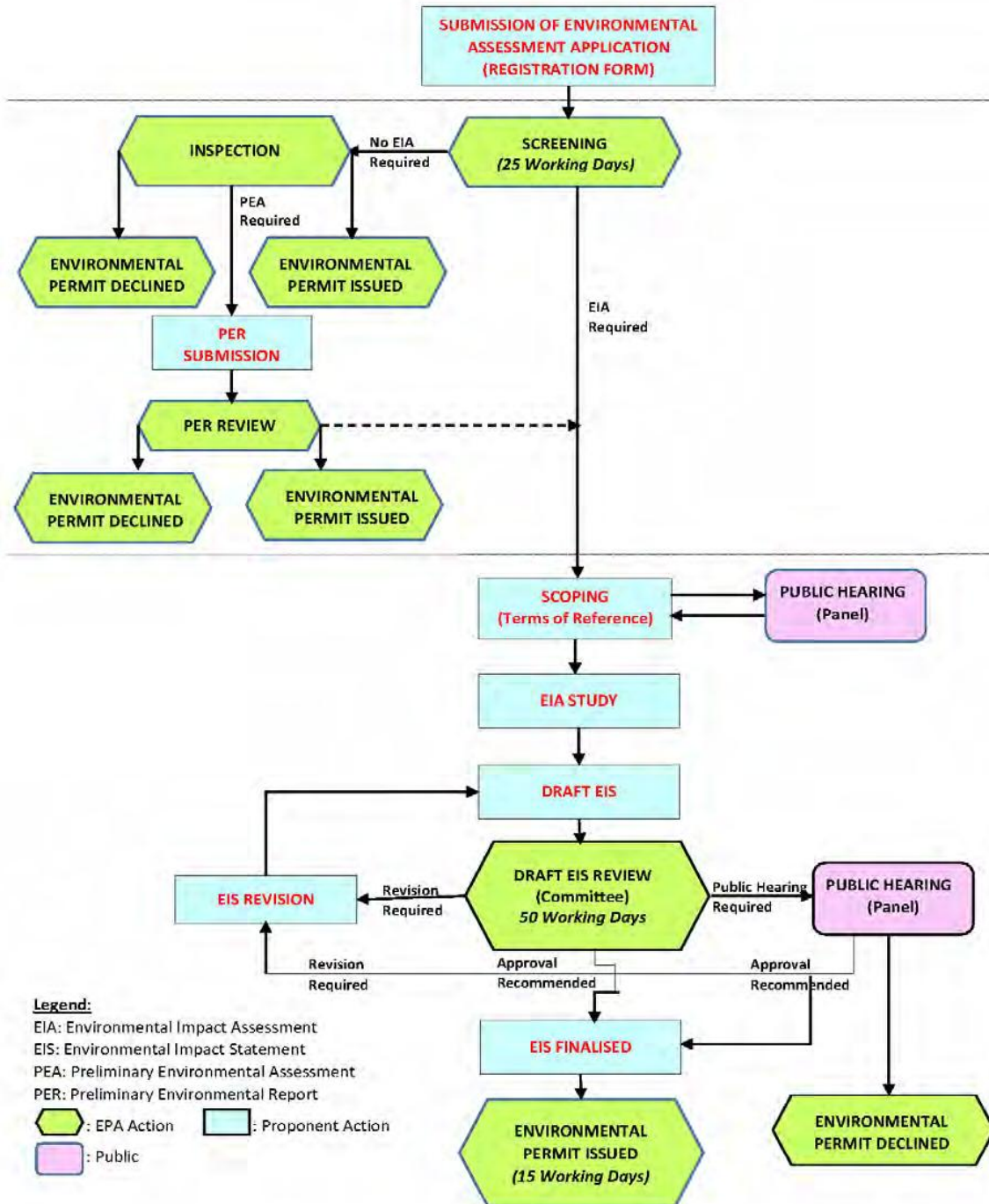
28. Description of the project

29. Description of the project

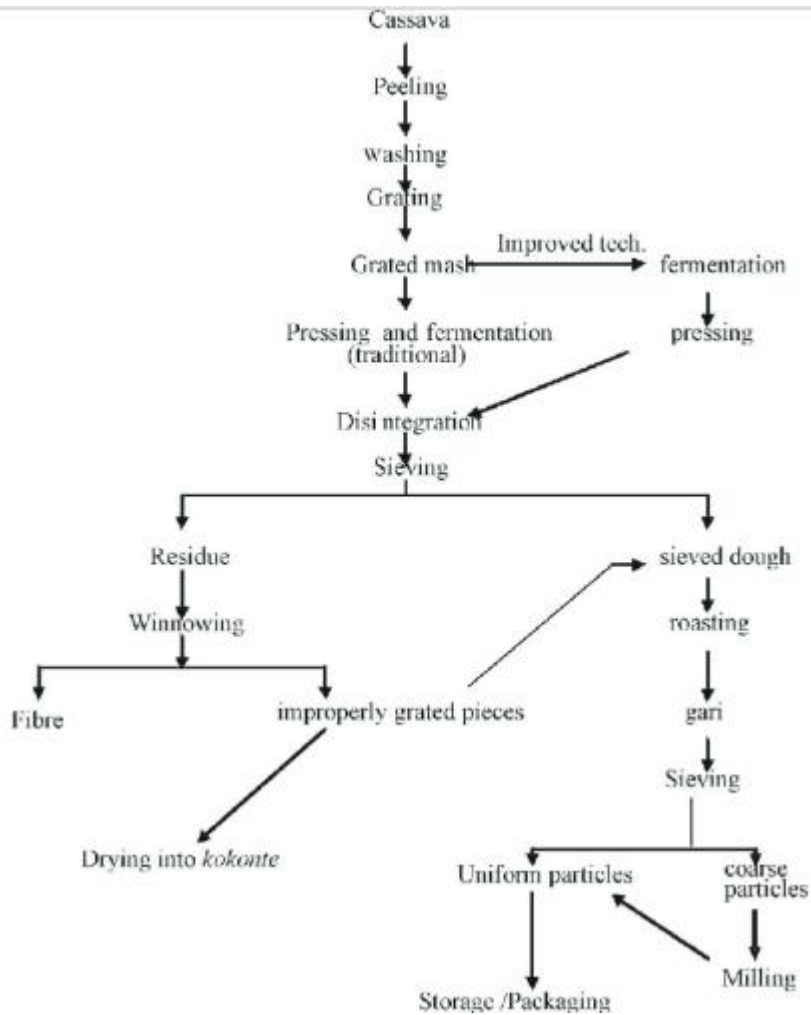
30. Description of the project



### Annex 3: Administrative Flow of the EA Procedure



### Annex 4: Chart for cassava processing into gari



**Annex 5: Land Donation Memorandum Template**

# **XXX COMMUNITY**

## **DEED OF GIFT**

**BETWEEN**

**XXX  
(DONOR)**

**AND**

**XXX  
(DONEE)**

**1.0 DEED OF GIFT**

This Deed of Gift (hereafter called the “**Agreement**”) made on this ..... day of ..... **20**..... is in respect of a parcel of land located in the **xxx community of the xxx Traditional Area in the xxx District of the xxx Region** of the Republic of Ghana between:

1.1 The **xxx** community acting per its lawful representative, **xxx**, hereafter called the “**Donor**”, and which expression shall where the context so requires or admits, include its agents, successors-in-title and assignees), with the consent and concurrence of the Principal Elders of the **xxx Traditional Area**, whose consent and concurrence is essential for the validity of this Agreement and which consent and concurrence are testified to by the execution of this Agreement) on one part;

and

1.2 The **xxx** hereafter called the “**Donee**”, which expression shall where the context so admits or requires include its agents, successors-in-title and assignees) on the other part.

Together referred to as “Parties” and individually as a “Party”.

## RECITALS

- A. **WHEREAS** **xxx** is one of many communities under the **xxx** Traditional Area.
- B. **WHEREAS** the Government of Ghana is implementing the World Bank-funded Ghana Landscape Restoration and Small-scale Mining Project (GLRSSMP) which has one of its core interventions focusing on strengthening the sustainable management of forest landscapes for biodiversity conservation and ecosystem services in targeted communities in the savannah and cocoa forest landscapes, including the **xxx** community.
- C. **WHEREAS** the Donee, as one of the implementing agencies of GLRSSMP, **is responsible for implementing sub-component activities of GLRSSMP involving the xxx**
- D. **WHEREAS** pursuant to implementing the said sub-component activities, it was agreed that **xxx** (hereafter referred to as the “**Project**”) will be established in the **xxx community**.

- E. **WHEREAS** the Donor is the Chief of xxx community, and the customarily recognised custodian of a parcel of land situate in the xxx community in the xxx Traditional Area in the xxx District in the xxx Region of Ghana, with an area of ----- acres (hereafter referred to as the “**Land**”), and more particularly described in the schedule hereto and delineated on the attached Site Plan.
- F. **WHEREAS** the Donor, in consultation with the x xx community people and elders, as well as the Principal Elders of the xxx Traditional Area, have voluntarily donated the Land in support of the Project.

NOW THEREFORE THE PARTIES AGREE AS FOLLOWS:

## 2.0 REPRESENTATIONS AND WARRANTIES

The **Donor** warrants that:

- 2.1 He has the capacity to enter into this Agreement on behalf of the xxx community;
- 2.2 The land being donated is a community land, and is free of all encumbrances and encroachment of any form or shape;
- 2.3 The decision to donate the Land was made in consultation with the xxx community people and elders, as well as the Principal Elders of the xxx Traditional Area;
- 2.4 The amount of land being donated is minor and will not reduce the xxx community's remaining land area below that required to maintain the community people's livelihoods at current levels;
- 2.5 He and the people of xxx community have been appropriately informed and consulted about the Project and its impacts, its land requirements, and its alternative activity sites, as well as rights to compensation for the Land if it were not donated.
- 2.6 He is aware that refusal to proceed with the donation of the Land is an option, and that execution of this Agreement is a testimony of their willingness to proceed with the donation;
- 2.7 No household has been relocated, or will be relocated as a direct or indirect result of the donation;

The **Donee** warrants that:



- 2.8 They have conducted the required due diligence, and confirm that the land being donated is free of all encumbrances and encroachment.
- 2.9 No household has been relocated, or will be relocated as a direct or indirect result of the donation;

### **3.0 COVENANTS OF THE DONOR**

- 3.1 To provide the Donee with the required consent and assist with, at the cost of the Donee, the registration of this Deed of Gift in the name of the Donee, at the Ghana Lands Commission.
- 3.2 To ensure that the Donee develops and operates the Project on the Land without interruption by the Donor or any persons acting on behalf of the Donor.

### **4.0 COVENANTS OF THE DONEE**

- 4.1 To use the Land solely for the development of the Project, as agreed by the Parties.
- 4.2 To conduct all Environmental and Social (E&S) risks and impacts assessments relevant to the Project, and design mitigation measures commensurate to the risks and impacts identified, in consultation with relevant stakeholders, including the Donor and members of the xxx community.
- 4.3 To secure all statutory permits, and comply with all legal requirements for the establishment and operation of the Project, from the Government agencies concerned.
- 4.4 Not to assign, sublet or otherwise part with possession of the Land or any part thereof.

### **5.0 THE PARTIES HEREIN AGREE that:**

- 5.1 Where the Donee determines that the Land is no longer needed for the intended purpose of the Project, the Donee shall, in consultation with the Lands Commission, return the Land to the Donor in a tenable state.
- 5.2 The Land, and all rights to it afforded to the Donee by virtue of the donation, shall automatically terminate and revert to the Donor, in the event that the Donee alters the agreed use of the Land without any prior consultation with, and written consent of the Donor.

- 5.3 Where the donation and this Agreement, by extension, terminate per **Clauses 5.1** and **5.2**, the Land shall revert to its original status as a **xxx** community land as was recognized prior to the donation.
- 5.4 If any covenant on either Party's part herein contained is not performed or observed, the other Party shall give to the defaulting Party reasonable notice in writing but not less than two (2) months ("**the Notice Period**") for the defaulting Party to make good the default. Should the defaulting Party fail to make good the default within the Notice Period, the other Party shall refer the issue to the Grievance Redress Mechanism (GRM) established under the GLRSSMP for redress, provided that the said GRM is still in force, or the agreed dispute resolution procedure under **Section 8.0** of this Agreement, where the said GRM is no longer in force.
- 5.5 Any notice required to be given by either Party hereunder shall be in writing and shall be considered validly given when delivered by hand or sent by prepaid post to either Party or to their last known physical address per **Section 6.0** of this Agreement.

**6.0 ADDRESSES OF THE PARTIES**

**Address of Donor**

**Nana Awuni Karim II**  
 P. O. Box.....  
 .....

**Address of Donee**

**Ministry of Food and Agriculture**  
**P.O. Box 14**  
**Ministries, Accra**

**7.0 VARIATION**

No variation or amendment of this Agreement or oral promise or commitment related to it shall be valid unless committed in writing and signed by or on behalf of the Parties.

**8.0 DISPUTE RESOLUTION**

Any dispute, controversy, claim or difference of opinion between the Parties or any issue arising out of or relating to this the donated Land shall be settled amicably within 30 days by the Parties. Where the dispute is not settled amicably within 30 days, the Parties agree to submit the dispute for final settlement by arbitration by a sole arbitrator. In the event that the Parties are unable to appoint a sole arbitrator within two (2) weeks of the decision to refer the matter to arbitration, the matter shall be referred to the Ghana Arbitration Centre for appointment of the arbitrator. Where a dispute is not arbitrable, the jurisdiction of the Courts of the Republic of Ghana shall be invoked for the settlement of such dispute by the aggrieved Party.

**9.0 GOVERNING LAW**

This Agreement, its interpretation, performance and the enforcement of the rights and remedies available to either Parties hereto shall be construed by and in accordance with the Laws of the Republic of Ghana.

**IN WITNESS WHEREOF** the Parties hereto have hereunto set their hands, names and common seal the day and year first above written.

After the contents herein have been read over, interpreted and explained to \_\_\_\_\_ them \_\_\_\_\_ respectively by.....

.....  
 ... of ..... (address and mobile number of interpreter) in the.....language and they each seemed perfectly to understand and approve of the same before making their marks respectively.

**SIGNED BY DONOR:**

XXX

Chief of xxx Community

Address: \_\_\_\_\_

Signature: \_\_\_\_\_

In the presence of (Donor's witnesses):

1. Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Address: \_\_\_\_\_

Signature: \_\_\_\_\_

2. Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Address: \_\_\_\_\_

Signature: \_\_\_\_\_

**SIGNED FOR AND ON BEHALF OF DONEE BY:**

Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Address: \_\_\_\_\_

Signature: \_\_\_\_\_

In the presence of (Donee's witnesses):

1. Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Address: \_\_\_\_\_

Signature: \_\_\_\_\_

2. Name: \_\_\_\_\_

Designation: \_\_\_\_\_

Address: \_\_\_\_\_

Signature: \_\_\_\_\_

**OATH OF RECORDING OFFICER**

The content of this Agreement has been fully read and explained to both Parties and their witnesses and they confirm that they clearly understood all the terms in this Agreement and all the essential features of the Agreement. Both Parties therefore signed this Agreement in my presence.

(signed)

.....

Date .....

**CERTIFICATE**

I, .....,  
 officer of the Customary Land Secretariat for the **xxx STOOL** in the **xxx** Region of Ghana, hereby certify that the above record of a transfer of an interest in land under customary law incorporates the essential features of the transaction sought to be effected.

.....

(name)

Officer of the **xxx** Customary Land Secretariat

Dated at..... this.....day  
 of..... , 20.....

**OATH OF PROOF**

I.....  
 ..... of ..... (*full name and address of deponent*), make Oath and say that on the ..... day of ..... 20....., I was present and saw the within-named DONOR duly execute the Instrument now produced to me and marked "A" and that the DONOR can read and write (*where a party cannot read and write, a jurat is required*)—:

SWORN AT ..... THIS.....DAY OF..... 20.....

DEPONENT (Witness of Donor)

BEFORE ME

.....  
 REGISTRAR OF LANDS

**CERTIFICATE OF PROOF**

On the ..... day of ..... 20..... at ..... o'clock in the ..... O'clock this instrument was proved before me by the Oath of the ..... within-named ..... to have duly executed by the within-named DONOR: -

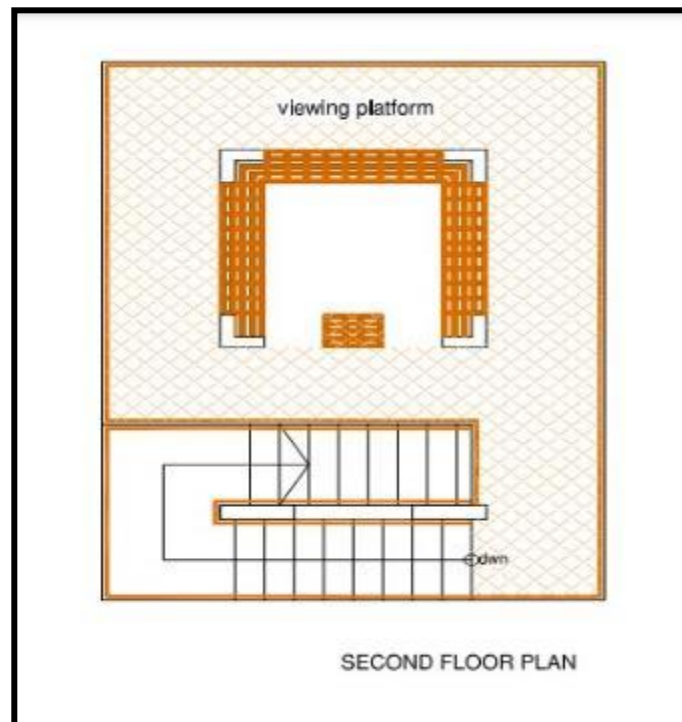
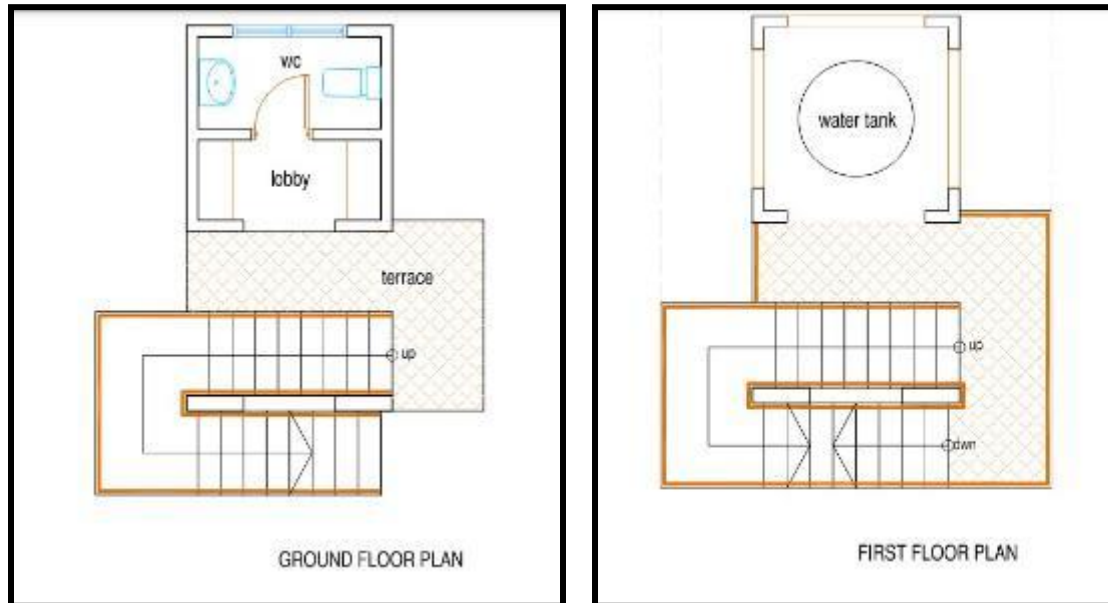
.....  
 REGISTRAR OF LANDS

**SCHEDULE**

DESCRIPTION OF LAND

SITE PLAN

**Annex 5: Architectural Drawings for the proposed civil works**

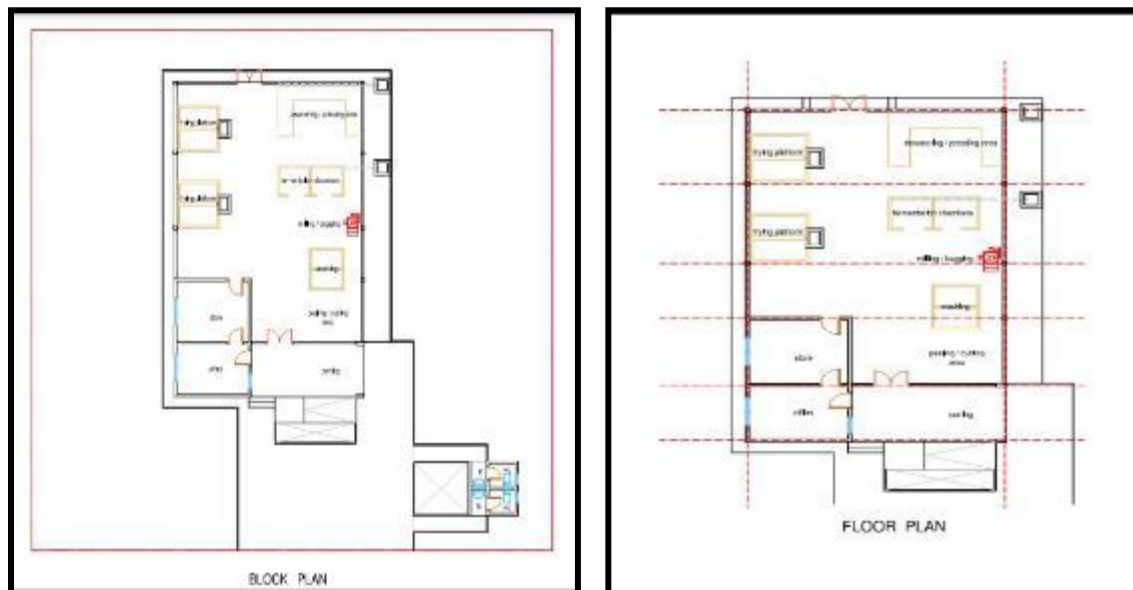


**Block Plan for a viewing plattform**



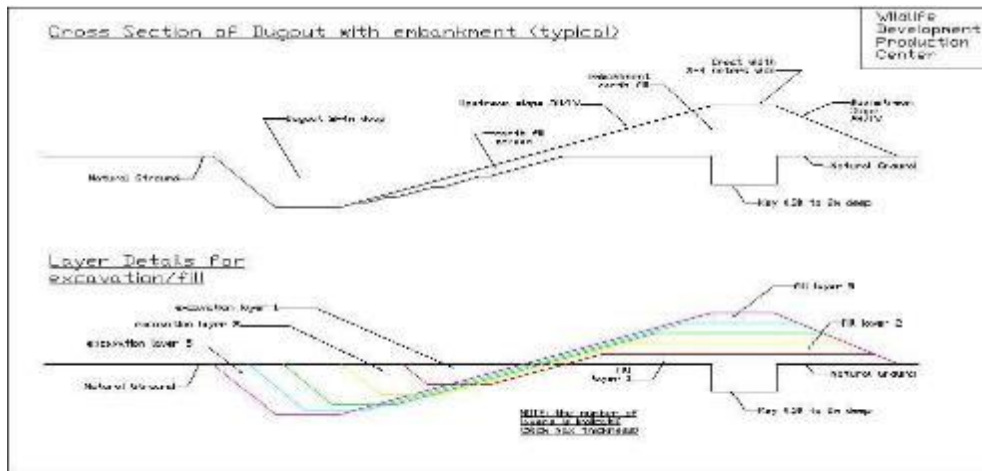


**3D Design of Viewing platform**



**Block plan of Mini Processing Facility**

### 3D Model of the Processing facility



**Design of Dugouts**

## Annex 6:

Table : Stakeholder Engagement Tools

District/Community / Facility	Engagement Tool/Approach				Key Consultees
	Interviews/Discussions			Town Hall Meeting	
	One-On-One discussions	Focus Group Discussions	Key Person Interviews		
<b>Sene West</b>					
Mini Cassava processing plant at Lassi community		√		√	<ul style="list-style-type: none"> <li>▪ Peter Yeboah- Assemblyman- 0542465507</li> <li>▪ Francis Gambo – Youth Leader- 0557289342</li> <li>▪ Philip Mensah- Youth committee chair</li> <li>▪ Kwame Dipa-Odikro</li> <li>▪ Faustina Agyeiwaa- CREMA committee treasurer</li> </ul>
<b>Sene East</b>					
Mini Cassava Processing facility at Deefour community			√		<ul style="list-style-type: none"> <li>▪ Eric Atta Kusi (Park Manager – Digya National Park - Wildlife Division of the Forestry Commission- 0546057019</li> </ul>
<b>Kwahu Afram Plains South</b>					
Mini Cassava Processing facility at Deefour community			√		<ul style="list-style-type: none"> <li>▪ Eric Atta Kusi (Park Manager – Digya National Park - Wildlife Division of the Forestry Commission- 0546057019</li> </ul>
<b>Sekyere Central</b>					
Dome Settlement (DNP) - Solar Powered Borehole Toilet Facility	√	√	√		<ul style="list-style-type: none"> <li>▪ Emmanuel Osei – Teacher- 0245152013</li> <li>▪ Kwame Attuah – Chief Priest - 0555724990</li> </ul>
Tato Camp (DNP) - Game Viewing Platform	√	√	√		Eric Atta Kusi (Park Manager – Digya National Park - Wildlife Division of the Forestry Commission- 0546057019

### Annex 7: Outline of Contractors' C-ESMP

Every contractor executing a civil work will prepare a Contractor's ESMP to be approved by the GLRSSMP-EPA PCU prior to the commencement of civil work works. The ESMP will be used for the implementation of the various environmental and social actions regarding the civil work works.

The following outline can be considered by the Contractor as a guide for preparation of the C-ESMP:

- Introduction
- Brief Description of the Civil work and Construction Activities
- Legal and Other Requirements
- Roles and Responsibilities
- Environmental and Social Management
- Health and Safety Management
- Community Liaison and Grievance Redress
- Compliance and Monitoring
- Incidents, Non-Conformance and Preventive Actions
- Reporting;
- Implementation Schedule and Cost Estimates, and
- Conclusion.

Table: Details of GLRSSMP-EPA PCU Sites Selected, Geographical Coordinates, Districts and Remarks

S/N	Site/Community	District	Proposed Civil works	Geographical Coordinates	
				Lat.	Long.
1	Dome Settlement (Digya National Park)	Sekyere Central	a)Solar Powered Borehole	7.556048	-0.626523
		Sekyere Central	b)Toilet facilities	7.555195	-0.626610
2	Agoam Saboso/Digya National Park	Sekyere Afram Plains	a)Solar Powered Borehole	7.367379	-0.746197
		Sekyere Afram Plains North	b)Toilet facilities	7.367555	-0.746018
5	Nsugyaso/Digya National Park	Kwahu Afram Plains South	Waterhole	7.184461	-0.511431
		Kwahu Afram Plains South	Viewing Platform	7.164691	-0.511598

**Annex 8: Evidence of Consultations**



Lasi –Sene West- Cassava Mini Processing Factory Site



Dome (DNP) – Borehole and Toilet Facility Site.

Crossing the Sene river to the DNP



Tato Camp (DNP) – Game Viewing Platform Site

Viewing and Inspection – Takorayili shea processing plant



Engagement with Digya National Park Management



Interactions with Dome settler community in the Digya National Park

## Annex 9: Grievance Redress Mechanism Complaint Submission Forms

<b>Reference No:</b>	
<b>Full Name:</b>	
<b>Contact information and preferred method of communication</b> Please mark how you wish to be contacted (mail, telephone, e-mail).	<b>By Post: Please provide postal address:</b> _____ _____ _____
	<b>By Telephone:</b> _____ <b>By E-mail</b> _____
<b>Nature of Grievance or Complaint</b>	
<b>Description of grievance:</b>	What happened? Where did it happen? Who was involved? What is the result of the problem? Source and duration of the problem?
<b>Date of incident/grievance</b>	<input type="checkbox"/> One-time incident/grievance (date _____) <input type="checkbox"/> Happened more than once (how many times? _____) <input type="checkbox"/> On-going (currently experiencing problem)
<b>Receiver</b>	<b>Name:</b> _____ <b>Signature</b> _____ <b>Date</b> _____
<b>Filer</b>	<b>Name:</b> _____ <b>Signature</b> _____ <b>Date</b> _____ <b>Relationship to Complainant (if different from Complainant):</b> _____ _____
Review/Resolution Level 1 (MDA) Level 2 (IA) Level 3 (PCU) Date of Conciliation Session: _____ Was Filer/Complainant Present? Yes/ No Was field verification of complaint conducted? Yes/ No Findings of field investigation _____ _____ _____	

\_\_\_\_\_

\_\_\_\_\_

Summary of Conciliation Session Discussion

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Issues

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Was agreement reached on the issues? Yes, No If agreement was reached, detail the agreement

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

If agreement was not reached, specify the points of disagreement

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

Signed (Conciliator): \_\_\_\_\_

Signed (Filer/Complainant): \_\_\_\_\_

Signed: \_\_\_\_\_

(Independent Observer e.g. Assembly Member/Opinion Leader)

Date: \_\_\_\_\_

**Implementation of Agreement**

Date of implementation: \_\_\_\_\_

Feedback from Filer/Complainant: Satisfied /Not Satisfied

If satisfied, sign off & date \_\_\_\_\_

(Filer/Complainant) (Mediator)

If not satisfied, recommendation/way forward

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

(Signature & date of Filer/Complainant) \_\_\_\_\_

(Signature & date of Mediator) \_\_\_\_\_

**Complaint Register**



