MINISTRY OF FOOD AND AGRICULTURE

SAVANNAH AGRICULTURE VALUE CHAIN DEVELOPMENT PROJECT (SADP)

BAWKU WEST DISTRICT

SUB-PROJECTS

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

FINAL REPORT

Prepared by:
SAL Consult Limited, P. O. Box GP20200, Accra, Ghana
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ACRONYMS AND ABBREVIATIONS

1D1F	One District One Factory
AEZ	Agro-Ecological Zones
AfDB	African Development Bank
CBD	Central Business District
CITES	Convention on International Trade in Endangered Species of Wild Fauna and Flora
DCP	Decommissioning and Site Closure Plan
DEMC	District Environmental Management Committees
EA	Environmental Assessment
EIS	Environmental Impact Statements
EPA	Environmental Protection Agency
ESIA	Environmental Impact Assessment
ESMP	Environmental and Social Management Plan
FAREC	Feed Africa Response to the Impact of COVID-19
FASDEP	Food and Agriculture Sector Development Policy
FAW	Fall Army Worm
FBGs	Farmer Based Groups
FBOs	Farmer Based Organizations
FID	Factories Inspectorate Division
GIDA	Ghana Irrigation Development Authority
GNFS	Ghana National Fire Service
GRC	Grievance Redress Committee
ICPM	Integrated Crop and Pest Management
MED	Metro Education Directorate
METASIP	Medium Term Agriculture Sector Investment Plan
MoFA	Ministry of Food and Agriculture
NADMO	National Disaster Management Organization
OSs	Operational Safeguards
PAPs	Project Affected Persons
PCR	Project Completion/Technical Review
PCU	Project Coordinating Unit
PFJ	Planting for Food and Jobs
PSC	Project Steering Committee
RCC	Regional Coordinating Council
RFJ	Rearing for Food and Jobs
SADP	Savanah Agriculture Value Chain Development Project
SAPIP	Savannah Zone Agriculture Productivity Improvement Project
SDHMT	Sub-district Health Management Team
SIP	Savannah Investment Programme
SPS	Sanitary and Phytosanitary
TAAT-s	Technologies for African Agricultural Transformation
UNFCCC	United Nations Framework Convention on Climate Change
WRC	Water Resources Commission

NON-TECHNICAL EXECUTIVE SUMMARY

0.1 OVERVIEW OF THE PROJECT

The Savannah Agriculture Value Chain Development Project (SADP) is being implemented by the Government of Ghana through the Ministry of Food and Agriculture to serve as part of post COVID-19 reconstruction efforts aimed at addressing disruptions in food systems in Ghana. It builds on earlier successes under the Savannah Zone Agriculture Productivity Improvement Project (SAPIP) and Savannah Investment Programme (SIP) that have so far expanded the production of maize and soybean from 80 hectares in 2018 to 14,000 hectares in 2021. This program is expected to build on the achievements made and to further expand production of rice, soybean and maize by additional 8,000 hectares by 2026. The SADP project, is being implemented in nine (9) different MMDAs across Ghana.

0.2 Objectives

The overall goal of the project is to increase production of livestock (particularly poultry meat), contribute to industrialization, youth employment and food security.

0.2.1 Specific Objectives

The project is expected to

- contribute to the Government's industrialization agenda, including One District One Factory (1D1F),
- support skills development and entrepreneurship for women and youth and build resilient food systems in the savannah areas of northern and middle belts of Ghana.
- facilitate private sector investment in value chains associated with meat production, improved productivity and production of feedstock made up of rice, maize, and soybean.

0.3 Components and main activities

No	Component Name	Sub-Component and Activities
1	**Production Development**	**<u>Sub-component 1.1 Commercial Production of Maize and Soybean under Conservation Agriculture</u>** • Production and promotion of certified hybrid maize and improved soybean seeds, in collaboration with seed companies. • Support to land development and mechanisation services. • Training of producers, haulers, aggregators and marketers on sanitary and phytosanitary (SPS) issue relating to maize and soybeans • Farmer mobilisation and awareness creation on conservation agriculture. • Train project staff and farmers on Integrated Crop and Pest Management (ICPM), including biological control options for the management of Fall Army Worm (FAW) and aspergillus on Maize and Soybeans. • Conduct surveillance and collect data on pests attacking the Maize and Soybeans in the project zones with specific reference to FAW. • Support out-grower contractual arrangements • Use of ICT for soil suitability assessment and GIS mapping of commercial farms • Promotion of climate smart agriculture, environmental conservation best practices, including use of economic trees such as shea, dawadawa, mango, cashew etc • Community sensitization, Establishment of fire belts and enforcement of community fire by-laws to deal with the impact of bush fires.

No	Component Name	Sub-Component and Activities
		• Promote the use of Nitrogen fixing inoculants to boost soybean yield
		Sub-component 1.2 Promotion of Small and Medium Scale Commercial Poultry Production • Input support to small and medium scale commercial poultry farmers (poultry cages, day old chicks, feed stock, vaccines, veterinary drugs, etc) • Supply of local chicken to vulnerable households, especially women headed households • Support to poultry diseases surveillance, diagnosis and control • Training and capacity building on business development, animal husbandry and health • Support to hatchery expansion, including parent stock for broilers, guinea fowls and local chicken
2	**Agribusiness and Value Chain Development**	**Sub-component 2.1 Value Addition and SME Development** • Promotion of quality standards for rice, maize and soybean production, storage and processing • Support business development, including improvements in business processes of existing commercial farmers • Enhance access to market information (e.g. quantity, quality, timing and pricing) • Promote the development of allied services (packaging, new distribution networks for poultry products, transport services, new agro-input delivery systems, etc) • Support and training of poultry producers on ISO 9000 & other necessary certification requirements on poultry to access premium market. • Support to feed millers to improve feed stock and expand processing capacity • Enhance investment facilitation and promotion to increase the number of commercial producers and processors in the Savannah regions • Support for cold chain development for chicken
		Sub-component 2.2 Youth/Women Empowerment and Nutrition • Promote other income generating activities for women and youth, including shea, dawadawa, mango, cashew production and processing • Support women and youth on marketing and supply of poultry products to key institutions and programs including the school feeding program • Capacity building for women and youth in small-scale commercial poultry business management and entrepreneurship, including mentorship. • Promote the consumption of local poultry and eggs to improve household nutrition, and in particular maternal and child nutrition to prevent stunting • Promote the breed improvement of local poultry through cockerel distribution program
3	Project Management and Institutional Support	**Sub-Component 3.1 Knowledge Management, Monitoring and Evaluation** • Development of annual work plan and budget • Establishment of results-based management system for M&E • Conduct Beneficiary Impact Assessment. • Conduct Project Mid-Term Review. • Conduct Project Completion/Technical Review (PCR). • Video and pictorial documentation of success stories • Undertake relevant studies, including socio-economic surveys, soil suitability surveys • Development and Implementation of Environmental and Social Management Plan (ESMP) • Enhance capacity to mobilize private sector investors in the maize-soybean-poultry industry
		Sub-component 3.2 Project Coordination. • Upgrade the project coordination unit with additional staff • Procure vehicles for PCU, office equipment and furniture as may be required. • Facilitate annual financial audits. • Facilitate procurement audit. • Facilitate Project Steering Committee (PSC) meetings.

0.4 Project Activities in the Bawku West District

The specific project activities to be implemented in the Bawku West District at the preparatory, construction and operation phases of the project implementation are:

0.4.1 Preparatory Phase

- Identification of potential beneficiary communities for the production of maize, soybeans and rice
- Conduct of relevant studies, including socio-economic surveys
- Development and Implementation of Environmental and Social Management Plan (ESMP)
- Request for applications and screening of applicant farmers Assessment of soil suitability and GIS mapping of commercial farms using ICT.

0.4.2 Construction Phase

- Provision of support for land development and access to mechanisation services.
- Production and promotion of certified hybrid maize and improved soybean seeds, in collaboration with seed companies.
- Promotion of climate smart agriculture, environmental conservation best practices, including use of economic trees such as shea, dawadawa, mango, cashew etc.
- Training and capacity building on business development, animal husbandry and health
- Enhance capacity to mobilize private sector investors in the maize-soybean-poultry industry

0.4.3 Operation Phase

- Support out-grower contractual arrangements
- Conduct surveillance and collect data on pests attacking the Maize and Soybeans in the project zones with specific reference to FAW.
- Community sensitization, Establishment of fire belts and enforcement of community fire by-laws to deal with the impact of bush fires.
- Promote the use of Nitrogen fixing inoculants to boost soybean yield
- Promotion of quality standards for rice, maize and soybean production, storage and processing
- Support business development, including improvements in business processes of existing commercial farmers
- Enhance access to market information (e.g. quantity, quality, timing and pricing)
- Promote the development of allied services (packaging, new distribution networks for poultry products, transport services, new agro-input delivery systems, etc.)
- Support to feed millers to improve feed stock and expand processing capacity
- Enhance investment facilitation and promotion to increase the number of commercial producers and processors in the Savannah regions
- Promote other income generating activities for women and youth, including shea, dawadawa, mango, cashew production and processing
- Support women and youth on marketing and supply of poultry products to key institutions and programs including the school feeding program
- Capacity building for women and youth in small-scale commercial poultry business management and entrepreneurship, including mentorship.

0.5 Institutional and legal framework for implementation of the project

0.5.1 Roles and responsibilities of the project implementation entity (PIE)

- Responsible for project implementation in general.
- Have the overall responsibility to ensure that the project implements the construction phase management and monitoring requirements provided in the ESMP.
- Responsible for grievance redress procedure and its functioning and effectiveness of other litigation avoidance measures.

- Oversee sensitization and awareness programmes.
- Grievance Redress

0.5.2 Implementing agencies and other stakeholders for the implementation of the ESMP

Ministry of Food and Agriculture

- Project planning and design
- Payment of compensations to PAPs, if any
- Management of contract award
- Compliance monitoring
- Grievance redress

Environmental Protection Agency

- Issuing of environmental permit upon review and approval of ESIA
- Adhoc monitoring of the sub project to ensure compliance with conditions of the Environmental Permit.

Bawku West District Assembly

- Adhoc monitoring of project during the construction phase
- Monitoring facilities during the operational phase of the project to ensure that it is working properly and help resolve operational phase challenges
- Grievance Redress

Project Consultant and Safeguards Specialist

- Ensure that project execution meets specified environmental, social, health and safety guidelines contained in the contract documents and ESMP
- Issue site instructions to Contractors to ensure environmental and social mitigation measures are implemented by contractors
- Grievance Redress

Works Contractors/Sub Contractors

- Contractors for the civil works will be responsible for construction and installations under the project according to project specifications and designs.
- Contractors are responsible for reinstatement of all damaged properties.
- Contractors are responsible for implementation of the construction phase mitigation measures provided in the ESMP
- Responsible for presentation of monthly monitoring report to the PCU
- Responsible for remedying defects committed during construction

Grievance Redress Committee

- To receive and find solutions to grievances

0.5.3 Legislative and regulatory requirements for the implementation of the ESMP

The relevant legal and institutional frameworks include:

Policies and Plans

- Ghana Shared Growth and Development Agenda, 2010;
- National Environmental Policy, 2012;
- National Land Policy, 1999;
- National Water Policy, June 2007;
- National Climate Change Policy, 2013;
- National Gender Policy, 2015;
- Riparian Buffer Zone Policy, 2014;
- National Irrigation Policy, June 2010;
- Food and Agriculture Sector Development Policy, FASDEPII (MOFA);
- National Environmental Action Plan/Policy, 1994; and
- National Employment Policy, 2012

National legal framework

- The Constitution of the Republic of Ghana, 1992;
- Ghana Investment Promotion Centre Act 1994, Act 478;
- Environmental Protection Agency Act 1994, Act 490;
- Environmental Assessment Regulations 1999, LI 1652
- Fees and Charges (Amendment) Instrument, 2019 (LI 2386);
- Water Resources Commission Act 1996, Act 522;
- The Water Use Regulations 2001, LI 1692;
- Ghana Meteorological Agency Act 2004, Act 687

Agriculture sector legislation and related requirements

- The Irrigation Development Authority Regulations, 1987 (L.I. 1350)
- Irrigation Development Authority (Irrigation Water Users Association) regulations, 2016 (LI 2230);
- Plants and Fertilizer Act 2010 (Act 803)

Local governance, planning and other institutional requirements

- Local Governance Act, 2016 (Act 936);
- National Building Regulations, 1996 (LI 1630);
- The State Lands Act, 1962 (Act 125);
- Lands Commission (LC) Act 2008, Act 767;
- Land Use and Spatial Planning Act, 2016 (Act 925)

Labour, Health, Safety, Security and Social Protection

- Labour Act, 2003 (Act 651);
- Occupational Safety and Health Policy of Ghana (Draft, 2004);
- Workmen's Compensation Law, 1987 (PNDCL 187);
- National Workplace HIV/AIDS Policy

Environmental regulations

- Ghana Standard for Environmental Protection - Requirements for Effluent Discharge (GS1212, 2019);
- Ghana Standards for Environment and Health Protection - Requirements for Ambient Air Quality and Point Source/Stack Emissions (GS 1236, 2019);
- Ghana Standards for Health Protection - Requirements for Ambient Noise Control (GS 1222, 2018);
- Ghana Standards for Environment and Health Protection - Requirements for Motor Vehicle Emissions (GS1219, 2018);
- Factories, Offices and Shops Act, 1970 (Act 328);
- Water Resources Commission (WRC) Act 1996, Act 522;
- Ghana National Fire Service Act, 1997 (Act 537);
- Fire Precaution (Premises) Regulations, 2003 (LI1724).

0.6 Environmental and Social Baseline Conditions

0.6.1 Project location in Bawku West District

The Bawku West District is located in the eastern corridor of the Northern Region of the Republic of Ghana between Latitude $9^0 – 35^0$ North and $0^0 – 30^0$ West and $0^0 – 15^0$ East. The district covers an area of 2714.1 sq.km. and shares boundaries with Yendi Municipal to the East, Tamale Metropolitan and Savelugu Municipal to the West, Gushegu and Karaga to the North and Nanumba North and East Gonja to the South. The distance from the district capital Sang, to the regional capital, Tamale is about 63km.

0.6.2 Direct influence area

The immediate geographical area of influence of the project will be beneficiary communities, which have been identified based on the availability of vast land for commercial farming. Considering that the environmental and social characteristics are largely homogeneous, broader reference is made to information on the Bawku West District, where the project communities are located.

0.6.3 Indirect influence area: Bawku West District

The entire Bawku West District is largely the indirect influence area as all the beneficiary communities fall administratively under Bawku West District Assembly.

0.7 Environmental baseline conditions and major environmental stakes/challenges

0.7.1 Physical Environment

The district has a generally gently undulating landform, broken in some places by hills or ranges formed either by outcrops of resistant Birimian rocks or of granite intrusions. About 75% of the district lies between 183m to 244m above sea level. Parts of the northern fringes of the district are between 244m to 305m with few isolated hills exceeding 305m above sea level. The area is drained by the

White Volta with its major tributaries including the Red Volta, the Nauho River and other minor tributaries such as Gbere, Kpalsako, Sitande, Biringu, Lamboya, Tilli, Zongoire, Farik, Widnaba, Gundago, Yarigu, Kpantarigu.

The district is underlain by formations of Voltaian sandstones. Although the Voltaian rocks have similar relief characteristics as those over granite and phyllites, they are marked by small escarpments, examples of which can be seen at Zongoyiri. These rise to 100 – 150ft (33m to 50m) above the White Volta. There are other rocks located in the Tilli – Widnaba area and Teshie – Soogo – Sapelliga area to the North. In the Eastern section of the district are found the Boya-Kpalsako hills.

The soils here have been generally developed over the granitic rocks and over basic rocks mostly of the Birimian, Tanchera series, Kolingu series and the Mogo constitution. The Tanchera and Kolingu series cover about two-third of the district and are developed over granite rocks. Soils of this nature have topsoils of varying texture. However, soils developed over basic rocks and most of the valley bottoms have heavier topsoils and subsoils. The soils of the Tanchera association are loose, porous, coarse texture and easy to cultivate. It has low moisture retention due to the sandy nature. Internal drainage is relatively excessive while external drainage is low.

The Kolingu soil series also found in the district has low moisture retention. Rainwater filtering is very easy and therefore prone to the effects of drought because the water moves laterally down slopes to valley bottoms. Apart from the aforementioned soil types, there are Nangodi Association developed from Birimian rocks and occupies the Northern – most portion of the District and the Kintampo Association developed over Voltaian rocks occupying the southern – most portion of the district bordering the White Volta.

The movement of two oscillating air masses; namely the harmattan and the monsoon, influences the climate of the area. The harmattan air mass, which blows from a north-easterly direction across its area, originates from the Sahara, reaching its maximum southward extend into January. This period is characterized by dry and dusty conditions. The Monsoon air mass, which blows from South to North, passes over the area reaching its maximum northward extend into August and September and is characterized by warm, humid and wet conditions.

The district experiences a unimodal rainfall regime lasting 4 to 6 months and a long dry period of 6 to 8 months in a year. The average annual rainfall, temperature and relative humidity are 956mm, 34^{o}C and 56% respectively, with potential evapotranspiration of more than 2882mm. There is therefore excessive evapotranspiration over rainfall.

0.7.2 Biological Environment

The district's vegetation is Sudan Savanna consisting of short drought and fire-resistant deciduous trees interspersed with open savanna grassland. Grass is very sparse and in most areas the land is bare and severely eroded. Common grasses include Andropogan gayanus (Northern Gamber Grass) in the less eroded areas and Hyparhenia spp, Aristida spp, and Heteropogon spp. (Spear grass) in the severely eroded areas. Common trees include Anogeissus spp, Acacia spp (Thorn tree) and Triplochiton spp. Economic trees include Parkia filicoidea (Dawadawa), Butyrospermum parkii (Sheanut), Andansonia digitata (Baobab) and Ceiba pentandra (Kapok).

In most cases the vegetation is highly degraded by land clearing for farming, fuel wood harvesting, overgrazing, annual bushfires and harvesting of poles for construction. The activities of illegal miners are also contributing to the degradation of the vegetation in some parts of the district (Teshie, Widnaba, Zongire, Zebilla, etc.) as most of these illegal activities take place on agricultural lands, and this therefore has serious implications on soil fertility for sustainable crop production.

Another phenomenon that has recently started occurring is the felling of Dalbergia nigra commomly known as rosewood. This phenomenon occurs in areas like Zongoiri, Binaba, Kusanaba and Tilli where the trees are cut and carted out of the district for export.

The sparsely inhabited Oncho-freed woodland and forest belt and the uninhabited forest reserve along the eastern and southern portions of the Red and White Volta, stretching from Widnaba-Tilli area in the District through Binaba-Kusanaba and Zongoiri to East Mamprusi, is a favourable abode of a variety of animals including elephants. This forest belt (Eastern Wildlife Corridor) is the natural route for elephants moving to and from Burkina Faso. The forest belt with its rich flora and fauna presents an ecotourism potential in the district. However, the wild animal resources are severely depleted, and their habitats continue to be under siege from various economic activities including land clearing for agriculture, indiscriminate bush burning, hunting for bush meat, logging and mining.

0.7.3 Social baseline conditions and major social stakes/challenges

The Bawku West District Assembly is the highest administrative, political and planning authority in the district, which is charged with the responsibility of formulating and implementing development plans, programmes and projects. The District Assembly has a policy making body, the General Assembly made up of 49 Assembly members of which 34 are elected and 15 are appointed by the President of the Republic of Ghana. The Assembly has sub-committees through which the Executive Committee operates.

In the traditional set up the Bawku West District is under the Bawku paramountcy of the Bawku Traditional Area. There are ten (10) divisional chiefs in the district and these include the Zebilla Naaba, Teshie Naaba, Binaba Naaba, Zongoire Naaba, Kusanaba Naaba, Tilli Naaba, Widnaba Naaba, Sapelliga Naaba, Tanga Naaba and Timonde Naaba.

The district population is 144,189 made up of 70,781 (49.1%) males and 73,408 (50.9%) females. This is about 11.1% and 0.47% of the regional and national population respectively. The district has 21,731(15.1%) of its population located in urban areas with 122,458 (84.9%) of the population located in rural settlements. The population density is 131.5 persons per sqkm with a total of 26,877 households and an average household size of 5.3 persons per household which is higher than the regional average of 4.8. The dominant types of housing within the district are mud structures roofed with thatch with the thatch giving way to zinc roofing sheets. The average occupancy ratio is between 5 to 9 persons and sanitary conditions are generally poor.

The Kusasis are the predominant ethnic group. Other ethnic groups in the district are the Frafras, Kasenas, Mamprusis, Moshies, Busangas, Akans and Fulanis. There are also Ewes who are settler fishermen along the White Volta at Zongoiri. The African Traditional Religion is the predominant religion with 44.0% of the population, followed by Christianity (35.0%) and then Islam (18.0%). Only a

small proportion of the population either adhere to other religions (1.0%) or are not affiliated to any religion (2.0%).

Agriculture is the dominant occupation in the district. The majority (86.5%) of males find themselves in agriculture compared to 76.4% of females in the same sector. Other livelihood activities include charcoal burning, harvesting and sale of fuel wood, grass cutting, hunting, trading, pottery, weaving, carpentry and joinery, fitting, blacksmithing, hairdressing, dressmaking, drinking, and chop bar keeping, distribution of petroleum products, sale of building materials and telecommunication services.

The available industries include groundnut oil processing, shea butter extraction, dawadawa and malt processing, rice parboiling and milling and weaving of smock materials which are done using simple local technology. The major marketing centres in the district include Zebilla, Binaba, Sapelliga, Gbantongo (Kukore) and Agatusi. Others include Tanga, Timonde and Widnaba markets. The main items traded in these markets are maize, rice, millet, beans, sorghum, and groundnuts. Other items are malt, dawadawa, onions and livestock.

The main road transport service provider in the district is the Ghana Private Road Transport Union (GPRTU) of the Trades Union Congress (TUC), which provides bus services to mainly Kumasi, and to a few villages especially during market days. Majority of locals depend on bicycles, motorcycles and donkey carts (used for carting goods) owned by individuals while others commute on foot from one place to another. Another new means of transport that recently sprung up is the motor tricycle popularly known as “Motor King” and “Mahama Can Do”

There are two common types of land ownership, and these are family ownership and clan ownership. No individual per se has complete right of title to land. On the other hand, individuals can claim ownership of a land as they have right to the temporal usage.

There are chiefs and ‘tindaanas (tindaanama)’, the heads of clans or lineages of aboriginal descent, in every community. People with these two titles in the communities wield considerable power and authority over their people. While the chiefs are the traditional political heads in the communities, the tindaanas are the main custodians of the land from ancestral traditions (ritual ownership) and hold in trust for the people.

The tindaana allocates use of unclaimed land within his area of jurisdiction and is entitled to ritual, not economic gifts of first fruits. He claims the right of reversion and totally abandoned land reverts to him for reallocation. Farmland, especially for the compound farm, is vested in the head of the compound by right of seniority. However, land acquired by a man’s own efforts in clearing and cultivating bush land remains his individual property while he lives and is inherited by his sons.

In keeping with the strong patrilineal nature of the kingship system, land is allocated only to men as females have no right to usufruct. However, women can obtain access to land for farming mainly through their social relations with male members of the community.

0.8 Major and moderate impacts and Mitigation

0.8.1 Preparatory Phase Negative Impacts

Land related disputes

The project communities are largely rural communities with vast land hence land take is not expected to generate major disputes. However, some farmers or individuals to be considered for project support may hurriedly acquire lands without following due process. This could result in ownership being contested especially if there is an ongoing land dispute resulting in a protracted dispute that could have some security implications.

Ownership of land should be made a requirement for qualification as a project beneficiary and evidence of ownership should be produced and documented. For lands without deeds, family or community consent should be obtained and documented before project is implemented.

Restricted access to pastures

Rearing of animals is a key economic activity in the project communities and animals such as cattle, sheep, and goat graze on surrounding vegetated lands. However, project activities such as land clearing and levelling could restrict locals access to lands that were otherwise used as pasture areas. Considering that there are vast adjoining uncultivated lands, herdsmen can still lead their animals to graze at other areas. The impact is therefore local, and the displacement will be temporary as alternative sites exist making this impact moderately significant.

Identification and proposal of alternative pasture areas to locals who otherwise used the project site as pasture area will help reduce the impact of restricted access. Furthermore, locals and herdsmen can be provided with some financial and technical support to acquire a sustainable source of feed for their livestock.

Destruction of vegetation and displacement of wildlife

Site clearing for soil suitability assessments and land preparation will lead to the destruction of some common vegetation, mostly shrubs and grasses, and a few trees. As required by the project, beneficiary farmers must own vast lands (>100 ha) and clearing of such vast areas could adversely affect vegetation including economic trees like shea and dawadawa. Habitats of common soil organisms such as dung beetle and earthworms will also be destroyed. However, the area, especially in the dry season, has very sparse vegetation and little fauna hence impact on vegetation will only be moderate.

To mitigate the impact of vegetation loss from clearing, only area required for project be cleared. Vegetation clearing should be carried out in the dry season, just before the rainy season, when very few plants will be affected. Economic trees such as dawadawa and shea should be avoided during clearing, if possible. Stray animals that are observed at or around project sites should be given safe passage to nearby bush and not killed. Hunting and or killing of wildlife/animals in bushes around project site by construction/other workers should be prohibited and made punishable.

0.8.2 Construction and Operation Phase Negative Impacts

Soil degradation

Construction

Land preparation, and excavation for foundation of structures such as sheds and warehouses could lead to soil erosion and creation of gullies through runoff especially in the rainy season and potentially loading of nearby waterbodies. Also, oil spillages from the maintenance of construction equipment and vehicles could contaminate soils and affect flora and soil fauna including dung beetles and earthworms. As there are vast adjoining lands, excavated spoils from land levelling could be pushed into other tracts of land creating unsightly scenes. The impact is largely localized, persistent and of average severity hence it is considered moderate.

However, with measures such as reinstatement of excavated areas, maintenance of vehicles, machines and fuel refilling at a designated area, contamination of soil can be avoided. Fuel storage and refilling sites should be kept away from drains and important water bodies. All spoils shall be disposed of as desired, and the site shall be fully cleaned before handing over. These measures are expected to minimize the impact on soil.

Operation

Leaving farmlands bare especially after harvesting could expose the soil to wind erosion from the strong winds in the dry season. Leaked or spilled oils from maintenance/operation of equipment and vehicles could contaminate soil and adversely affect soil fauna. Also, contaminated soil could be washed into nearby waterbodies via runoff. However, this impact is localized and of average severity hence considered moderate in significance.

Farmlands should be kept always vegetated to prevent sheet erosion from strong winds. An area should be designated for maintenance of vehicles and spill kits provided for accidental spillages.

Air Pollution

Construction

Land preparation and transport of materials on untarred roads will generate dust. Also, vehicular exhaust fumes will be emitted by poorly maintained vehicles and construction equipment. The dust and fumes could adversely affect air quality, especially in the dry season.

The impact on air quality is likely to be considerable especially when particulate matter is carried over some distance by winds like the harmattan winds that characterize the climate of the project area. However, any possible impacts will be temporary hence the significance will be moderate.

Construction vehicles and equipment should be maintained regularly to reduce their emissions and engine idling should be discouraged. Water should be sprinkled on cleared areas and all areas that have loose soil and the potential for dust pollution to suppress dust.

Operation

At the operation stage, fumes and dust generated by equipment and vehicles could reduce the quality of air in beneficiary, neighbouring communities, and communities along haulage routes. Sensitive

receptors such as persons with allergies and upper respiratory tract diseases could experience aggravation of their condition. This impact is temporary but could be regional in extent and considered moderate.

Mitigation measures include regular maintenance of equipment and vehicles, discouraging engine idling and institution of speed limits for drivers.

Water Pollution

Construction

Disposal of domestic waste from construction workers and food vendors and deposition of sediment, waste oil, fertilizer, and pesticides via runoff into nearby water bodies will reduce the quality of water and could also smother some fishes and benthic organisms. Waterbodies and water sources that serve the area, including the White Volta, Gbere, Kpalsako, Sitande, Biringu, Lamboya, Tilli, Zongoire, Farik, Widnaba, Gundago, Yarigu, Kpantarigu are just about 0.5km to 2.0km away from project communities. These waterbodies could be the direct recipient or indirect recipient of pollutants from farms. The impact severity is average, it is localized and temporary hence considered moderate in significance.

A waste management plan should be developed by the contractor to segregate, collect, and dispose of waste to prevent indiscriminate disposal of waste. Maintenance of equipment and vehicle should be done at designated areas with spill kits and drip trays provided to manage spillages.

Operation

Domestic wastes, poultry waste, workforce sewage/effluent, as well as runoff from cultivated land (containing fertilizers, pesticides, and herbicides etc.) could pollute surface water. Nutrient loading from fertilizers could lead to eutrophication and reduce the water quality making it unsuitable for use.

Wastes should be segregated in designated waste bins and collected regularly by a licensed waste collector. Disposal of wastes near water bodies should be avoided. prepare an Integrated Pest/Vector Management Framework/Plan to address the impacts on receptors such as waterbodies, beneficiary organisms, humans and animals, insects, fishes, etc. from the expanded use of agrochemicals, including inorganic fertilizers for growth improvement and pesticides against the spread of pests and diseases.

Noise and Vibration

Construction

Operation of construction equipment, movement of haulage vehicles and tooting of horns. Construction activities are anticipated to produce noise levels in the range of 80 - 95 dB (A). The construction equipment will have high noise levels, which can affect the personnel operating the machines as well as the residents within the project community or nearby communities.

Use of proper Personal Protective Equipment (PPE) such as earmuffs will mitigate any adverse impact of the noise generated by such equipment on workers. Equipment and vehicles will be maintained regularly to reduce noise levels. Also, construction activities will not be carried out during the night to reduce the impact of noise on residents and other sensitive receptors.

Operation

Noise and vibration from operation of processing equipment, equipment maintenance, movement of haulage vehicles, tooting of horns and noise from the poultry birds could be a nuisance to persons within the project community or nearby communities.

Waste generation and inefficient management

Construction

Clearance of vegetation and levelling of land at project site will generate vegetative waste and excavated spoil. Other wastes such as construction debris, pieces of steel/metal, packaging materials, plastic pieces, human waste, etc. if not disposed properly could clog drains, produce foul smell and facilitate the outbreak of sanitary related diseases such as cholera. The impact is local, temporary and of a high intensity hence considered major in significance.

A waste management plan should be developed by the contractor to segregate, collect and dispose of waste to prevent indiscriminate disposal of waste. Segregation of waste such as domestic i.e., food packaging and hazardous waste, i.e., containers of pesticides and herbicides should be practiced, and waste collected by licensed waste collectors Maintenance of equipment and vehicle should be done at designated areas with spill kits and drip trays provided to manage spillages.

Operation

Improper disposal of vegetative waste from weeding, harvests, domestic waste from workers and effluent from installations could create unsightly scenes and aid in the production of vermin. Also, it could serve as breeding grounds for disease causing vectors like mosquitoes, houseflies etc.

Provide bins and skips for waste collection and ensure it is disposed of regularly. Educate workers, vendors and visitors on the importance of proper waste management.

Workplace incidents/accidents

Workers could be exposed to workplace and traffic-related accidents/incidents as well as animal/insect threat/bites during land preparation, civil works and transportation of materials or persons.

Injuries resulting from falling from heights and falling objects, as well as from the misuse of equipment and tools, cuts from stepping on sharp objects such as nails and other metal off-cuts and injuries resulting from clashes between vehicles and the workers as they both operate within the same space are likely to occur during the implementation of the project.

This impact is considered significant since it affects human lives and would therefore require adequate mitigation measures. Occupational health and safety risks are rated highly sensitive because could/may they lead to mortality and long-term morbidity involving site workers. It is, however, localised small scale and short term, implying its magnitude is low. In terms of significance Occupational Health and Safety risks are considered a moderately significant risk, though it has a low magnitude of impact because of its high sensitivity.

To mitigate this impact, the contractor should prepare an Occupational, Health and Safety plan and ensure compliance onsite.

Poor labour working conditions

Lack of employment contracts could lead to workers being paid rates below the stipulated national minimum wage or work under poor conditions. Workers could also be victims of discrimination, forced labour, child labour, restriction of freedom of association and collective bargaining, a non-existent or ineffective worker grievance redress mechanism. Poor Labour working conditions is rated moderate scale, localised and short term, hence low magnitude of impact. It is also highly sensitive since subjecting employees to poor conditions of service and working conditions are against Ghana's labour laws such as Labour Act 2003 (Act 651). Hence this impact is moderately significant.

Provide all workers with signed contracts that are consistent with national labour laws as well as welfare facilities such as potable drinking water, shades, restrooms, etc. Encourage frequent breaks and job-rotation to reduce impact of the weather on workers. Also, policies and codes of conduct should be developed against discrimination, forced and child labour, sexual harassment, and abuse. Workers should be allowed to unionize, and an effective grievance redress mechanism established to address worker grievances.

Traffic risks

Transport of materials and equipment to and from the project site through communities and townships raises traffic/public safety concerns. Broken-down, inappropriately parked or slow-moving haulage/construction trucks could lead to road accidents and traffic congestion especially on busy roads. At night, due to poor or low visibility, there is a high probability of road accidents. Though temporary, this is considered major as it is regional in extent and of high severity because it could result in fatality.

To avoid or reduce road traffic accidents and incidents, only qualified drivers should be used, vehicles must be maintained regularly to ensure that they are in good working condition, use of signs as appropriate and driving at night should be discouraged. Also, speed limits must be set to ensure safe driving e.g. 20km/h onsite, 40km/h on approaching communities along haulage routes and a maximum speed of 100km/h on highways.

Fire outbreak

Fire outbreaks from negligence of workers or the public burning refuse, game hunting and workers not properly extinguishing stubs of cigarette. Fire out breaks may also emanate from power surges or the use of sub-standard electrical cables and sockets. These fires could spread causing injuries or death to persons and destruction of property. Community health and safety risks on the site are rated regional, short term and small scale; low magnitude but highly sensitive because they lead to mortality and long-term morbidity. Hence such impacts are moderately significant.

Gender based violence

Workers with relatively high incomes will be working on the various sites. The site workers can lure girls, hawkers, food vendors, other petty traders who supply them food and other services and defile or rape them. Workers may also abuse themselves and/or supervisors. They can also do same to their wives, partners, children, hawkers, petty traders and food vendors physically or verbally over misunderstanding of prices of goods and services and other issues.

Sexual favours could be demanded in exchange for jobs, promotion or other work-related benefits. Women may also be discriminated against, denied employment opportunities and /or their services may be undervalued on the basis of cultural norms. The incidence of GBV is short-term and small-scale hence considered moderate.

To prevent incidences of GBV, legal processes set out by national law must be followed. Policies on SEA/SH should be developed and implemented. Worker contracts should have clauses and codes of conduct prohibiting rape, defilement, sexual harassment, child/forced labour and other GBV. Measures must be put in place to ensure that women constitute a certain percentage of the workforce i.e. affirmative action. Contact numbers of representative on the Grievance Redress Committee and GBV Service Providers should be pasted around the project site and within the immediate project zone.

Public health issues

Dust borne communicable diseases, respiratory infections and minor throat and eye irritations are expected, especially during the dry season because of the emission of vehicular pollutants and dust (carbon monoxide and particulates). The presence of workers and related increase in disposable cash makes the transmission of STDs a possibility. During project execution (civil works), large numbers of workers will be required to assemble together in meetings, and even at work sites; varied number of workforces including suppliers of material and services are also expected to come in from various places which may be COVID-19 hot spots; and interaction of workers with the project host community. The potential for the spread of any infectious disease like COVID-19 is high.

Improper waste management may create conditions for the growth of vectors of diseases such as cholera and dysentery. The outbreak of these diseases would have far-reaching negative implications for the health of residents and put pressure on the limited health facilities in the area.

An awareness and sensitization campaign together with responsible government agencies like National AIDS Commission should ensure that the people in the project area (workers and locals) are made aware of the issues and provided with condoms. Conduct daily temperature screening of workers and visitors for COVID-19.

Security concerns

Civil works can be associated with theft and pilfering of construction materials normally from the general public and site workers. Site workers can also steal from private properties within the immediate project zone. Other crimes include illicit sexual affairs, child labour and drunk driving, which are criminal under the laws of Ghana.

There may also be confrontations arising out of accidents and destruction of property by workforce, equipment or vehicles. This impact is localized, severe but temporary hence considered moderate.

Workers and local community should be sensitized on cultural tolerance and grievance mechanisms to prevent confrontations. Workers should be made to sign and adhere to a code of conduct which prohibits vices.

Cumulative Negative Impacts of the Project

In the medium to long term, the project implementation is likely to have some cumulative impacts including

- Surface water pollution as a result of runoff carrying waste including refuse, sewage, remnant pesticides/weedicides/fertilizers, poultry waste, waste oils into nearby water bodies
- Contamination of groundwater from mismanagement of boreholes and wells for irrigation and other uses
- Waste generation from multiple sources, and multiple waste and dumping sites from uncoordinated waste management.

Mitigation measures for these impacts include careful design, implementation of the ESMP, and ensuring compliance through monitoring to confirm that activities and their outputs meet permissible limits (e.g. air emissions, chemical use, effluent treatment) under national law and international best practice.

0.9 Public Consultations

0.9.1 Stakeholders consulted

Institutions/stakeholders identified and consulted to work together to ensure sound project implementation and environmental protection are Ministry of Food and Agriculture, Ministry of Lands and Natural Resources, PCU, EPA, Fire Service, Bawku West District Assembly, Commercial farmers, Input Suppliers, Traditional Authorities and Focus Groups (including women and youth) within the project communities. Dates and locations of consultations are presented in the table below:

Group of stakeholders	Stakeholders	Date of consultation	Location of consultation	Total number of persons met	Total women met
Project Proponent/Beneficiary	Ministry of Food and Agriculture	23/11/2021	Bawku West	1	0
	Project Coordinating Unit	18/11/2021	Tamale	2	0
Regulatory Institution	Environmental Protection Agency	21/06/2022	Bolgatanga	1	0

Other Government Institutions	Ghana National Fire Service-Bawku West	08/12/2021	Bawku West	3	0
	Bawku West District Assembly				
	National Disaster Management Organization, Bawku West	23/11/2021	Bawku West	1	0
Other stakeholders	Commercial Farmer (Bawkuu West)	08/12/2021	Bawku West	1	0
	Commercial Farmer, Bawku West	12/12/2021	Bawku West	6	0
	Commercial Farmer, Bawku West	23/11/2021	Bawku West	2	0
	NGO, Bawku West	13/12/2021	Bawku West	1	0
	NGO, Bawku West	13/12/2021	Bawku West	1	1
	NGO, Bawku West		Bawku West	2	1
	Farmers	24/11/2021	Ankpaliga	1	0
		08/12/2021	Sitande	7	7
		07/12/2021	Gbere	4	4
		07/12/2021	Boya – Kpalsako	6	6
	Traditional Authority	09/12/2021	Lamboya	1	0
		09/12/2021	Biringu	4	0
		27/11/2021	Sakpe	2	0
	Women Group	07/12/2021	Boya – Kpalsako	6	6
		6/12/2021	Gbere	4	4
		08/12/2021	Sitande	7	7

0.9.2 Opinion of stakeholders about the project

All stakeholders consulted were enthused about the project and indicated their readiness to lend their support for the successful implementation of the project. Most communities were, however, not aware of the project and advised that further engagement be conducted to sensitize the beneficiary and surrounding communities.

0.9.3 Concerns raised by stakeholders consulted and proposed solutions

The stakeholders engaged are in support of the project and are committed to ensuring smooth implementation of the project. Some of their major issues however include:

- **Project implementation and supervision** – Farmers should be allowed to partake/contribute some resources to the project rather than being fully reliant on the project. There should be a memorandum of understanding between farmers and the project to ensure a sense of responsibility by the farmers. The project implementing unit should be open about all issues

concerning the project. Selection of beneficiaries should not be politically biased The project should be routed through agricultural departments because they are in charge of agricultural activities.

- **Community engagement and sensitization** – Beneficiaries should be adequately informed and made aware that it is their property to increase the sense of ownership and prevent apathy on their part.
- **Women participation and equitable resource allocation** – More women should be selected to be part of the project. Women should be included in the project because they are the primary caregivers in the community and are most affected by security, food, and nutrition issues. Small ruminants that are easy to rear by women should also be provided as farm animals.
- **Socio-economic issues** – The project should target community members and provide resources that are proportionate to their needs. Some attention should be given to vulnerable groups.
- **Environmental issues and natural disasters** – Adequate education should be given to beneficiaries on possible hazards and ways of mitigating them. Fire volunteers should be trained within communities to provide fire-fighting support. Fire belts should be created around project sites to prevent the occurrence of fires.
- **Financial support** – The project should assist in providing financial support to beneficiaries as most people especially women depend on Village Savings and Loans Associations (VSLA)
- **Transportation** - Adequate and affordable means of transportation should be made available to beneficiaries to facilitate the transportation of livestock, produce and inputs.
- **Provision of farm inputs and machinery** - The project should provide farm inputs like vaccines at subsidized rates and procure adequate machinery to facilitate production.
- **Community leadership and governance** – At the local level, the key decision makers are the Chief and elders, religious leaders, youth groups and opinion leaders. The assembly member serves as government representative and is also revered by locals.
- **Land ownership, right and access** - Majority of lands are skin lands and can be accessed through a request from the traditional authorities. Squatting and land-related conflicts are rare. Land-related conflicts are very few and these are mostly as a result of unsettled differences among.
- **Vulnerable groups** - There are some women-headed households and persons with disability who have limited access to land and no livelihood support. Some households require support for survival especially during the non-farming season.
- **Community challenges** - Communities have challenges with electricity, health care, water and farming support.

0.10 Environmental and Social Management Plan

Environmental and Social Management Plan Matrix

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
Preparatory Phase							
Restricted access to pastures	Construction	• Site preparation	• Repair or remedy	• Identify and propose alternative pasture areas to locals who otherwise used the project site as pasture area. • Provide locals with some financial and technical support to acquire a sustainable source of feed for their livestock.	PCU	Environmental and Social Safeguards Specialists of PCU	5,000
Destruction of vegetation and displacement of wildlife	Construction	• Site preparation	• Offset	• Clear only area required for the project • Reinstate excavated areas immediately after works to prevent excavated spoil from being transported by runoff into nearby water bodies • Stray animals that are observed at or around project sites should be given safe passage to nearby bush and not killed. • Hunting and or killing of wildlife/animals in bushes around project site by construction/other workers should be prohibited and made punishable.	Works contractor	Environmental Safeguards Specialist of PCU	5,000
Construction Phase							
Soil erosion	Construction	• Project site	• Repair or remedy	• Landscape should be reinstated or regenerated to reflect its original general view before the project. • All excavations and trenches should immediately be backfilled and compacted to its original state.	Works contractor	Environmental Safeguards Specialist of PCU	2,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
Air Pollution	Construction	• Project site and haulage route	• Avoid or reduce at source	• Trucks and heavy machinery with a valid emission test pass certificate should only be allowed on the project site. • Dust pollution must be reduced by ensuring that drivers do not speed especially on untarred roads. • Suppress dust by watering dusty construction areas. • Ensure the use of nose mask in dusty environment.	Works contractor	Environmental Safeguards Specialist of PCU	5,000
Water Pollution	Construction	• Project site	• Avoid at source	• Conduct regular maintenance on trucks to prevent oil leakages that could be washed together with sediment into nearby waterbodies • Manage leaked oil by placing trays under trucks to collect leaked oil.	Works contractor	Environmental Safeguards Specialist of PCU	15,000
Noise Nuisance	Construction	• Equipment and vehicles on site	• Abate on site	• Unnecessary tooting of horn by truck drivers must be avoided. • A noise assessment must be carried out for all heavy machinery prior to use at the site to ensure noise levels are in compliance with EPA's guidelines values. • Noise should be kept to a minimum with hearing protection used as deemed necessary for workers. Earmuffs or earplugs are recommended for ear protection. The level of noise must be continuously assessed to keep it within acceptable limits. • All equipment and tools must be checked for suitability for the task. • All construction equipment and hand tools should be operated by trained, experienced and competent persons, and where required persons must produce operator's license upon request.	Works contractor	Environmental Safeguards Specialist of PCU	5,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Ensure the use of well serviced/maintained vehicles and other equipment with acceptable noise emission levels. • Provide silencers on all noise generating equipment.			
Waste generation and inefficient management	Construction	• Project site	• Abate or reduce at source	• Ensure that construction debris are collected from work sites to avoid blocking of drains and waterways. • Waste bins must be provided and well labelled for waste segregation and disposal. • Only licensed waste management companies must be engaged to collect and dispose of waste collected from the site. • Regular briefing or training on waste management must be provided to workers at the site. • Have SOPs for managing hazardous and non-hazardous waste.	Works contractor	Environmental Safeguards Specialist of PCU	20,000
Workplace accidents/incidents	Construction	• Project site	• Abate on site	• Good housekeeping around work area must be ensured to prevent slips, trips & falls. • Only trained and competent workers should be allowed to carry out work and must be well briefed on safe working procedures. • Appropriate work platforms and PPE must be used for specific tasks such as work at height. • Mandatory and basic PPE including hardhat, hand gloves, safety goggles, HiVis and safety boots must be worn. • Have accident and incident reporting form available to record accidents and near-misses	Works contractor	Environmental Safeguards Specialist of PCU	20,000
Poor labour working conditions	Construction	• Project Site	• Avoid at source	• Provide all workers with signed contracted that are consistent with national labour laws	Works contractor	Environmental and Social Safeguards	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Provide welfare facilities such as potable drinking water, shades, restrooms etc. for workers. • Encourage frequent breaks and job-rotation to reduce impact of the weather on workers.		Specialists of PCU	
Traffic accident risks/Public safety concerns	Construction	• Project site	• Abate on site	• Hoard project site to prevent unauthorized entry • Ensure all visitors accessing site are in appropriate PPE • The highway code must be strictly followed. Driver training must be provided as part of induction training and permit to drive and transportation of materials to project site issued. • Trained flagmen (to slow down traffic) or trained stop-go men (to halt traffic) must be used to ensure safety when trucks are leaving the project site. • Stop-go men and flagmen must also wear high visibility vests and use approved stop-go signs or flags. • Vehicles to be used on the project must provide maintenance records and must also be inspected by a competent person before allowed on the project. • Have checklists available to manage vehicle and equipment maintenance and management • Arrangements must be made for truck drivers to ensure peak times are avoided for haulage of materials to site. • Appropriate warning signs including reduced speed, “Men at Work”, “No Parking” & hazard triangle must be placed beside road facing oncoming traffic and a similar “End” sign after work area. • Ensure that all trucks used are serviced regularly to maintain optimal performance and ensure safety.	Works contractor	Environmental and Social Safeguards Specialists of PCU	8,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Identify safe parking areas off main roads to allow for unloading and long-term parking of vehicles. • Have accident and incident reporting form to record accidents and near-misses.			
Fire outbreaks	Construction	• Project community interactions	• Avoid at source, repair or remedy	• Create fire belts around project site to deal with any fire incidents • Liaise with the Fire Service to sensitize workers and the community on fire risks • Secure fire extinguishers for fire fighting	Works contractor	Environmental and Social Safeguards Specialists of PCU	20,000
Public health issues	Construction	• Project-community interactions	• Avoid at source	• Provide information, instructions and trainings on STDs, drug abuse etc. to the workers to create awareness. • Provide female and male condoms to the community and workers. • Conduct daily temperature screening of workers and visitors. • Provide handwashing stations and sanitizers at all sites. • Ensure workers and visitors adhere to all COVID-19 protocols including wearing of face mask and social distancing. • Encourage workers to get vaccinated. • Organize trainings on COVID-19 and STDs for the workers and the community to create awareness. • Provide female and male condoms to the community and workers.	Works contractor	Environmental and Social Safeguards Specialists of PCU	15,000
Security concerns	Construction	• Project site	• Abate or reduce at source, abate on site	• Provide adequate security by liaising with Police to conduct regular patrols • Sensitize local community on cultural tolerance and grievance mechanisms to prevent confrontations	Works contractor	Environmental and Social Safeguards Specialists of PCU	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
Gender based violence	Construction	• Project and community interaction	• Avoid at source, repair or remedy	• Include in works contract clauses on mandatory and regular training for workers on required lawful conduct and legal consequences for failure to comply with laws on non-discrimination and GBV • Insert clause requiring contractors and consultants to cooperate with law enforcement agencies investigating cases of gender-based violence • A minimum requirement of female employment should be indicated in contract documents • Clauses prohibiting rape, defilement and other Gender based Violence as well as child and forced labour should be inserted into works contracts • Contact numbers of representative on the Grievance Redress Committee and GBV Service Providers should be pasted around the project site and within the immediate project zone • Discuss issues of Gender Based Violence at daily Toolbox meetings • Display on site posters prohibiting sexual exploitation and harassment	Works contractor	Environmental and Social Safeguards Specialists of PCU	10,000
Operation Phase							
Soil erosion	Operation	• Facility site	• Avoid or reduce at source	• Landscape should be reinstated or regenerated to reflect its original general view before the project. • All excavations and trenches should immediately be backfilled and compacted to its original state.	Facility manager	EPA, Agric Department, District Assembly EHU	5,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
Air Pollution	Operation	• Facility site	• Avoid or reduce at source	• Trucks and heavy machinery with a valid emission test pass certificate should only be allowed on the project site. • Dust pollution must be reduced by ensuring that drivers do not speed especially on untarred roads. • Suppress dust by watering dusty construction areas. • Ensure the use of nose mask in dusty environment.	Facility manager	EPA, Agric Department, District Assembly EHU	10,000
Water Pollution	Operation	• Facility site	• Avoid at source	• Conduct regular maintenance on trucks to prevent oil leakages that could be washed together with sediment into nearby waterbodies • Manage leaked oil by placing trays under trucks to collect leaked oil. • Monitor volumes of water used and keep records • Promptly fix faulty or leaking pipes to preserve water • Prepare an Integrated Pest/Vector Management Framework/Plan to address the impacts on receptors such as waterbodies, beneficiary organisms, humans and animals, insects, fishes, etc. from the expanded use of agrochemicals, including inorganic fertilizers for growth improvement and pesticides against the spread of pests and diseases.	Facility manager	EPA, Agric Department, District Assembly EHU	7,000
Noise Nuisance	Operation	• Facility site	• Avoid or reduce at source	• Unnecessary tooting of horn by truck drivers must be avoided. • A noise assessment must be carried out for all heavy machinery prior to use at the site to ensure noise levels are in compliance with EPA's guidelines values. • Noise should be kept to a minimum with hearing protection used as deemed necessary for workers. Earmuffs or earplugs are recommended for ear	Facility manager	EPA, Agric Department, District Assembly EHU	8,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				protection. The level of noise must be continuously assessed to keep it within acceptable limits. • All equipment and tools must be checked for suitability for the task. • All equipment and hand tools should be operated by trained, experienced and competent persons, and where required persons must produce operator's license upon request. • Ensure the use of well serviced/maintained vehicles and other equipment with acceptable noise emission levels. • Provide silencers on all noise generating equipment.			
Waste generation and inefficient management	Operation	• Facility	• Reduce at source	• Waste bins must be provided and well labelled for waste segregation and disposal. • Only licensed waste management companies must be engaged to collect and dispose of waste collected. • Regular toolbox talk on waste management must be provided to operatives/workers at the facility. • Have SOPs for managing hazardous and non-hazardous waste.	Facility manager	EPA, Agric Department, District Assembly EHU	20,000
Poor labour working conditions	Operation	• Facility site	• Avoid at source	• Provide all workers with signed contracted that are consistent with national labour laws • Provide welfare facilities such as potable drinking water, shades, restrooms etc. for workers. • Encourage frequent breaks and job-rotation to reduce impact of the weather on workers.	Facility manager	Agric Department, District Assembly EHU	10,000
Traffic accident risks/Public safety concerns	Operation	• Facility	• Abate on site	• Ensure all visitors accessing site are in appropriate PPE • The highway code must be strictly followed. Driver training must be provided as part of induction training	Facility manager	EPA, District Assembly EHU	8,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				and permit to drive and transportation of materials to project site issued. • Trained flagmen (to slow down traffic) or trained stop-go men (to halt traffic) must be used to ensure safety when trucks are leaving the project site. • Stop-go men and flagmen must also wear high visibility vests and use approved stop-go signs or flags. • Vehicles to be used on the project must provide maintenance records, and must also be inspected by a competent person before allowed on the project. • Have checklists available to manage vehicle and equipment maintenance and management • Arrangements must be made for truck drivers to ensure peak times are avoided for haulage of materials to site. • Appropriate warning signs are put in place, as required. • Ensure that all trucks used are serviced regularly to maintain optimal performance and ensure safety. • Identify safe parking areas off main roads to allow for unloading and long-term parking of vehicles. • Have accident and incident reporting form to record accidents and near-misses.			
Fire outbreaks	Operation	• Project community interactions	• Avoid at source, repair or remedy	• Create fire belts around project site to deal with any fire incidents • Liaise with the Fire Service to sensitize workers and the community on fire risks • Secure fire extinguishers for fire fighting	Facility manager	EPA, Fire Service, Agric Department, District Assembly EHU	5,000
Public health issues	Operation	• Project community	• Avoid or reduce at source	• Provide information, instructions and trainings on STDs, drug abuse etc. to the workers to create awareness.	Facility manager	EPA, Health Directorate,	15,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
		interactions		• Provide female and male condoms to the community and workers. • Conduct daily temperature screening of workers and visitors. • Provide handwashing stations and sanitizers at all sites. • Ensure workers and visitors adhere to all COVID-19 protocols including wearing of face mask and social distancing. • Encourage workers to get vaccinated. • Organize trainings on COVID-19 and STDs for the workers and the community to create awareness. • Provide condoms to the community and workers.		District Assembly EHU	
Security concerns	Operation	• Community	• Avoid or reduce at source	• Provide adequate security by liaising with Police to conduct regular patrols or make private security arrangement • Sensitize local community on cultural tolerance and grievance mechanisms to prevent confrontations	Facility manager	District Security Committee, EPA	8,000
Gender based violence	Operation	• Workers, community	• Avoid or reduce at source, repair and remedy	• Include in works contract clauses on mandatory and regular training for workers on required lawful conduct and legal consequences for failure to comply with laws on non-discrimination and GBV • Insert clause requiring contractors and consultants to cooperate with law enforcement agencies investigating cases of gender-based violence • A minimum requirement of female employment should be indicated in contract documents • Clauses prohibiting rape, defilement and other Gender based Violence as well as child and forced labour should be inserted into works contracts	Facility manager	EPA, District Social Welfare Department	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Contact numbers of representative on the Grievance Redress Committee and GBV Service Providers should be pasted around the project site and within the immediate project zone • Discuss issues of Gender Based Violence at daily Toolbox meetings • Display on site posters prohibiting sexual exploitation and harassment			
TOTAL COST OF ESMP IMPLEMENTATION							**256,000**

Environmental Monitoring Matrix

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
CONSTRUCTION PHASE						
	Workplace accidents/incidents	• Records of accidents, incidents and near misses. • Records of PPE disbursed • Housekeeping	• Construction site	Monthly	Environmental and Social Safeguards Specialists	5,000
	Poor labour working conditions	• Availability of copies of signed contracts • Human Resource Management Plan/Recruitment Policy • Complaints lodged by workers	• Construction site	Quarterly	Environmental and Social Safeguards Specialists	3,000
	Soil impacts and sediment transport	• Observable change in turbidity of water in drains or water bodies • Observable oil sheen in drain • Observation of rills/gullies	• Construction site and Immediate environs	Monthly	Environmental Safeguards Specialist	4,000
	Air and Noise Pollution	• Dust (PM2.5, PM10 and TSP) • Emissions (NOx, SOx, TSP) • Noise (dB) levels • Number of complaints by residents/workers	• Construction site and Immediate environs	Monthly	Environmental Safeguards Specialist	5,000
	Waste generation and inefficient management	• Number of mobile toilets and dustbins provided on site • Number of times waste is lifted in a week i.e. waste transfer notes • Cleanliness of site/housekeeping • Odour	• Construction site and Immediate environs	Weekly	Environmental Safeguards Specialist	3,000

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
		• Presence of human waste on site • Complaints by workers/residents				
	Traffic accident risks/Public safety concerns	• Grievance records • Traffic related incidents/accidents • Records of accidents, incidents and near misses.	• Construction site and Immediate environs	Monthly	Environmental and Social Safeguards Specialists	5,000
	Fire outbreaks	• Fire related incidents/accidents • Records of fire incidents and near misses. • Number of functional fire extinguishers onsite	• Construction site and Immediate environs	Monthly	Environmental and Social Safeguards Specialists	5,000
	Public health issues	• Number of sensitization campaigns • Number of condoms distributed to Contractor's staff in a month • Number of STD cases reported to local health facilities involving encounters with Contractor's staff	• Construction site and Immediate environs	Monthly	Environmental and Social Safeguards Specialists	4,500
	Security and GBV concerns	• Number of conflicts/cases reported to the Grievance Redress Committee/Community Liaison Officer • Number of conflicts/cases dealt with by the Grievance Redress Committee • Number of crimes such as theft, defilement and rape reported, investigated, and concluded by the police involving the Contractor's workers	• Construction site and Immediate environs	Monthly	Environmental and Social Safeguards Specialists	3,500
OPERATIONAL PHASE						

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
	Workplace accidents/incidents	• Records of accidents, incidents and near misses. • Records of PPE disbursed • Housekeeping	• Facility site	Monthly	HSE Manager	3,000
	Poor labour working conditions	• Availability of copies of signed contracts • Human Resource Management Plan/Recruitment Policy • Complaints lodged by workers	• Facility site	Monthly	HSE Manager and HR Manager	4,000
	Soil impacts and sediment transport	• Observable change in turbidity of water in drains or water bodies • Observable oil sheen in drain • Observation of rills/gullies	• Facility site and immediate environs	Monthly	HSE Manager	5,000
	Air and Noise Pollution	• Dust (PM2.5, PM10 and TSP) • Emissions (NOx, SOx, TSP) • Noise (dB) levels • Number of complaints by residents/workers	• Facility site and immediate environs	Monthly	HSE Manager and Community Liaison Officer	3,000
	Waste generation and inefficient management	• Presence of toilets and number dustbins provided on site • Number of times waste is lifted in a week • Cleanliness of site/housekeeping • Odour • Presence of human waste on site • Complaints by workers/residents	• Facility site and immediate environs	Weekly	HSE Manager and Community Liaison Officer	5,000

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
	Traffic accident risks/Public safety concerns	• Grievance records • Traffic related incidents/accidents • Records of all accidents, incidents and near misses.	• Facility site and immediate environs	Monthly	HSE Manager and Community Liaison Officer	5,000
	Fire outbreaks	• Fire related incidents/accidents • Records of fire incidents and near misses. • Number of functional fire extinguishers onsite	• Facility site and immediate environs	Monthly	HSE Manager and Community Liaison Officer	3,000
	Public health issues	• Number of sensitization campaigns • Number of condoms distributed to workers or placed in washrooms in a month • Prevalence of STD cases reported to local health facilities	• Facility site and immediate environs	Monthly	HSE Manager and Community Liaison Officer	4,500
	Security and GBV concerns	• Number of conflicts/cases reported to the Grievance Redress Committee/Community Liaison Officer • Number of conflicts/cases dealt with by the Grievance Redress Committee • Number of crimes such as theft, defilement and rape reported, investigated, and concluded by the police involving workers or patrons	• Facility site and immediate environs	Monthly	HSE Manager and Community Liaison Officer	3,500
	TOTAL COST FOR MONITORING					**74,000**

Grievance Redress Mechanism

The activities of the project may generate grievances arising from the interaction between project and local authorities/community, workers and the host community etc. Some potential grievances identified and likely to occur during project implementation include:

- Complaints from the local community on the conduct of workers, especially sexual harassment and other gender-based offenses;
- Complaints related to noise, dust, traffic incidents; and
- Restriction of access to persons who otherwise were using portions of land e.g. for grazing
- Failure to consider the recruitment of local man-labour;
- Non-respect of the habits and customs of the host community by the actors of the site;
- Non-compliance with the measures or provisions contained in the ESMP

In managing grievances, a Grievance Redress Mechanism will be employed and it will include:

- Setting up of a Grievance Redress Committee (GRC) at the community level (13 GRCs, 1 for each community) and the district level to receive and address grievances from stakeholders.
    - At the community level, the GRC will be made up of the Assemblyman, the Chief, a Youth Leader, and a representative of the project affected persons (PAPs). The Assemblyman will be responsible for receiving grievances and subsequently liaise with the other members of the GRC to have the issue resolved.
    - At the district level, the GRC will be made up of the District Planning Officer, District Lands Officer, A representative of the Agric Directorate, and District Social Welfare Officer.

- The PCU will constantly engage project affected persons through its Stakeholder and Public Disclosure Plan. This will keep the communities informed of developments on the project, including planned activities, project impacts and mitigation measures, grievance mechanism, the right to submit complaints and the compensation process.

- Building capacity of the Assemblymen to ensure they can engage the communities, record and ensure grievances are resolved.

Grievances are expected to be communicated either verbally (in a language of choice) or in writing to the GRC. Upon receipt of complaints, timely responses are expected to be given. It is expected that if grievances cannot be resolved locally, then these will be referred quickly to the District Council GRC for resolution.

Actions to be taken to address the grievance will be agreed upon by the GRC, and progress of implementation of agreed measures reported to the Local community, Metropolitan Assembly, PCU and Ministry of Food and Agriculture on a weekly and monthly basis.

ESMP Implementation Budget

No	Activity	Description	Responsibility	Total Cost, US$	Source of finance
A	**Institutional measures**				
1	Remuneration of the project's environmental safeguard specialist over 5 years	Implementation of ESMP	PIU	120,000	Project funds
2	Remuneration of the project's social safeguard specialist over 5 years	Implementation of ESMP	PIU	120,000	Project funds
3	Remuneration of the MDC environmental and social safeguard specialist over 10 months	Implementation of ESMP	PIU	20,000	Project funds
4	Remuneration of the environmental and social safeguard specialist of the works company over 12 months	Implementation of ESMP	PIU	24,000	Project funds
B	**Technical measures**			**256,000**	
	Specific technical measures				
5	Awareness creation on Project	Stakeholder engagement	PIU/ESS/SSS	5,000	Project funds
6	Capacity building for key stakeholders	Training workshop on National and AfDB requirements, EIA procedures, social measures and incorporating environmental and social measures etc. in contract documents.	PIU/Consultant	10,000	Project funds
7	Public engagement/ sensitization	Sensitization and engagement of project affected persons	PIU/Consultant	15,000	Project funds
8	Grievance Redress Mechanism (GRM)		PIU/ESS/SSS	79,000	Project funds
9	Decommissioning	Dismantling and removal of structures and equipment and waste disposal		15,000	Project funds
C	**Monitoring and Audits**				
10	Monitoring of environmental and social parameters of the works		PIU/ESS/SSS	267,000	Project funds
11	Annual E&S compliance Audits	To evaluate the compliance of the implementation of the project's E&S measures (ESMP)	PIU/ESS/SSS	150,000	Project funds
	TOTAL of the ESMP IMPLEMENTATION			**1,081,000**	

1.0 INTRODUCTION

1.1 Background of the Project

The African Development Bank has launched the Feed Africa Strategy that takes a commodity value chain and Agro-Ecological Zones (AEZ) approach with emphasis on commodities that possess comparative advantages and potential for import substitution, future demand, and poverty alleviation. Also, in response to the novel coronavirus, COVID-19, the Feed Africa Response to the Impact of COVID-19 (FAREC) outlines measures to increase localized food production via targeted provision of agricultural inputs such as improved seeds, fertilizer, and other agro-chemicals through smart input subsidies targeting farmers and tying interventions to seasonal timetables. It also provides measures for post-harvest management to produce highly nutritious food and staple products that store for longer periods, policy support for free flow of food and inputs distribution ("green channels") and increased food production.

The Government of the Republic of Ghana through the Ministry of Food and Agriculture (MoFA), and with assistance from the African Development Bank (AfDB) through the Feed Africa Strategy, seeks to develop the savannah areas as part of Government's ongoing efforts in Planting for Food and Jobs (PFJ) and Rearing for Food and Jobs (RFJ) programs. This support is to allow medium scale commercial farmers and their out growers to expand areas under cultivation for rice, soybean and maize under PFJ, which feeds into poultry value chain under RFJ. This integrated approach supports elements of growing at scale and provision of market outlets for smallholder farmers, especially women and youth.

The Savanah Agriculture Value Chain Development Project (SADP) is being implemented to serve as part of post COVID-19 reconstruction efforts aimed at addressing disruptions in food systems of the Government of Ghana. It builds on earlier successes under the Savannah Zone Agriculture Productivity Improvement Project (SAPIP) and Savannah Investment Programme (SIP) that have so far expanded the production of maize and soybean from 80 hectares in 2018 to 14,000 hectares in 2021.

This current SADP is expected to build on the achievements made and to further expand production of rice, soybean and maize by additional 8,000 hectares by 2026. The SADP project, is being implemented in nine (9) different Metropolitan, Municipal and District Assemblies (MMDAs) namely (1) Tamale Metro, (2) Mion, (3) Savelugu in the Northern Region; (4) East Mamprusi in the North East Region; (5) West Gonja in the Savannah Region; (6) Bawku West, in the Upper East Region; (7) Wa Municipal, (8) Sissala East, and (9) Nandom in the Upper West Region of Ghana.

In line with environmental permitting requirements **(Annex 1a and b)** as provided under the Environmental Protection Agency (EPA) Act, 1994 (Act 490) and the Environmental Assessment Regulations of 1999 (LI1652), this Environmental Impact Assessment (ESIA) has been carried out to help understand the likely implications of the proposal in order to inform the environmental permitting decision-making prior to project implementation in Bawku West District. Also, the ESIA will ensure the project and subprojects comply with the requirements of the Bank's Integrated Safeguards System (ISS).

1.2 Objective of the Project

The overall goal of the project is to increase production of livestock (particularly poultry meat), contribute to industrialization, youth employment and food security. The project is expected to contribute to the Government's industrialization agenda, including One District One Factory (1D1F), support skills development and entrepreneurship for women and youth, and build resilient food systems in the savannah areas of northern and middle belts of Ghana.

1.3 Purpose of the ESIA

The scope of work for the ESIA study is to among other things:

- Provide technical description of the proposed project and identify all activities of environmental/social concerns;
- Establish the existing environmental and socio-economic baseline conditions of the project area of influence;
- Predict and examine all the significant environmental impacts on the surrounding communities and the general environment during implementation of the proposed project and advise on appropriate mitigation and abatement measures against potential adverse impacts;
- Provide a monitoring program for predicted impacts and mitigation measures;
- Provide an Environmental and Social Management Plan (ESMP) integrating Grievance Redress Mechanism (GRM);
- Document the socio-economic and cultural advantages and disadvantages associated with the proposed project for stakeholders and interested groups to make an informed decision on the level of environmental compromise and permitting.
- Provide a plan to guide the development of an emergency response plan for the project;
- Provide guidelines to be followed in the event of decommissioning; and
- Carry out public consultations and include the outcome in the ESIA report with arrangements to address stakeholder concerns.

1.4 Methodology for the Assessment Process

This report has been prepared in accordance with applicable African Development Bank and Ghanaian environmental assessment guidelines and involves the following activities:

- **Data gathering**; The Consultant assembled and evaluated relevant baseline data relating to the biophysical and socio-economic environment to be influenced by the project. The baseline data include climate, topography and relief, geology and soil, vegetation, demography, access to basic services and socio-economic conditions. In addition, this report has scoped out the issues and provided general assessment of the impacts.

- **Stakeholder identification and consultations**; Key stakeholders identified include Ministry of Food and Agriculture (Department of Agriculture), Environmental Protection Agency (EPA) of Ghana, Savannah Zone Productivity Improvement Program (SAPIP) and Savannah Investment Programme (SIP), Bawku West District Assembly, Lands Commission, Fire Service, Produce Suppliers, Commercial

Farmers, Farmer Based Organizations, Assembly Representatives, Community Focus Groups including Traditional Authority, Youth Groups, Women Groups etc. Stakeholders were engaged from November 18 – December 13, 2021 and the outcomes of engagements with key stakeholders have been reviewed and incorporated in the study (**See Details in Section 10 and Annex 5**).

- **Data collation and analysis;** The report preparation involved review of project documents, related Environmental Impact Statements (EIS), as well as EPA, and AfDB reference documents as follows:
  - Project Documents (Project Implementation Document);
  - District Profile for the Bawku West District;
  - Medium Term Development Plan;
  - Population and Housing Census Report, 2015 and 2021;
  - Technical sheets for project development;
  - Ghana EPA Guidelines
  - GoG and AfDB Reference Documents
  - Sector policy documents and regulations; and
  - Relevant international conventions.

1.5 The ESIA Report Content and Structure

EPA guidelines for preparation of ESIA and the AfDB Integrated Safeguards System (ISS) guided the preparation of this ESIA report. The outline of the report includes the following:

- A non-technical executive summary;
- An introduction describing the ESIA purpose, objectives, approach and methodology;
- A description of the project, with an emphasis on subproject scope;
- Analysis of alternatives;
- Policy, legal and administrative framework;
- Baseline environmental and social conditions of the Bawku West District;
- Potential environmental and social issues and impacts;
- Proposed mitigation measures;
- Environmental and social management plan requirements;
- Institutional arrangement for the implementation of the ESMP;
- Monitoring and reporting arrangements;
- Capacity building and training required to implement the ESMP;
- Stakeholder Engagement and public consultations and disclosure;
- ESMP implementation budget;
- Conclusion; and
- Annexes.

2.0 PROJECT DESCRIPTION

2.1 Project Scope

As part of the comprehensive strategy by the current administration of the country is to resolve the perennial challenges with the livestock sector, and provide incremental jobs in the country, the government has designed a strategic program intervention, Rearing for Food and Jobs (RFJ). This program is to overcome the food and nutritional deficits situation and reduce drastically the importation of basic livestock commodities where Ghana has both competitive and comparative advantage to produce, as well as create more jobs within the agriculture and related sectors. The RFJ program focuses on five key livestock species in the country including cattle, sheep, goats, pigs and poultry.

The overall goal of the project is to increase production of livestock (particularly poultry meat), contribute to industrialization, youth employment and food security. The project is expected to contribute to the Government's industrialization agenda, including One District One Factory (1D1F), support skills development and entrepreneurship for women and youth, and build resilient food systems in the savannah areas of northern and middle belts of Ghana. This would be achieved through the facilitation of private sector investment in value chains associated with meat production, improved productivity and production of feedstock made up of rice, maize and soybean, a purposive intervention in poultry value chain. At least 8,000 Ha of rice, maize and soybean is expected to be put under cultivation and small-medium scale poultry farmers supported. It is expected to increase productivity of soybean from average of 0.8 tons/ha to 3.0 tons/ha; maize from 2.5 tons/ha to 5.5tons/ha and rice from 3.0 tons/ha to 3.5 tons/ha. At least 50 million additional broiler produced by 2026. Increased domestic production seeks to reduce importation of these basic commodities, creating jobs for women and youth along the priority value chains.

2.2 Project Locations

The programme will cover generally the Savannah Ecological Zone of Ghana for the Technologies for African Agricultural Transformation (TAAT-s) and specifically focus on 9 Districts that have the potential for maize, soya and rice production. It is also imperative to consolidate the gains of other programmes and projects that operated or are operating in these districts.

In the Bawku West District, there is the potential for the production of rice in lowland areas especially in valleys. For the production of maize and soya, majority of the upland areas are suitable and the potential beneficiary communities, listed in **Table 2-1 and shown in Figure 2-1**, have been selected based on these reasons.

Table 2- 1: Potential beneficiary communities

District	Potential Upland Communities for Maize and Soya production	Potential Rice Valley Communities
Bawku West District	Gbere	Yariga
	Boya Kpalsako	Tanga Kpantarigu
	Sitande	
	Biringu	
	Lamboya	
	Tilli	
	Zongoire	
	Farik	
	Widnaba	
	Gundago	
	Googo	

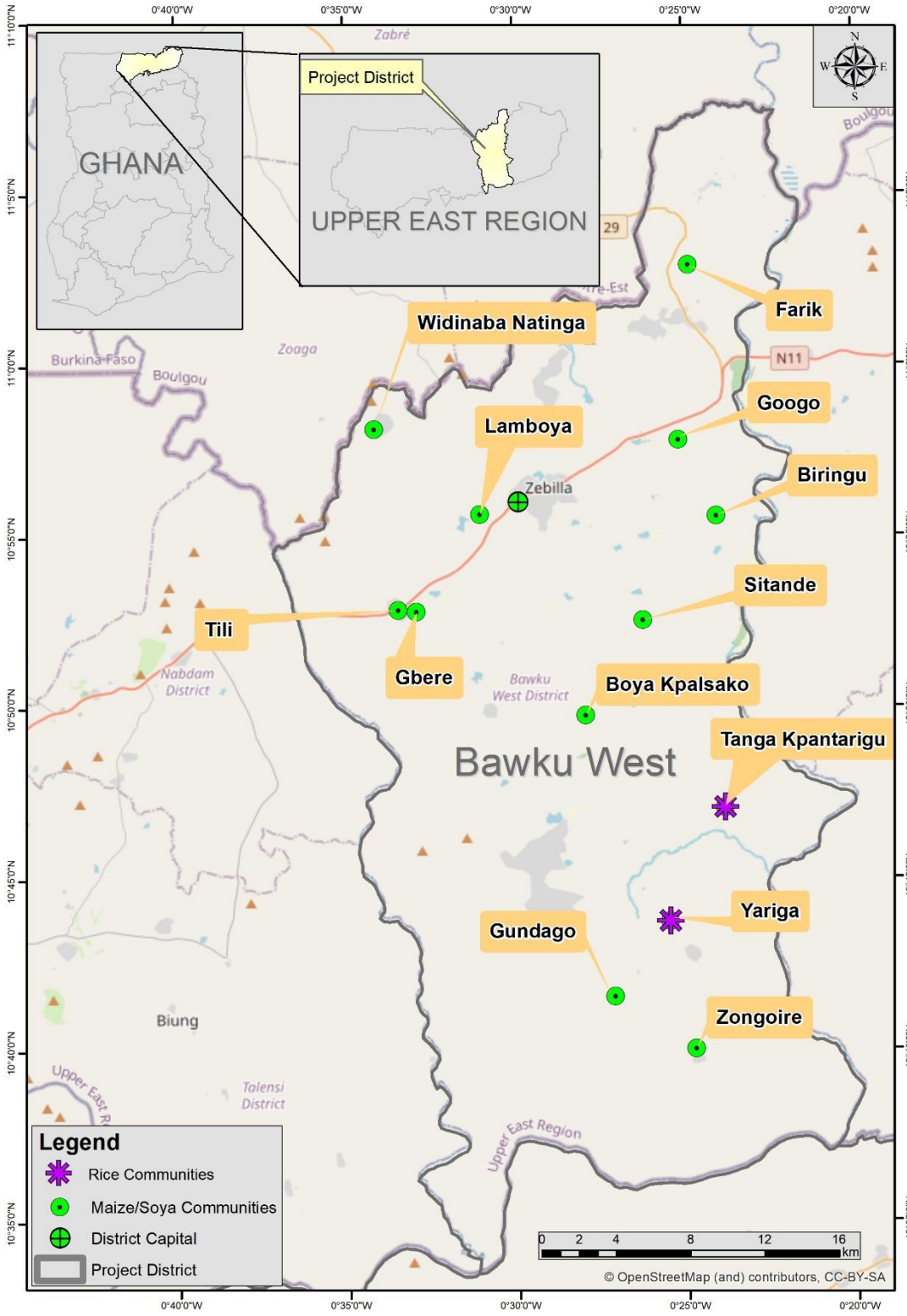


Figure 2- 1: Location map of Bawku West District showing potential beneficiary communities

2.3 Project Components

The proposed project will have three components namely (i) Component 1: Production Development, (ii) Component 2: Integrated Agribusiness and Value Chain Development, and (iii) Component 3: Project Management and Institutional Support.

Component 1: Production Development:

This component aims to support farmers with interventions including land development in inland valleys for rice production, following land and soil suitability surveys. It will also support land development under no-tillage systems using conservation agriculture. It will promote the use of economic trees as part of alley-cropping and promote measures to reduce bush fires. These measures will include the enforcement of community by-laws and establishment of fire belts. It will promote the use of hybrid seeds and bio-pesticides for the control of invasive pests including fall armyworm. There will be no land acquisition under this project. One key criterion for participating farmers is for them to own land under cultivation for which an expansion is required. There are no settlements/population in the inland valleys where water management structures are to be developed. Activities regarding land development will therefore not cause displacement (temporal or permanent).

Sub-component 1.1 Commercial Production of Maize and Soybean under Conservation Agriculture

- Production and promotion of certified hybrid maize and improved soybean seeds, in collaboration with seed companies.
- Support to land development and mechanisation services.
- Training of producers, haulers, aggregators and marketers on sanitary and phytosanitary (SPS) issue relating to maize and soybeans
- Farmer mobilisation and awareness creation on conservation agriculture.
- Train project staff and farmers on Integrated Crop and Pest Management (ICPM), including biological control options for the management of Fall Army Worm (FAW) and aspergillus on Maize and Soybeans.
- Conduct surveillance and collect data on pests attacking the Maize and Soybeans in the project zones with specific reference to FAW.
- Support out-grower contractual arrangements
- Use of ICT for soil suitability assessment and GIS mapping of commercial farms
- Promotion of climate smart agriculture, environmental conservation best practices, including use of economic trees such as shea, dawadawa, mango, cashew etc.
- Community sensitization, Establishment of fire belts and enforcement of community fire by-laws to deal with the impact of bush fires.
- Promote the use of Nitrogen fixing inoculants to boost soybean yield.

Sub-component 1.2 Promotion of Small and Medium Scale Commercial Poultry Production

- Input support to small and medium scale commercial poultry farmers (poultry cages, day old chicks, feed stock, vaccines, veterinary drugs, etc.)

- Supply of local chicken to vulnerable households, especially women headed households
- Support to poultry diseases surveillance, diagnosis and control
- Training and capacity building on business development, animal husbandry and health
- Support to hatchery expansion, including parent stock for broilers, guinea fowls and local chicken

Component 2: Integrated Agribusiness and Value Chain Development:

This component seeks to support actors along the value chain, particularly post-production actors. Key interventions include the promotion of quality standards for maize and soybean production, storage and processing, support the establishment of small-to-medium scale poultry processing units at district level to access financing, and enhance access to market information (e.g. quantity, quality, timing and pricing). It will support skills development for women and youth, promote entrepreneurship and mentoring programs, especially for poultry value chain. Women headed households in vulnerable communities would be supported to produce local chicken to improve their income status and help meet their nutritional requirements. Locations of infrastructure to be supported, such as poultry housing and poultry processing units for private sector is not yet determine as this is demand driven. A detailed site-specific environmental assessment will be undertaken for each private sector operation, in compliance with the environmental laws of Ghana before any support will be extended during project implementation.

Sub-component 2.1 Value Addition and SME Development

- Promotion of quality standards for rice, maize and soybean production, storage and processing
- Support business development, including improvements in business processes of existing commercial farmers
- Enhance access to market information (e.g. quantity, quality, timing and pricing)
- Promote the development of allied services (packaging, new distribution networks for poultry products, transport services, new agro-input delivery systems, etc.)
- Support and training of poultry producers on ISO 9000 & other necessary certification requirements on poultry to access premium market.
- Support to feed millers to improve feed stock and expand processing capacity
- Enhance investment facilitation and promotion to increase the number of commercial producers and processors in the Savannah regions
- Support for cold chain development for chicken

Sub-component 2.2 Youth/Women Empowerment and Nutrition

- Promote other income generating activities for women and youth, including as shea, dawadawa, mango, cashew production and processing
- Support women and youth on marketing and supply of poultry products to key institutions and programs including the school feeding program
- Capacity building for women and youth in small-scale commercial poultry business management and entrepreneurship, including mentorship.
- Promote the consumption of local poultry and eggs to improve household nutrition, and in particular maternal and child nutrition to prevent stunting
- Promote the breed improvement of local poultry through cockerel distribution program.

Component 3: Project Management and Institutional Support:

This component involves the development of annual work plan and budget, establishment of results-based monitoring and evaluation system, conducting beneficiary impact assessment and other studies. It will also include the conduct of project mid-term review, project completion reports, technical reviews, video and pictorial documentation of success stories, support to the coordination and implementation of key government flagships including Rearing for Food and Jobs and Planting (RfJ) for Food and Jobs (PfJ).

Sub-Component 3.1 Knowledge Management, Monitoring and Evaluation

- Development of annual work plan and budget
- Establishment of results-based management system for M&E
- Conduct Beneficiary Impact Assessment.
- Conduct Project Mid-Term Review.
- Conduct Project Completion/Technical Review (PCR).
- Video and pictorial documentation of success stories
- Undertake relevant studies, including socio-economic surveys, soil suitability surveys
- Development and Implementation of Environmental and Social Management Plan (ESMP)
- Enhance capacity to mobilize private sector investors in the maize-soybean-poultry industry.

Sub-component 3.2 Project Coordination

- Upgrade the project coordination unit with additional staff
- Procure vehicles for PCU, office equipment and furniture as may be required.
- Facilitate annual financial audits.
- Facilitate procurement audit.
- Facilitate Project Steering Committee (PSC) meetings.

Project Activities in the Bawku West District

The specific project activities to be implemented in the Bawku West District at the preparatory, construction and operation phases of the project implementation are:

Preparatory Phase

- Identification of potential beneficiary communities for the production of maize, soybeans and rice
- Conduct of relevant studies, including socio-economic surveys
- Development and Implementation of Environmental and Social Management Plan (ESMP)
- Request for applications and screening of applicant farmers using the following criteria:
  - ✓ Prospective farmers must be interested in the cultivation of soybean, maize and rice and should operate an out-grower or an in-grower scheme.
  - ✓ Interested farmers shall be willing to cultivate these crops under Conservation Agricultural practices.
  - ✓ Prospective farmers should own a contiguous land of not less than 100ha suitable for production with potential to expand further.
  - ✓ A substantial area of land should have been developed and prepared for farming by the prospective farmer.

- ✓ The dedicated farmland of at least 100 ha shall be made available solely for the Conservation Agriculture for the next five (5) years.
- ✓ The farm should be accessible and motorable throughout the farming season. Farms located along major roads would be an added advantage.
- ✓ Prospective farmers should own at least a tractor with implements to compliment the use of other CA equipment. Ownership of other equipment such as Boom Sprayer, No-Till planters and Fertilizer Spreaders provide great opportunity for participation.
- ✓ Prospective Farmers must show an indication of access to storage facilities for inputs and harvested grain.
- ✓ Prospective farms must be located within the Northern Savannah Ecological Zone of Ghana
- ✓ Prospective Farmers should have access to technical services (Extension agents, Mechanization operators etc.) to support farm development and management.

- Assessment of soil suitability and GIS mapping of commercial farms using ICT.

Construction Phase

- Provision of support for land development and access to mechanisation services.
- Production and promotion of certified hybrid maize and improved soybean seeds, in collaboration with seed companies.
- Promotion of climate smart agriculture, environmental conservation best practices, including use of economic trees such as shea, dawadawa, mango, cashew etc.
- Training and capacity building on business development, animal husbandry and health
- Enhance capacity to mobilize private sector investors in the maize-soybean-poultry industry

Operation Phase

- Support out-grower contractual arrangements
- Conduct surveillance and collect data on pests attacking the Maize and Soybeans in the project zones with specific reference to FAW.
- Community sensitization, Establishment of fire belts and enforcement of community fire by-laws to deal with the impact of bush fires.
- Promote the use of Nitrogen fixing inoculants to boost soybean yield
- Promotion of quality standards for rice, maize and soybean production, storage and processing
- Support business development, including improvements in business processes of existing commercial farmers
- Enhance access to market information (e.g. quantity, quality, timing and pricing)
- Promote the development of allied services (packaging, new distribution networks for poultry products, transport services, new agro-input delivery systems, etc.)
- Support to feed millers to improve feed stock and expand processing capacity
- Enhance investment facilitation and promotion to increase the number of commercial producers and processors in the Savannah regions
- Promote other income generating activities for women and youth, including shea, dawadawa, mango, cashew production and processing
- Support women and youth on marketing and supply of poultry products to key institutions and programs including the school feeding program
- Capacity building for women and youth in small-scale commercial poultry business management and entrepreneurship, including mentorship.

3.0 ANALYSIS OF ALTERNATIVES

3.1 Options for Consideration

The proposed project considered some feasible options in respect of their potential environmental and social impacts. These are analysed in **Table 3-1** and include:

- Cropping system;
- Rice production system;
- Type of irrigation;
- Power supply;
- Sources of water;
- Waste management; and
- No option.

Table 3- 1: Analysis of Alternative Project Options

Option/ Method of Deployment	Potential Environmental, Social, Technological and Economic Implications		Preferred Option
Cropping system			
1. Mono-cropping	**Advantages** 1. Growing one type of crop all year round on the same land. 2. Allows large expanses of land to be cropped and harvested at the same time. 3. Easier to be mechanized. 4. Less types of equipment and machinery required.	**Disadvantages** 1. Higher risk of crop failure due to pest and disease infestation or drought. 2. Higher risk of investment loss due to crop failure. 3. Higher rate of nutrient depletion due to the same nutrient requirement.	**Option 1, Mono cropping is considered as the preferred option due to the large expanse of land and ease of mechanization**
2. Mixed Cropping	**Advantages** 1. Growing of two or more crops on different portions of the same land. 2. Spreads risk of crop failure. 3. Diversifies sources of income.	**Disadvantages** 1. Different maturity periods of crops affect planning. 2. Different requirements of plants require different types of equipment, fertilizers and other farm inputs.	
Rice production system			
1. Upland production	**Advantages** 1. Grown in rain-fed naturally well-drained soils 2. Plants have less exposure to alterations between aerobic and anaerobic environments	**Disadvantages** 1. It is largely for subsistence production 2. Soils are usually nutrient deficient 3. Have lower yield	**Option 1, Mono cropping is considered as the preferred option due to the large**

Option/ Method of Deployment	Potential Environmental, Social, Technological and Economic Implications		Preferred Option
	3. Rice varieties are drought tolerant	4. Susceptible to weed invasion and diseases	
2. Lowland valley production	**Advantages** 1. Fields can be flooded either by rainfall or irrigation 2. Lowland soils are usually fertile 3. Suitable for commercial production 4. Has higher yields	**Disadvantages** 1. Water level cannot be controlled exposing crops to serious floods or drought 2. Crops are exposed to alterations between aerobic and anaerobic environments	**Option 2, Lowland valley production is the preferred option due to its higher yields and suitability for commercial production**
Type of irrigation			
1. Surface irrigation (flood and furrow irrigation methods)	**Advantages** 1. Surface irrigation is one of the most common types of irrigation systems. 2. Uses the force of gravity to distribute the water, which is meant to then seep into the soil. 3. Less costly compared to other irrigation systems 4. Suitable for high water demand crops. 5. Can be used in windy conditions.	**Disadvantages** 1. Not suitable for crops which are sensitive to flooding.	**Option 3, Drip irrigation is preferred as it is water efficient and can be installed in any type of landscape**
2. Sprinkler irrigation	**Advantages** 1. High application efficiency 2. Can be combined with fertilizer application. 3. Can be applied at areas with variable topography.	**Disadvantages** 1. Water can be lost because of high winds or evaporation. 2. Irrigating the entire field uniformly can be difficult or tedious if the system is not properly designed 3. Water remaining on plants' leaves may promote fungal and other diseases. 4. If fertilizers are included in the irrigation water, plant leaves	

Option/ Method of Deployment	Potential Environmental, Social, Technological and Economic Implications		Preferred Option
		can be burned, especially on hot, sunny days.	
3. Drip Irrigation	**Advantages** 1. Consideration for vegetable crops, but requires pumping from laterals to storage tanks into a piped system. Can be done but needs full and multiple farmer cooperation 2. Water is delivered at or near the root zone of plants, drop by drop. 3. In modern agriculture, drip irrigation is often combined with plastic mulch, further reducing evaporation. 4. High efficiency of fertilizer application. 5. This method can be the most water-efficient method of irrigation, if managed properly, since evaporation and runoff are minimized.	**Disadvantages** 1. Very costly compared to other irrigation systems. 2. Requires highly skilled labour in design, installation and operation. 3. Highly sensitive to clogging.	
Power supply			
1. National grid	**Advantages** 1. The cost of electricity is low decreasing production cost	**Disadvantages** 1. Unreliable power supply from frequent power cuts	**Solar energy installations (Option 2) such as solar powered pumps are preferred for the pump irrigation.**
2. Solar energy installations	**Advantages** 1. Presents a clean and sustainable source electricity 2. Low operational costs 3. Meets the objective of Technology transfer and climate friendliness	**Disadvantages** 1. Expensive capital cost	
Sources of Water			
1. Groundwater	**Advantages** 1. Relatively reliable source all year round	**Disadvantages** 1. Expensive to access and abstract	**Option 2, which is the use of surface water appears to be**

Option/ Method of Deployment	Potential Environmental, Social, Technological and Economic Implications		Preferred Option
	2. Seasonal variations are minimal 3. Relatively stable water quality	2. Challenges of over-exploitation to meet high demands and associated threat of land subsidence 3. May require farms of boreholes to meet demand 4. Threat of high iron and fluoride concentration in aquifers in the northern parts of the country	**the most preferred option as it will be easier to implement water management plans**
2.Surface water	**Advantages** **1.** Easier to abstract and use	**Disadvantages** 5. Seasonal variations in flow **6.** Vulnerable to pollution	
3.Rain harvesting	**Advantages** 1. Easy to trap and store	**Disadvantages** 1. Source is unreliable 2. Evaporation losses are high in the dry months of the year	
Waste Management Option			
1. Composting plant	**Advantages** 1. Improvements in soil quality. 2. Enhances the structure of the soil. 3. Eco-friendly. 4. Fully organic fertilizer. 5. Higher yields.	**Disadvantages** 1. Requires initial investment. 2. Efficiency depends on the amount of organic waste 3. May attract rats, snakes, and bugs. 4. Requires space 5. Unpleasant smell	**Option 1, composting is a better option as it is ecofriendly and could be used to improve soil quality on farms. It will also keep waste away from landfill, which already have limited space.**
2. Municipal Waste Dump/ landfill sites	**Advantages** 1. Straightforward concept to deal with waste. 2. Filled land can be reused for other community purposes. 3. Landfills can prevent environmental dumping.	**Disadvantages** 1. Completed landfill areas can settle and requires maintenance. 2. Requires proper planning, design, and operation.	

Option/ Method of Deployment	Potential Environmental, Social, Technological and Economic Implications		Preferred Option
	4. Good for waste that is non-recyclable.	3. Can contribute to groundwater pollution. 4. Landfills can be a breeding ground for bacteria.	
No Option			
	Advantages 1. Funds for the project implementation could be used for solving other development problems, albeit less dire	**Disadvantages** 1. Non implementation of the project will continue to deprive project communities of access to economic opportunities and food security associated with agriculture. Also, locals who would have been offered employment will continue environmentally unfriendly livelihood activities such as felling of trees for charcoal, game hunting leading to bushfires etc. 2. Government will lose revenue and the opportunity to leverage import substitution for economic growth.	**This option is not preferable**

4.0 POLICY, LEGAL AND REGULATORY FRAMEWORK

National and sector legislation and policies relevant to the agriculture sector have been reviewed in this section. Also, institutional requirements, international conventions, AfDB safeguard policies, and national environmental quality guidelines for the management of environmental and social issues have been considered. These have been summarized in **Table 4-1** under the following themes:

- Policies and Plans
- National legal framework;
- Agriculture sector legislation and related requirements;
- Local governance, planning and other institutional requirements;
- Public Health, Safety, Security and Social Protection;
- Environmental legislation in Ghana;
- African Development Bank safeguard policies; and
- International conventions.

4.1 Policies and Plans

The policies and plans reviewed and applied in the assessment include:

- Ghana Shared Growth and Development Agenda, 2010;
- National Environmental Policy, 2012;
- National Land Policy, 1999;
- National Water Policy, June 2007;
- National Climate Change Policy, 2013;
- National Gender Policy, 2015;
- Riparian Buffer Zone Policy, 2014;
- National Irrigation Policy, June 2010;
- Food and Agriculture Sector Development Policy, FASDEPII (MOFA);
- National Environmental Action Plan/Policy, 1994; and
- National Employment Policy, 2012

Table 4- 1: Relevant Legal Framework and Key Compliance Requirements

No.	Policies and Plans	Applicability to Proposed Project
1.	**Ghana Shared Growth and Development Agenda, 2010** It provides for the Vision for the Agricultural, Environment and Natural Resource Sectors in Chapter four. The main focus of the agricultural sector is to accelerate the modernization of agriculture and ensure its linkage with industry through the application of science, technology and innovation. The modernized agriculture sector is expected to underpin the transformation of the economy through job creation, increased export earnings, food security, and supply of raw materials for value addition and rural development as well as significant reduction in the incidence of poverty.	The SADP is in accord with the focus of the policy.
2.	**National Environmental Policy, 2012**	The proposed project seeks to promote sustainable

No.	Policies and Plans	Applicability to Proposed Project
	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.	development by including economic, social and environmental considerations.
3.	**National Land Policy, 1999** 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.	The project sites will not be in protected areas, forests or wildlife estate. The implementation of the project will conform to the environmental laws of the country which includes, registration with EPA, Preliminary Environmental and Social Assessment and obtaining an environmental permit prior to commencement.
4.	**National Water Policy, 2007** 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: (i) encouraging efficient use of fertilizers to reduce pollution of water bodies and ensure conservation of water, and (ii) promoting and encouraging water use efficiency techniques in agriculture and reducing transmission losses of water in irrigation systems.	The project's Environmental and Social Management Plan (ESMP) must include mitigation measures against over-exploitation of water resources and also against water pollution which emanate from agrochemicals and unsustainable agricultural practices. The irrigation designs must include water use efficiency techniques especially for the chosen crops".
5.	**National Environmental Action Plan/Policy, 1994** 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.	The design and implementation of the proposed project will take into consideration measures to promote the sustainable use of natural resources and ensure environmental management.

No.	Policies and Plans	Applicability to Proposed Project
6.	**National Employment Policy, 2012** The National Employment Policy indicates that poverty is still high at about 28.5 percent and that there is a strong correlation between the employment situation and poverty. The policy states that the key source of demand for labour emanates from the productive sectors of the economy, namely, agriculture, industry and service. One of the key strategies of the employment policy is to *promote farm and non-farm rural employment through modernization of agriculture, improving the productivity of farmers and contract farming arrangements, promoting effective linkages between farm and non-farm activities among others*.	The proposed project is consistent with the strategy of the employment policy to promote farm and non-farm rural employment.
7.	**National Gender Policy, 2015** 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.	The project will not discriminate against women and the vulnerable in the local communities. The criteria for selecting beneficiary farmers will consider gender and disability
8.	**National Climate Change Policy, 2013** 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. Under the Agriculture and Food Security area, the key objectives are: ▪ Develop climate-resilient agriculture and food systems for all agro-ecological zones; and ▪ Develop human resource capacity for climate-resilience. The key actions to achieve these objectives which are related to the proposed project include: ▪ Develop climate-resilient cropping and livestock systems as well as crop varieties and livestock breeds tolerant to flooding, drought and salinity; ▪ Promote appropriate technologies for small-scale irrigation, water re-use and water harvesting; and ▪ Improve post-harvest capacity, e.g., storage and processing facilities and infrastructure.	The climate-resilient technology to be adopted for the proposed project includes use of improved seed varieties and irrigation systems. The project will develop human resource capacity to adapt to changing climate as part of the modernisation of the scheme. and improve post-harvest management through the provision of storage and processing facilities and infrastructure
9.	**Buffer Zone Policy, 2011** 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. The recommended buffer widths provided in the Policy include: ▪ Minor perennial streams: 10 to 20 meters; and ▪ Important seasonal streams: 10 to 15 meters.	The project will ensure that the necessary buffer distances are observed on project sites to preserve water bodies. Also, the setback distances provided for the water pollution hazards will be applied in the siting of storage facilities for

No.	Policies and Plans	Applicability to Proposed Project
	The Policy also designates the following as water pollution hazards and must be setback from any stream or water body by the following distances: ▪ Storage of hazardous substances – 45 meters ▪ Raised septic systems – 75 meters ▪ Solid waste landfills – 90 meters	agrochemicals, septic systems and waste bins.
10.	**National Irrigation Policy, 2010** The objective of irrigation policy is to expand and improve the efficiency of irrigation to support agricultural development and growth. It will be pursued with principles of sustainability in operation and maintenance, and use of natural resources, equitable access by women to benefits of irrigation, and the rights to participate in irrigation management. The targets of the Ghana Irrigation Policy are to attain national food security, increase livelihood options, intensify and diversify production of agricultural commodities.	The proposed project involves the setting up of irrigation systems. The beneficiary farmers will have access to the irrigation systems to increase their productivity and enhance their livelihoods.
11.	**Food and Agriculture Sector Development Policy (FASDEP)** The revised FASDEP of 2006 (FASDEP II) emphasizes the sustainable utilization of all resources and commercialization of activities in the sector with market-driven growth in mind and with emphasis on environmental sustainability. The Medium Term Agriculture Sector Investment Plan (METASIP) developed to implement FASDEP II over the medium term 2011-2015 includes the following programmes: ▪ Food security and emergency preparedness; ▪ Improved growth in incomes; ▪ Increased competitiveness and enhanced integration into domestic and international markets; ▪ Sustainable management of land and environment; and ▪ Science and technology applied in food and agriculture development	The project will significantly advance the achievement of the FASDEP objectives through improved efficiency and management of the scheme. The project will ensure sustainable utilization of resources and sustainable land and environmental management including through the use of a more efficient irrigation system.

4.2 National Regulatory Framework

The regulatory areas reviewed and applied in the assessment in compliance with national requirements include:

- The Constitution of the Republic of Ghana, 1992;
- Ghana Investment Promotion Centre Act 1994, Act 478;
- Environmental Protection Agency Act 1994, Act 490;
- Environmental Assessment Regulations 1999, LI 1652
- Fees and Charges (Amendment) Instrument, 2019 (LI 2386);
- Water Resources Commission Act 1996, Act 522;
- The Water Use Regulations 2001, LI 1692;
- Ghana Meteorological Agency Act 2004, Act 687.

No.	Legal Framework and Key Compliance Requirements	Applicability to Proposed Project
12.	**The Constitution of the Republic of Ghana, 1992** The Constitution includes some provisions to protect the right of individuals to private property and also sets principles under which citizens may be deprived of their property in the public interest (described in Articles 18 and 20). Article 18 provides that "Every person has the right to own property either alone or in association with others." In Article 20, the Constitution describes the circumstances under which compulsory acquisition of immovable properties in the public interest can be done. It includes: • the development or utilization of property for public benefit • reasonable justification is provided for acquisition • the prompt payment of fair and adequate compensation • resettlement of displaced persons on suitable alternative land with due regard for their economic well-being, social and cultural values.	This is the overarching legislative framework of Ghana. Articles 18 and 20 provides conditions for the acquisition of property (in this case land) for development projects and compensation
13.	**Ghana Investment Promotion Centre Act 1994, Act 478** The Ghana Investment Promotion Centre Act 1994 (Act 478) requires that every investor wishing to invest in the country must in its appraisal of proposed investment projects or enterprises, "…have regard to any effect the enterprise is likely to have on the environment and measures proposed for the prevention and control of any harmful effects to the environment...".	The proposed project has environmental impacts and measures have been proposed in the ESIA/ESMP to address the impacts.
14.	**Environmental Protection Agency (EPA) Act 1994, Act 490** 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.	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, considering that project area is in an environmentally sensitive area according to EPA classification, a permit has to be obtained
15.	**Environmental Assessment Regulations 1999, LI 1652** The Environmental Assessment Regulations 1999 (LI 1652) enjoins any proponent or person to register an 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.	The SADP will be guided by LI 1652 including registering sub-projects with the EPA and obtaining an environmental permit.
16.	**Fees and Charges (Amendment) Instrument, 2019 (LI 2386)** The Fees and Charges (Amendment) Instrument, 2019 (LI 2386) sets out the fee regime for processing and environmental permits, associated with the Environmental Assessment Regulations 1999, (LI 1652). The Environmental Assessment (Amendment) Regulations, 2014 (LI 2216) has been replaced by this new instrument.	Processing and permit fees are required for initial registration, submission of ESIA report and registration of sub-projects.

No.	Legal Framework and Key Compliance Requirements	Applicability to Proposed Project
17.	**Water Resources Commission (WRC) Act 1996, Act 522** The Water Resources Commission Act, 1996 (Act 522) 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 pollutes 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.	The proposed project will involve sourcing water from surface and groundwater. The appropriate authorization will be sought from the WRC prior to the commencement of work
18.	**Water Use Regulations 2001, LI 1692** 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 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.	Project managers will ensure the continuous renewal of water use permits through the appropriate tariff setting and compliance with permit requirements
19.	**Ghana Meteorological Agency 2004, Act 687** This Act establishes the Ghana Meteorological Agency, which replaces the Meteorological Services Department. The Agency is to provide meteorological information, advice, and warnings for the benefit of agriculture, civil and military aviation among others to mitigate the effects of natural disasters such as floods, storms and droughts on socio-economic development and projects. The Agency is to provide the accurate data on climatic which are relevant for establishing climate change trends.	The project managers will liaise with the Ghana Meteorological Agency regularly especially in seeking meteorological information and advice

4.3 Agriculture Sector Legislation and Related Requirements

The agriculture sector legislation reviewed include:

- The Irrigation Development Authority Regulations, 1987 (L.I. 1350)
- Irrigation Development Authority (Irrigation Water Users Association) regulations, 2016 (LI 2230);
- Plants and Fertilizer Act 2010 (Act 803);

No.	Legal Framework and Key Compliance Requirements	Applicability to Proposed Project
20.	**The Irrigation Development Authority Regulations, 1987 (L.I. 1350)** The regulations provide procedures for managing irrigation projects including water management within such projects. Ghana Irrigation Development Authority's (GIDA) Technical Guidelines for Irrigated Agriculture, 2004, gives further details on how to effectively manage water	The SMEs will be guided by the procedures outlined in the regulations

No.	Legal Framework and Key Compliance Requirements	Applicability to Proposed Project
	for irrigated agriculture including water supply, distribution and application management.	
21.	**Irrigation Development Authority (Irrigation Water Users Association) regulations, 2016 (LI 2230)** LI 2230 proposes that persons who use irrigation water and are not less than fifteen in number may form an association after those persons have set up a provisional initiative team to identify the service area of the proposed association and a founders' committee, which may not exceed twelve potential members of the association. Persons who qualify to form the association are those who possess land on the basis of landholding system and use the land with water supplied from the irrigation infrastructure. The regulation is applicable associations formed on government irrigation infrastructure. The management body of the association shall include the General Assembly, Management Committee, Oversight Committee and Dispute Settlement Committee.	SADP will establish irrigation systems and is therefore bound by the requirements of the regulation.
22.	**Plants and Fertilizer Act 2010 (Act 803)** The Act provides for the efficient conduct of plant protection to prevent the introduction and spread of pests and diseases, to regulate imports and exports of plants and planting materials; the regulation and monitoring of the exports, imports and commercial transaction in seeds and related matters; and control and regulation of fertilizer trade.	The Plant Protection Regulatory Services Division (PPRSD) of MoFA will ensure that all seeds/plant materials are safe and also put in monitoring mechanism to prevent the spread of pests and diseases from the project site to other parts of the country.

4.4 Local Governance and Planning Requirements

The relevant legislation reviewed include:

- Local Governance Act, 2016 (Act 936);
- National Building Regulations, 1996 (LI 1630);
- The State Lands Act, 1962 (Act 125);
- Lands Commission (LC) Act 2008, Act 767;
- Land Use and Spatial Planning Act, 2016 (Act 925); and

No.	Legal Framework and Key Compliance Requirements	Applicability to Proposed Project
23.	**Local Governance Act, 2016 (Act 936)** This Act establishes and regulates the local government system and gives authority to the 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 Urban/Feeder Roads and Physical Planning Departments.	The input of the Physical Planning and Roads Departments of the District Assemblies will be sought in designing water distribution networks
24.	**National Building Regulations, 1996 (LI 1630)** 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	The project will involve development of agricultural infrastructure such as sheds, storage, hatcheries etc. and the

No.	Legal Framework and Key Compliance Requirements	Applicability to Proposed Project
	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.	necessary building permit will be acquired.
25.	**The State Lands Act, 1962 (Act 125)** The Act 125 vests the authority to acquire land for the public interest in the President of the Republic. It also gives responsibility for registering a claim on the affected person or group of persons, and provides details of the procedure to do this. The State Lands Act, 1962 provides some details to be taken into consideration when calculating compensation such as definitions for cost of disturbance, market value, replacement value, and so on.	The project does not involve resettlement. However, in the event of any form of displacement or disturbance, due process will be followed in accordance with relevant provisions of this Act
26.	**Lands Commission (LC) Act, 2008 (Act 767)** The Lands Commission Act 2008 re-establishes the Lands Commission to integrate the operations of public service land institutions in order to secure effective and efficient land administration to provide for related matters. The objectives of the Commission are to (i) promote the judicious use of land by the society and (ii) ensure that land development is in conformity with the nation's development goals.	The SADP will be implemented in line with the objectives of the Commission for sustainable development of land and conform to the development goals of the MMDAs.
27.	**Land Use and Spatial Planning Act, 2016 (Act 925)** 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.	The SADP project design will be guided by planning schemes and local plan guides developed by the Land Use and Spatial Planning Departments/District Assemblies

4.5 National Labour, Environmental Quality, Health, Safety and Social Guidelines

The reviewed legislation includes:

- Labour Act, 2003 (Act 651);
- Occupational Safety and Health Policy of Ghana (Draft, 2004);
- Workmen's Compensation Law, 1987 (PNDCL 187);
- National Workplace HIV/AIDS Policy;
- Ghana Standard for Environmental Protection - Requirements for Effluent Discharge (GS1212, 2019);
- Ghana Standards for Environment and Health Protection - Requirements for Ambient Air Quality and Point Source/Stack Emissions (GS 1236, 2019);
- Ghana Standards for Health Protection - Requirements for Ambient Noise Control (GS 1222, 2018);
- Ghana Standards for Environment and Health Protection - Requirements for Motor Vehicle Emissions (GS1219, 2018);
- Factories, Offices and Shops Act, 1970 (Act 328);
- Water Resources Commission (WRC) Act 1996, Act 522;
- Ghana National Fire Service Act, 1997 (Act 537);
- Fire Precaution (Premises) Regulations, 2003 (LI1724).

No.	Legal Framework and Key Compliance Requirements	Applicability to Proposed Project
28.	**Labour Act, 2003 (Act 651)** 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*".	Construction activities could result in injuries and fatalities. HSE issues have been duly assessed and provided for in the proposed ESMP for the project
29.	**Occupational Safety and Health Policy of Ghana (Draft, 2004)** The statement of the Occupational Safety and Health Policy of Ghana (Draft, 2004) is: 'to prevent accidents and injuries arising out of or linked with or occurring in the course of work, by minimising as far as reasonably practicable the cause of the hazards in the working environment and, therefore the risk to which employees and the public may be exposed'. The policy is derived from provisions of the International Labour Organisation (ILO) Conventions 155 and 161. The policy document highlights specific strategies, activities promotion and awareness creation which ensure that workers engaged at the construction and operation stages of the project are protected.	Potential sources of accidents and injuries that could occur in the course of work, have been identified and incorporated into safeguards for minimising safety and health risks and hazards as required by the draft OSH Policy.
30.	**Workmen's Compensation Law, 1987 (PNDCL 187)** 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.	The Labour policy and employment contracts will provide for workmen compensation in the event of injury.
31.	**National Workplace HIV/AIDS Policy** 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.	The project duration will be short-term and use just a few migrant workers. This will reduce the potential for HIV spread but an HIV policy will be provided as required by the national policy
32.	**Ghana Standard for Environmental Protection - Requirements for Effluent Discharge (GS1212, 2019)** 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.	Effluent from both construction and operation phases will be managed as specified in the proposed ESMP
33.	**Ghana Standards for Environment and Health Protection - Requirements for Ambient Air Quality and Point Source/Stack Emissions (GS 1236, 2019)** 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.	Dust and vehicular emissions will be controlled as specified in the proposed ESMP
34.	**Ghana Standards for Health Protection - Requirements for Ambient Noise Control (GS 1222, 2018)**	Noise generated at both the construction and operation stages

No.	Legal Framework and Key Compliance Requirements	Applicability to Proposed Project
	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	will be monitored as stated in the proposed ESMP to ensure it does not exceed acceptable limits
35.	**Ghana Standards for Environment and Health Protection - Requirements for Motor Vehicle Emissions (GS1219, 2018)** 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 (such as combine harvester, etc.), mobile industrial / construction machines (such as excavators).	Vehicles for transportation of materials and workers will produce fumes but will be managed with regular maintenance as stipulated in the proposed ESMP
36.	**Factories, Offices and Shops Act, 1970 (Act 328)** 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 workers.	Warehouses for storage of materials and project offices will be registered with the FID. Accidents/incidents will be captured in the HSE policy. Also, relevant safety notices will be posted at vantage points.
37.	**Ghana National Fire Service Act, 1997 (Act 537)** 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.	The project area is prone to bushfires so the Fire Service will be engaged to provide education/sensitization on fire prevention and fighting.
38.	**Fire Precaution (Premises) Regulations, 2003 (LI1724)** 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 warehouses and project offices.
39.	**The Fire Precaution (Premises) Regulations 2003, LI 1724** The Fire Precaution (Premises) Regulations 2003 (LI 1724) requires all premises intended for use as workplaces to have Fire Certificates and confers enforcement powers on the Ghana National Fire Service (GNFS) to demand a fire certificate for premises that are put to use as a place of work.	Fire certificates will be obtained for warehouses and project offices.
40.	**Control of Bush Fires Law of 1983 (PNDCL 46)** It seeks to control the setting of bushfires by criminalizing the intentional, reckless, or negligent causing of such fires and holding the offender liable for all consequences of the fire.	Bushfire is a risk to the proposed project and will be guided by these Laws to take lawful action against any such offender.
41.	**Control and Prevention of Bushfire law, PNDCL 229**	

No.	Legal Framework and Key Compliance Requirements	Applicability to Proposed Project
	Section 2 defines "starting of a bushfire". A person starts a bushfire if an action of that person results in the uncontrolled burning of a farm, forest or grassland. The Chief Conservator of Forests or the Chief Game and Wildlife Officer may authorize starting of fires by authorized officers in Conservation Areas under section 4.	
42.	**The Children's Act 1998, Act 560** The Act spells out the rights of the child, quasi-judicial/judicial child adjudication, parentage /custody/access/maintenance, fosterage/ adoption and employment of children issues. The Act defines a child as a person below the age of 18 years. The minimum age for admission of a child to employment is fifteen years and the minimum age for the engagement of a person in hazardous work is eighteen years. No person shall engage a child in exploitative labour and labour is exploitative of a child if it deprives the child of its health, education or development.	SADP will be guided by this Act in the employment of labour for the proposed project and will ensure all labour engaged by the Contractors are not below the minimum age.
43.	**Alternative Dispute Resolution Act 2010 (Act 798)** The purpose of the Act is to "…provide for the settlement of disputes by arbitration, mediation and customary arbitration, to establish an Alternative Dispute Resolution Centre and to provide for related matters." The Act further defines Alternative Dispute Resolution "as the collective description of methods of resolving disputes otherwise than through the normal trial process" (Section 135). The ADR Act covers both domestic and international arbitration in Ghana and the enforcement of both domestic and foreign arbitral awards within the jurisdiction.	SADP will ensure that the alternative dispute resolution option is used to address disputes and conflicts instead of the more expensive and time-consuming legal court system under this project.

4.6 Institutional Framework

The stakeholder institutions identified include:

- Ministry of Food and Agriculture;
- Ghana Irrigation Development Authority;
- Irrigation Company of Upper Region Limited (ICOUR);
- Water Resources Commission;
- Lands Commission;
- Environmental Protection Agency;
- Local Government Authority; and
- Traditional Authorities.

No.	Institutional Framework and Key Implementation Responsibilities for the project in general and subprojects	Roles and responsibilities in implementing project's ESMP
1.	**Ministry of Food and Agriculture (MOFA)** MOFA promotes sustainable agriculture and agribusiness through research and technology development, effective extension and other support services to farmers, processors, and traders for improved human livelihood. The Food and Agriculture Sector Development Policy (FASDEP II) and the Medium Term Agricultural Sector Investment Plan (METASIP) seeks to guide development and interventions in the agriculture sector. The Savanna Agricultural Value Chain Development Project (SADP) of MoFA also seeks to develop agriculture in Ghana in line with the country's efforts at poverty reduction and ensuring food security by promoting inclusive commercial farming along selected commodity value chains.	Regional and District Departments of Agriculture have the mandate of offering extension services and support to ensure sustainability and the successful implementation of the project
2.	**Ghana Irrigation Development Authority (GIDA)** GIDA is a semi-autonomous agency of MOFA which was established by the Supreme Military Council Decree 85 (SMCD) of 1977 to explore all water resources for livelihood options in agriculture at appropriate scales for all communities. Its functions include formulating, developing and implementing irrigation and drainage plans for all year round agriculture production, livestock and fish culture in Ghana. Currently, its services and activities comprise: ▪ Developing design standards for irrigation infrastructure; ▪ Designing irrigation infrastructure and related facilities e.g. dams, ponds, and tube-wells, conveyance structures; ▪ Carrying out land-use planning in areas earmarked for irrigation development; ▪ Providing public irrigation facilities; ▪ Providing technical services for the development of irrigation facilities; ▪ Providing technical and managerial services for effective use of irrigation facilities; and ▪ Developing and disseminating adaptive irrigation technology.	GIDA will provide technical advice on the design and installation of the irrigation system.
3.	**Water Resources Commission (WRC)** WRC was established by an Act of Parliament (Act 522 of 1996) with the mandate to regulate and manage Ghana's Water Resources and co-ordinate government policies in relation to them. The Act stipulates that ownership and control of all water resources are vested in the President on behalf of the people, and clearly defines the WRC as the overall body responsible for water resources management in Ghana. The functions of the WRC as established under Act 522 among other things are to: ▪ Formulate and enforce policies in water resources conservation, development and management in the country;	SADP must obtain water use permit from WRC and collaborate with the WRC in the protection of water bodies

No.	Institutional Framework and Key Implementation Responsibilities for the project in general and subprojects	Roles and responsibilities in implementing project's ESMP
	▪ Coordinate the activities of the various agencies (public and private) in the development and conservation of water resources; ▪ Enforce, in collaboration with relevant agencies, measures to control water pollution; and ▪ Be responsible for appraising water resources development project proposals, both public and private, before implementation.	
4.	**Local Government Authority** The Regional Coordinating Council (RCC) and the Metropolitan /Municipal/District Assemblies (MMDAs) are responsible for the overall development of the region and metropolis/municipality/district respectively. Acts 462 and 480, which established the current district assembly structure, designate the District/Municipal/Metropolitan Assembly as the planning authority, charged with the overall development of the district. With regard to environmental management at the district level, the District Environmental Management Committees (DEMC) has been set up by law (Act 462) to among other things: ▪ promote and provide guidelines for the establishment of community-level environmental committees to put into effect the environmental programmes of the Assembly in the community; and Plan and recommend to the DA, strategies and activities for the improvement and protection of the environment with emphasis on fragile and sensitive areas, river courses etc.	The project is located in the Bawku West District and will be influenced by decisions and plans of the Upper East Regional Coordinating Council and the identified Assembly. The Assembly will play key roles in the successful implementation and related activities of the project.
5.	**Lands Commission** The Lands Commission was established by Article 258 of the 1992 Constitution and the Lands Commission Act, 2008 (Act 767). The functions of the Lands Commission include amongst others; ▪ advise the Government, local authorities and traditional authorities on the policy framework for the development of particular areas of the country to ensure that the development of individual pieces of land is coordinated with the relevant development plan for the area concerned; ▪ ensure that through sound, sustainable land use planning, socio-economic activities are consistent with sound land use through sustainable land use planning in the long-term national development goals; and promote community participation and public awareness at all levels in sustainable land management and development practices to ensure the highest and best use of land.	The SADP will be implemented in line with the objectives of the Commission for sustainable development of land and conform to the development goals of the MMDAs.
6.	**The Forestry Commission (FC)** The Forestry Commission Act, 1999 (Act 571) makes the FC responsible for the regulation of utilization of forest and wildlife resources, the conservation and	Implementation of the SADP will involve clearing of some trees as part of land preparation, This activity will be guided by the requirements of the FC

No.	Institutional Framework and Key Implementation Responsibilities for the project in general and subprojects	Roles and responsibilities in implementing project's ESMP
	management of those resources and the coordination of policies related to them. The Commission embodies the various public bodies and agencies that were individually implementing the functions of protection, management, the regulation of forest and wildlife resources.	
7.	**Environmental Protection Agency** The EPA is the body responsible for regulating the environment and ensuring the implementation of government policies on the environment. The functions of the Agency include: ▪ ensuring compliance with any laid down environmental impact assessment procedures in the planning and execution of development projects, including compliance in the respect of existing projects; ▪ promoting effective planning in the management of the environment; ▪ imposing and collecting environmental protection levies in accordance with the Environmental Protection Agency Act 1994, Act 490 or regulations made under the Act; and ▪ acting in liaison and co-operation with government agencies, District Assemblies and other bodies and institutions to control pollution and generally protect the environment.	SADP will follow and abide by all EPA procedures in the implementation of the project.
8.	**Local Government Authority** The Regional Coordinating Council (RCC) and the Metropolitan /Municipal/District Assemblies (MMDAs) are responsible for the overall development of the region and metropolis/municipality/district respectively. Acts 462 and 480, which established the current district assembly structure, designate the District/Municipal/Metropolitan Assembly as the planning authority, charged with the overall development of the district. With regard to environmental management at the district level, the District Environmental Management Committees (DEMC) has been set up by law (Act 462) to among other things: ▪ promote and provide guidelines for the establishment of community-level environmental committees to put into effect the environmental programmes of the Assembly in the community; and ▪ Plan and recommend to the DA, strategies and activities for the improvement and protection of the environment with emphasis on fragile and sensitive areas, river courses etc.	The project is located in the Bawku West District and will be influenced by decisions and plans of the Upper East Regional Coordinating Council and the identified Assembly. The Assembly will play key roles in the successful implementation and related activities of the project.

No.	Institutional Framework and Key Implementation Responsibilities for the project in general and subprojects	Roles and responsibilities in implementing project's ESMP
9.	**Traditional Authorities** In Ghana, people of common descent owe allegiance to a symbol of collective authority, such as the 'stool' for the Akans of southern Ghana or the 'skin' for the northern peoples. Traditional authorities play a role in the administration of the area. At the village level, family and land disputes and development issues are also traditionally dealt with by the village chief and elders. In addition to providing an important leadership role, especially in the more rural areas, chiefs act as custodians of stool/skin land, can mobilise their people for developmental efforts and arbitrate in the resolution of local disputes. Although chiefs have no direct political authority, some are appointed by the Government or District Assemblies.	The proposed project site falls under the Bawku Traditional Council that is a key stakeholder in the project.

4.7 International Conventions

Ghana is a signatory to some of the international conventions that are relevant to the proposed project and it is imperative to analyse the project in light of the commitments made under such conventions. The relevant international conventions are summarised below.

No.	Legal Framework and Key Compliance Requirements	Ratification Date	Applicability to Proposed Project
1.	**United Nations Convention on Biological Diversity** The three goals of the CBD are to promote the conservation of biodiversity, the sustainable use of its components, and the fair and equitable sharing of benefits arising out of the utilization of genetic resources. The convention calls for the adoption of national strategies, plans and programmes for the conservation and sustainable use of biological diversity into their relevant sectoral and cross-sectional plans, programmes and policies. One of the tools that are prescribed for the management of biodiversity is an environmental assessment. Article 14 of the convention deals with impact assessment and minimization of adverse impacts.	29 August 1994	Ghana is a signatory to these international conventions which are also are relevant to the proposed project. The proposed project has potential impacts on biodiversity and will have to implement appropriate climate change adaptation measures. Ghana, being a signatory of these conventions, will work towards the achievement of the respective goals of these conventions. The ESIA will identify endangered species in the project area and recommend appropriate mitigation measures for their protection and conservation.
2.	**Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)**	14 November 1975	Species such as rosewood, which is listed on CITES, could

No.	Legal Framework and Key Compliance Requirements	Ratification Date	Applicability to Proposed Project
	The objective of the Convention is to conserve wildlife and prevent international trade from threatening species with extinction.		be affected by project activities such as land clearing. The ESIA will identify endangered species in the project area and recommend appropriate mitigation measures for their protection and conservation.
3.	**United Nations Framework Convention on Climate Change (UNFCCC)** The UNFCCC provides the basis for global action to protect the climate system for present and future generations. The ultimate objective of this Convention and any related legal instruments that the Conference of the Parties may adopt is to achieve, in accordance with the relevant provisions of the Convention, stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a time frame sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner.	06 September 1995	The SADP is a government agricultural initiative and is therefore bound by the requirements of the regulation.

4.8 African Development Bank Operational Safeguards

The African Development Bank (AfDB) has published Operational Safeguards (OSs) to guide the safe development of projects it is funding. The triggered policies are described in the **Table 4-2** below. The AfDB requirements are not inconsistent with the national requirements and therefore no implementation conflicts are foreseen.

Table 4- 2: Operational Safeguards of the AfDB

No.	AfDB Operational Safeguard Policy	Summary of core requirements	Potential for Trigger under proposed project	Applicability to proposed project
1.	OS1– Environmental and social assessment	Borrowers or clients are responsible for conducting the environmental and social assessment (Strategic Environmental and Social Assessment, or SESA, or Environmental and Social Impact Assessment, or ESIA) and for developing, as an integral part of project documentation, an appropriate plan for managing possible impacts. It categorises proposed projects into categories 1, 2, 3, 4 and 5 based on the extent of adverse impacts anticipated from the project.	Triggered	OS1 is triggered because SADP will be based on the development and rehabilitation of agriculture infrastructures, which may pose environmental and social risks. SADP risks will be managed throughout the implementation of mitigation measures prescribed in the site specific ESMPs.
2.	OS2– Involuntary resettlement, land acquisition, population displacement and compensation	It relates to Bank-financed projects that cause the involuntary resettlement of people. It seeks to ensure that when people must be displaced they are treated fairly, equitably, and in a socially and culturally sensitive manner; that they receive compensation and resettlement assistance so that their standards of living, income-earning capacity, production levels and overall means of livelihood are improved; and that they share in the benefits of the project that involves their resettlement.	Triggered	The project will not acquire lands since interventions will focus on only existing farmers and value chain actors. However, the project implementation could restrict locals or herders from accessing lands that are used as pasture lands.
3.	OS3- Biodiversity, renewable resources and ecosystem services	This Operational Safeguard (OS) outlines the requirements for borrowers or clients to (i) identify and implement opportunities to conserve and sustainably use biodiversity and natural habitats, and (ii) observe, implement, and respond to requirements for the conservation and sustainable	Triggered	OS3 is triggered since the proposed interventions will involve extraction of natural resources including use of water, soils (e.g., commercial harvesting, agriculture, livestock).

No.	AfDB Operational Safeguard Policy	Summary of core requirements	Potential for Trigger under proposed project	Applicability to proposed project
		management of priority ecosystem services		
4.	OS 4–Pollution prevention and control, hazardous materials and resource efficiency	This OS outlines the main pollution prevention and control requirements for borrowers or clients to achieve high quality environmental performance, and efficient and sustainable use of natural resources, over the life of a project. It draws on and aligns Bank operations with existing international conventions and standards related to pollution, hazardous materials and waste, and related issues	Triggered	OS4 is triggered because potential environment and social impact due to emissions of pollutants and waste is anticipated during the construction phase. Likewise, agriculture development activities will involve the use of improved application of fertilizers and agro-chemicals, as well as result in the production of agriculture wastes. These will be managed as per measures prescribed in the ESMP.
5.	OS5–Labour conditions, health and safety	This OS outlines the main requirements for borrowers or clients to protect the rights of workers and provide for their basic needs. When the borrower or client intends to employ a workforce for a project, it develops and implements a human resources policy and procedures appropriate to the nature and size of the project, with the scale of the workforce in alignment with this OS and with applicable national laws. The OS requires the protection of the workforce through the institution of appropriate health and safety measures taking into account risks inherent in the particular sector and specific classes of hazards in the borrower's work and does not support the use of child labour and forced labour	Triggered	The Contractor shall comply with the Labour laws and Occupational Health and Safety Best Practice.

5.0 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

Baseline conditions give the existing status of the environment in the area before the commencement of the proposed project. The information serves the purpose of a base reference against which the changes due to the implementation of the project are measured. The baseline conditions of the proposed project area are discussed in this chapter.

5.1 Project Location

5.1.1 Direct influence area of the project

Beneficiary villages, which have been designated based on the availability of huge acreage for commercial farming, will constitute the project's immediate geographical area of effect. The environmental and socioeconomic circumstances in these settlements are described in **Table 5-1**. Because the environmental and socioeconomic factors are essentially consistent, information on the Bawku West District, where the project villages are located, is referred to.

Table 5- 1: Environmental and social conditions in Potential Communities

MMDA	POTENTIAL COMMUNITIES	BASELINE ENVIRONMENT
Bawku West	Gbere	**Topography**: The landscape is generally flat. **Drainage**: The area is drained by the Gbere stream which is about 500m from the community. **Biodiversity**: The vegetation cover consists of trees, shrubs and grasses. Some common fauna found in the community include rats, mice, birds and worms. **Socioeconomic activities**: the major economic activities in the community include, farming and trading. Crops cultivated include Cowpea, Millet, Sorghum, Sweet Potato, Bambara beans. **Natural disasters:** Bushfires, floods, and windstorms are all common natural catastrophes in the area.
	Boya Kpalsako	**Topography**: The topography can be described as generally flat. **Drainage:** The Kpalsako stream, around 500 metres from the settlement, drains the area. **Biodiversity**: The vegetation is characterized by a few shea trees, shrubs, and grasses. Rats, mice, birds, and worms are some of the regular fauna found in the community. **Socioeconomic activities** Farming and commerce are two of the community's most important economic activities. Crops cultivated include Cowpea, Millet, Sorghum, Sweet Potato, Bambara beans. **Natural disasters:** Natural disasters that are regular in the community include bushfires, floods and windstorms.
	Sitande	**Topography**: The surface is generally flat. **Drainage**: The source of water is the Sitande stream, which is around 1km from the village. **Biodiversity**: Trees, shrubs, and grasses make up the area's vegetation. Rats, mice, birds, and worms are some of the common fauna.

		Socio-economic activities: Farming, and commerce (shea butter processing, charcoal manufacture, and firewood sale) are the primary economic activities. Crops cultivated include Cowpea, Millet, Sorghum, Sweet Potato, Bambara beans. **Natural disasters**: Natural disasters that usually occur in the community include bushfires, windstorms, and floods.
	Biringu	**Topography**: The landform can be described as flat. **Drainage**: The Biringu stream, about 800m from the settlement, drains the area. **Biodiversity**: The biodiversity of the community is made up of a variety of tree, shrub, and grass species and some common fauna such as birds, mice, rats, and worms. **Socioeconomic activities**: Farming, and trading are the major economic activities the community engages in. Crops cultivated include Cowpea, Millet, Sorghum, Sweet Potato, Bambara beans. **Natural disasters**: Bushfires, flooding and windstorms are the natural disasters that occur frequently in the community.
	Lamboya	**Topography**: The topography can be described as largely flat. **Drainage**: The Lamboya stream drains the community. **Biodiversity**: The vegetation is predominantly shrubs, grasses, and trees. Some common fauna are mice, rats, birds and worms. **Socioeconomic activities**: Trading and farming are the main economic activities. Crops cultivated include Cowpea, Millet, Sorghum, Sweet Potato, Bambara beans. **Natural disasters**: Bushfires, flooding and windstorms are the natural disasters that occur frequently in the community
	Tilli	**Topography:** The landform may be defined as flat in topography. **Drainage:** Drainage is provided by the Tilli, which is located around 1 kilometre from the village. **Biodiversity:** The community's biodiversity includes a wide range of tree, shrub, and grass species, as well as some common fauna such as birds, mice, rats, and worms. **Socioeconomic activities**: Farming and trading are the two most important economic activities in the community. Cowpea, Millet, Sorghum, Sweet Potato, and Bambara beans are among the crops grown. **Natural disasters:** The most common natural disasters in the community are bushfires, flooding, and windstorms.
	Zongoire	**Topography**: The land is generally flat. **Drainage:** The Zongoire stream, which is located about 1.5 kilometres from the village, drains the area. **Biodiversity**: There are trees, shrubs, and grasses as well as some common fauna like birds, mice, rats, and worms. **Socioeconomic activities**: Major economic activities are farming and trade. Among the crops planted are cowpea, millet, sorghum, sweet potato, and bambara beans. **Natural disasters:** Bushfires, floods, and windstorms are the most prevalent natural disasters in the area.
	Farik	**Topography**: The terrain is largely flat. **Drainage**: The Farik stream, about 1km away, is the source of water for the community.

		Biodiversity: The biodiversity of the community is made up of a variety of tree, shrub, and grass species, some common fauna birds, mice, rats and worms. **Socioeconomic activities**: Farming, and trading are the major economic activities that the community engages in. Crops cultivated include Cowpea, Millet, Sorghum, Sweet Potato, Bambara beans. **Natural disasters**: bushfires, flooding and windstorms are the natural disasters that occur frequently in the community.
	Widnaba	**Topography**: The landform can be described as flat. **Drainage**: The Windnaba, about 1.5km from the community, drains the area. **Biodiversity**: The biodiversity of the community is made up of a variety of tree, shrub, and grass species, some common fauna birds, mice, rats and worms. **Socioeconomic activities**: Farming, and trading are the major economic activities that the community engages in. Crops cultivated include Cowpea, Millet, Sorghum, Sweet Potato, Bambara beans. **Natural disasters**: bushfires, flooding and windstorms are the natural disasters that occur frequently in the community.
	Gundago	**Topography**: The surface is generally flat. **Drainage**: The region is drained by the Gundago, which is around 1.5km from the village. **Biodiversity**: The bulk of the vegetative cover is made up of various types of trees, shrubs, and grasses. Rats, mice, birds, and worms are some of the common flora in the neighbourhood. **Socio-Economic Activities**: Farming, and commerce (shea butter processing, charcoal manufacture, and firewood sale) are the primary economic activities. Crops cultivated include; Cowpea, Millet, Sorghum, Sweet Potato, Bambara beans. **Natural disasters**: Natural disasters that usually occur in the community include bushfires, windstorms and floods.
	Yarigu	**Topography**: The topography can be described as generally flat. **Drainage:** The Yarigu, around 2 km from the settlement, drains the region. **Biodiversity**: Various varieties of trees, shrubs, and grasses make up the majority of the vegetative cover. Rats, mice, birds, and worms are some of the regular fauna found in the community. **Socioeconomic activities** Farming and commerce are two of the community's most important economic activities. Crops cultivated include; Cowpea, Millet, Sorghum, Sweet Potato, Bambara beans. **Natural disasters:** Natural disasters that are regular in the community include bushfires, floods and windstorms.
	Tanga Kpantarigu	**Topography**: The landscape of the district is generally flat. **Drainage**: The area is drained by the Kpantarigu which is about 1km from the community. **Biodiversity**: The vegetation cover is predominantly made-up various species of trees, shrubs and grasses. Some common fauna found in the community include rats, mice, birds and worms. **Socioeconomic activities**: the major economic activities in the community include, farming and trading. Crops cultivated include; Cowpea, Millet, Sorghum, Sweet Potato, Bambara beans.

		Natural disasters: Bushfires, floods, and windstorms are all common natural catastrophes in the area.
	Googo	**Topography**: The surface is generally flat. **Drainage**: The area is drained by the White Volta, which is around 1.0km from the village. **Biodiversity**: The bulk of the vegetative cover is made up of various types of trees, shrubs, and grasses. Rats, mice, birds, and worms are some of the common flora in the neighbourhood. **Socio-Economic Activities**: Farming, and commerce (shea butter processing, charcoal manufacture, and firewood sale) are the primary economic activities. Crops cultivated include; Cowpea, Millet, Sorghum, Sweet Potato, Bambara beans. **Natural disasters**: Natural disasters that usually occur in the community include bushfires, windstorms and floods.

5.1.2 Indirect influence area of the project: Bawku West District

The Bawku West District is located in the Upper East Region of Ghana and lies between latitudes 10° 30'N and 11° 10'N, and longitudes 0° 20'E and 0° 35'E. It has a land area of approximately 1,096 sqkm, which constitutes about 11.1% of the total land area of the Upper East Region. It is the third biggest district in the Region in terms of land area next to Garu Timpane. It shares boundaries with the Republic of Burkina Faso to the north, Binduri and Garu-Tempane Districts to the east, Talensi and Nabdam Districts to the west, and East Mamprusi Municipality to the south. **(Figure 5-1)**.

Figure 5- 1: Map of Ghana showing the beneficiary districts including Bawku West

5.2 Physical Environment

5.2.1 Topography and Drainage

The district has a generally gently undulating landform, broken in some places by hills or ranges formed either by outcrops of resistant Birimian rocks or of granite intrusions. About 75% of the district lies between 183m to 244m above sea level. Parts of the northern fringes of the district are between 244m to 305m with few isolated hills exceeding 305m above sea level. The area is drained by the White Volta with its major tributaries including the Red Volta, the Nauho River and other minor tributaries such as Gbere, Kpalsako, Sitande, Biringu, Lamboya, Tilli, Zongoire, Farik, Widnaba, Gundago, Yarigu, Kpantarigu.

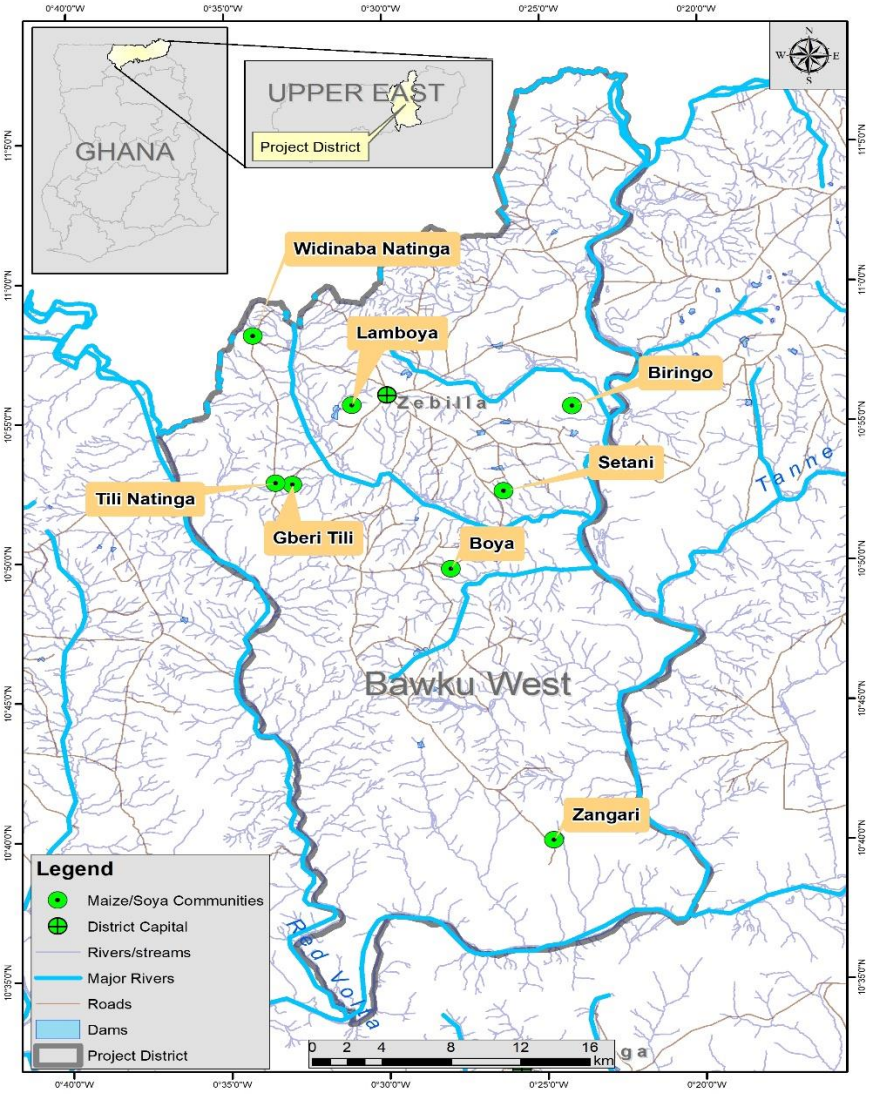


Figure 5- 2: Drainage Map of the Bawku West District

5.2.2 Geology and Soils

The district is underlain by formations of Voltaian sandstones. Although the Voltaian rocks have similar relief characteristics as those over granite and phyllites, they are marked by small escarpments, examples of which can be seen at Zongoyiri. These rise to 100 – 150ft (33m to 50m) above the White Volta. There are other rocks located in the Tilli – Widnaba area and Teshie – Soogo – Sapelliga area to the North. In the Eastern section of the district are found the Boya-Kpalsako hills.

The soil of the district has less accumulation of organic material in the surface horizons. This is associated with the Interior zone of Ghana and this is primarily due to high temperatures and the rapid rate of decomposition. Other human activities such as bush fires, grazing and the slash and burn method of cultivation have also reduced the soil's organic content drastically.

The soils here have been generally developed over the granitic rocks and over basic rocks mostly of the Birimian, Tanchera series, Kolingu series and the Mogo constitution. The Tanchera and Kolingu series cover about two-third of the district and are developed over granite rocks. Soils of this nature have

topsoils of varying texture. However, soils developed over basic rocks and most of the valley bottoms have heavier topsoils and subsoils. The soils of the Tanchera association are loose, porous, coarse texture and easy to cultivate. It has low moisture retention due to the sandy nature. Internal drainage is relatively excessive while external drainage is low.

About 85% of the total landscape of the district is arable and suitable for the growth of varying crops, such as millet, sorghum, maize, groundnuts, bambara beans, cowpeas and tobacco. But the soil needs to be protected against soil erosion by adequate soil conservation practices like crops rotation, contour farming, strip cropping, and provision of enough ground cover/cover cropping. Also, maintaining a high content of soil and organic matter, can improve the moisture holding capacity of the soil. Concerning, the soil fertility of the series, there is the need to apply nitrogen, phosphorous and potassium. Crop yields from the soil series can be increased by the application of farmyard manure, compost manure or additional application of super-phosphate fertilizer.

The sustainability of good crop yields is therefore closely linked with careful management of the soils with the objective of preventing and controlling erosion, increasing their organic matter content (compost, crop residues, farmyard manure, etc.) and replacing and increasing plant nutrients lost through erosion, leaching and crop uptake

The Kolingu soil series also found in the district has low moisture retention. Rainwater filtering is very easy and therefore prone to the effects of drought because the water moves laterally down slopes to valley bottoms. Apart from the aforementioned soil types, there are Nangodi Association developed from Birimian rocks and occupies the Northern – most portion of the District and the Kintampo Association developed over Voltaian rocks occupying the southern – most portion of the district bordering the White Volta.

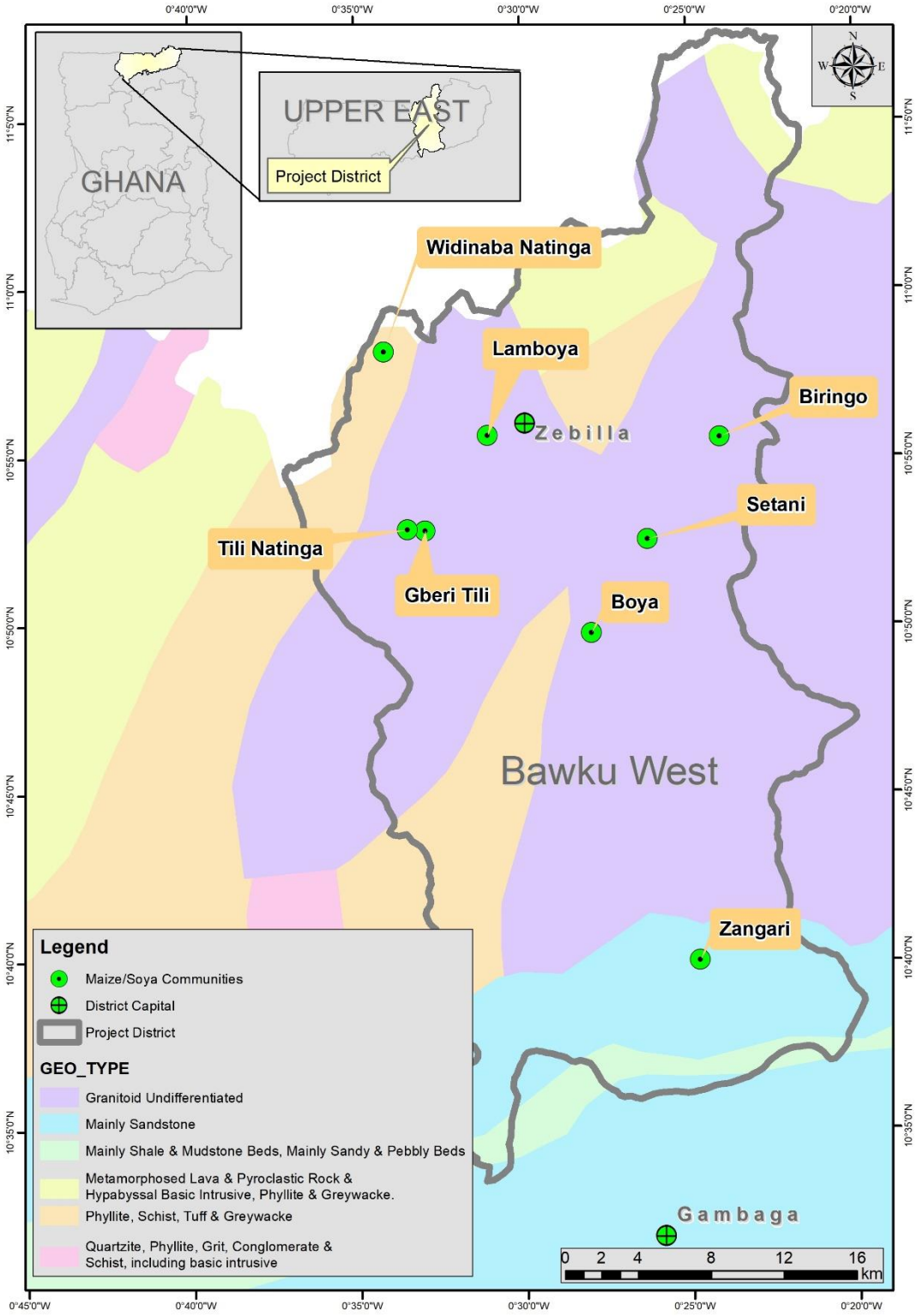


Figure 5- 3: Geology of the Bawku West District

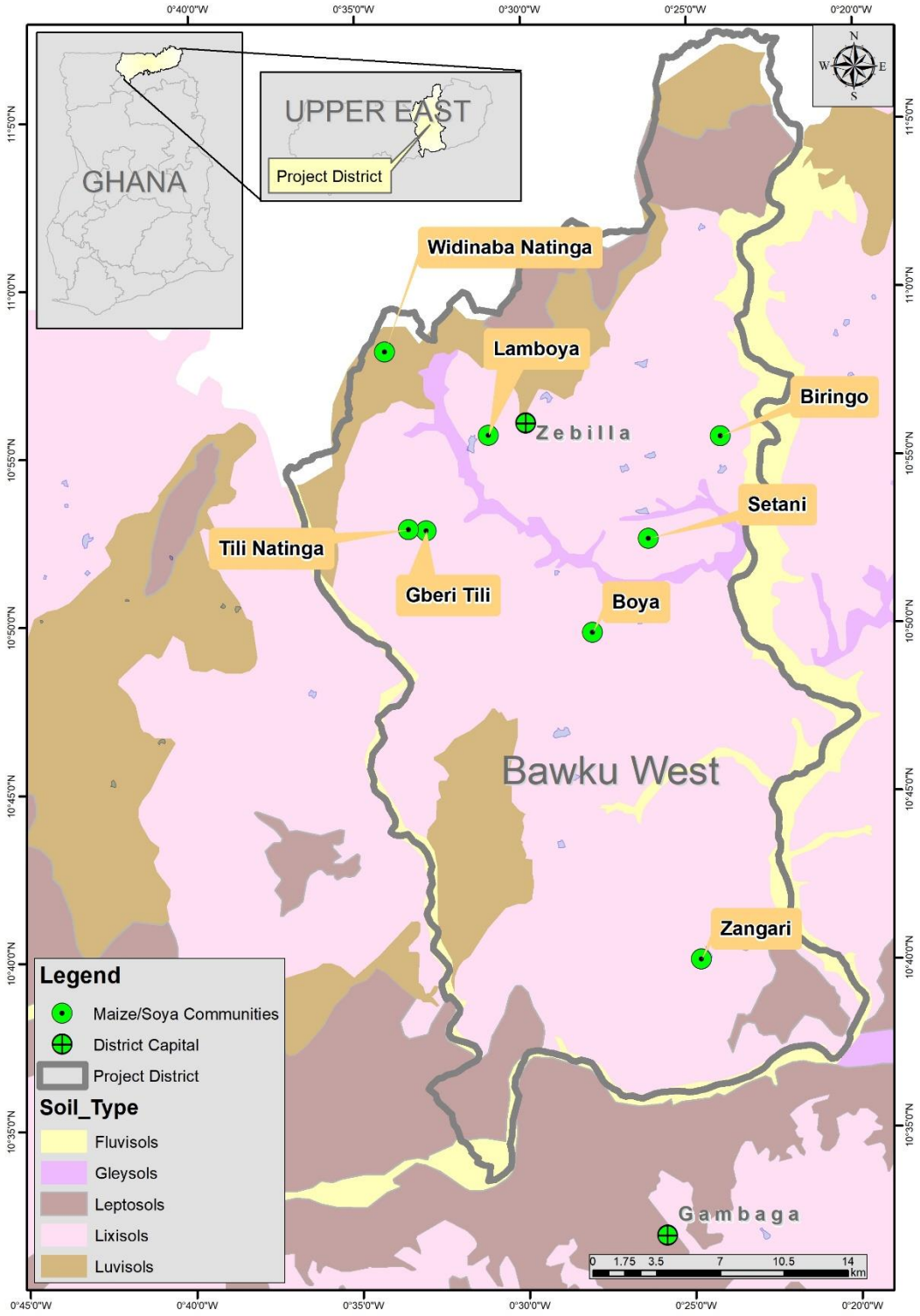


Figure 5- 4: Soil Map of the Bawku West District

5.2.3 Climate

The movement of two oscillating air masses; namely the harmattan and the monsoon, influences the climate of the area. The harmattan air mass, which blows from a north-easterly direction across its area, originates from the Sahara, reaching its maximum southward extend into January. This period is characterized by dry and dusty conditions. The Monsoon air mass, which blows from South to North, passes over the area reaching its maximum northward extend into August and September and is characterized by warm, humid and wet conditions.

The district experiences a unimodal rainfall regime lasting 4 to 6 months and a long dry period of 6 to 8 months in a year. The average annual rainfall, temperature and relative humidity are 956mm, 34^{o}C and 56% respectively, with potential evapotranspiration of more than 2882mm. There is therefore excessive evapotranspiration over rainfall.

5.2.4 Environmental Quality

The Googo community was chosen for environmental quality assessment out of the thirteen (13) potential communities because it has the largest land area suitable for cultivation of maize and soybeans.

Air Quality

The sampling and analysis of ambient particulate matter concentrations was done according to the ASTM Test Method D4096-17. Particulate matter was sampled for 24 hours using ARA N-FRM Air Sampler set to a flow rate of 16.7 L/min drawing air through the inlet onto a 47mm quartz filter for analysis. The quartz filter paper was stabilized for a minimum of 24 hours before and after sampling in a desiccator.

The ARA N-FRM air sampler is equipped with a RTP profiler, which uses a Plantower light-scattering sensor to provide real-time data for two size ranges approximating PM10 and PM2.5. It shows trends during the sample run, supplementing the filter data. The fresh quartz filter paper was weighed before and after the 24-hour sampling period, and the difference in weight (W2-W1) used to calculate the concentration of the particulate matter in µg/m^3.

The Particulate Matter ($PM_{2.5}$ and PM_{10}) concentrations monitored at Googo Community were 13 µg/m3 and 34 µg/m3 which are within the Ghana Standard (GS 1239:2019) permissible values of 35 and 70 (µg/m3). The monitoring team did not observe enough activities in the communities that could significantly influence the air quality at the time of the assessment.

Ambient Noise

Noise measurements/recordings were taken with a High Precision TSI Quest Sound Level Meter, Model Type 1. The sound level meter has an in-built calibrator and was calibrated before each measurement/recordings were taken. The noise meter was calibrated at 114 dB (A) prior to the measurement. The following statistical indices was computed Lmax, Lmin, LAeq, L10, L50, L90

The ambient noise levels (L_{EQ} values) recorded were compared to their respective Ghana Standard (GS 1222:2018) and IFC guideline values. The daytime ambient noise levels (dBA) for the project site (58.7dBA)

was below the GSA and of 60 but slightly above the IFC L_{EQ} guideline values 55. The night-time ambient noise level (dBA) for the project site (51.3dBA) was also below the GSA and IFC L_{EQ} guideline values of 55dBA and 70dba. **(Annex 6)**.

Surface water quality

Water testing was done at the nearest water source, the White Volta, which the community relies on for drinking, washing, and farming. This water source which could potentially be a recipient of any pollution impact from the project was tested on the, 26th January 2022 at 10:12am. Parameters including Temperature, pH, TDS, and conductivity were measured in-situ using a field kit, Thermo Scientific EUTECH Handheld Meter Kit.

Water quality parameters measured were found to be below the WHO drinking water guidelines, showing that the quality of the White Volta is generally good with pH of 8.01, conductivity, 103.6 µS/cm, and TDS of 55.56 **(Annex 6)**.

5.3 Biological Environment

5.3.1 Vegetation

The district's vegetation is Sudan Savanna consisting of short drought and fire-resistant deciduous trees interspersed with open savanna grassland. Grass is very sparse and in most areas the land is bare and severely eroded. Common grasses include *Andropogan gayanus* (Northern Gamber Grass) in the less eroded areas and *Hyparhenia spp, Aristida spp, and Heteropogon spp.* (Spear grass) in the severely eroded areas. Common trees include *Anogeissus spp, Acacia spp* (Thorn tree) and *Triplochiton spp.* Economic trees include *Parkia filicoidea* (Dawadawa), *Butyrospermum parkii* (Sheanut), *Andansonia digitata* (Baobab) and *Ceiba pentandra* (Kapok).

In most cases the vegetation is highly degraded by land clearing for farming, fuel wood harvesting, overgrazing, annual bushfires and harvesting of poles for construction. The activities of illegal miners are also contributing to the degradation of the vegetation in some parts of the district (Teshie, Widnaba, Zongire, Zebilla, etc.) as most of these illegal activities take place on agricultural lands, and this therefore has serious implications on soil fertility for sustainable crop production.

Another phenomenon that has recently started occurring is the felling of Dalbergia nigra commomly known as rosewood. This phenomenon occurs in areas like Zongoiri, Binaba, Kusanaba and Tilli where the trees are cut and carted out of the district for export.

The sparsely inhabited Oncho-freed woodland and forest belt and the uninhabited forest reserve along the eastern and southern portions of the Red and White Volta, stretching from Widnaba-Tilli area in the District through Binaba-Kusanaba and Zongoiri to East Mamprusi, is a favourable abode of a variety of animals including elephants. This forest belt (Eastern Wildlife Corridor) is the natural route for elephants moving to and from Burkina Faso. The forest belt with its rich flora and fauna presents an ecotourism potential in the district. However, the wild animal resources are severely depleted, and their habitats

continue to be under siege from various economic activities including land clearing for agriculture, indiscriminate bush burning, hunting for bush meat, logging and mining.

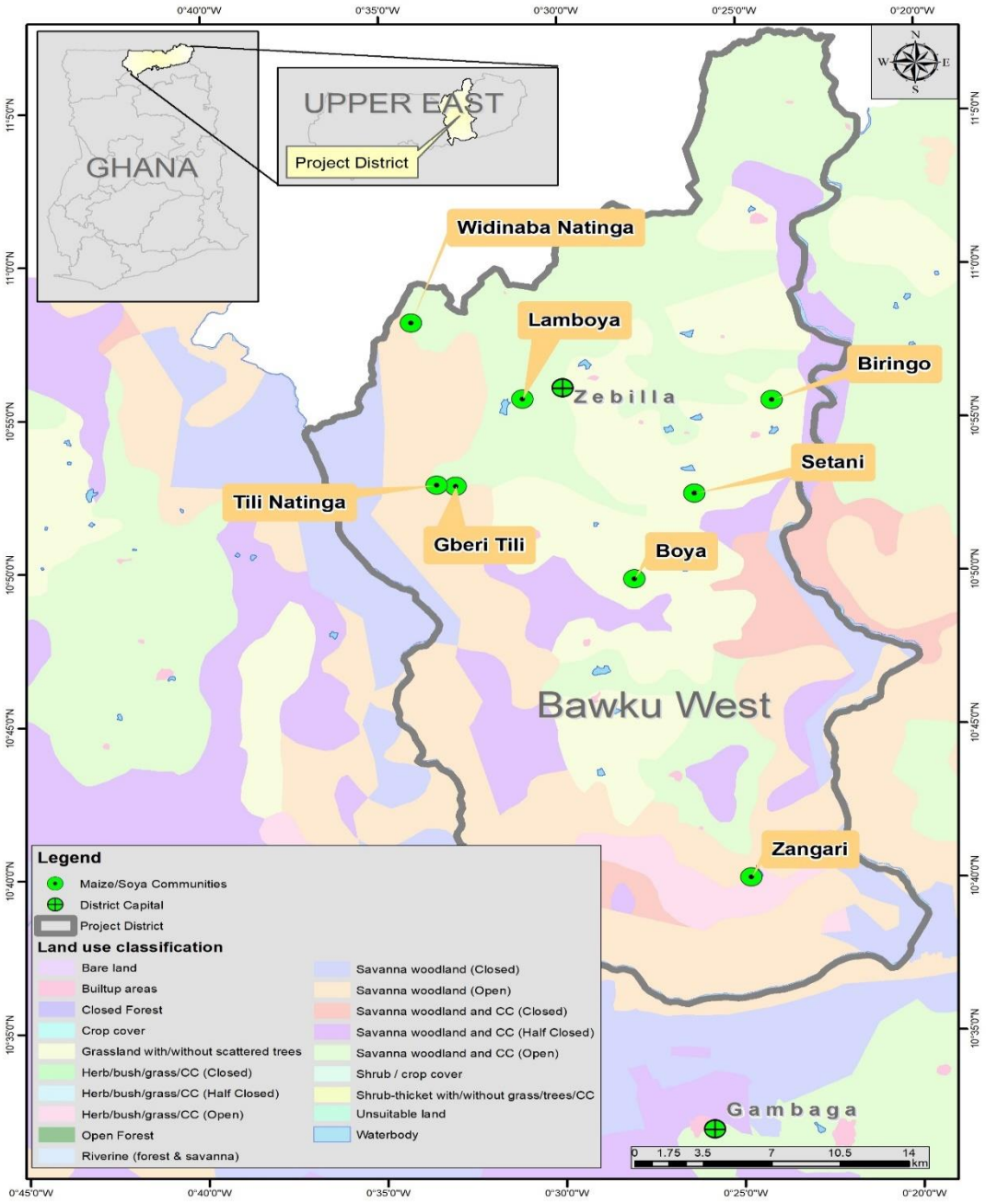


Figure 5- 5: Land cover map of the Bawku West District

5.4 Socio-Economic Environment

5.4.1 Governance Structure

The Bawku West District Assembly is the highest administrative, political and planning authority in the district, which is charged with the responsibility of formulating and implementing development plans, programmes and projects. The District Assembly has a policy making body, the General Assembly made up of 49 Assembly members of which 34 are elected and 15 are appointed by the President of the Republic of Ghana.

The political and executive head of the District Assembly is the District Chief Executive (DCE). The DCE chairs the Executive Committee, which performs the administrative and executive functions of the Assembly. The Assembly is presided over by a Presiding Member who is elected from the Assembly by a two-thirds majority of the Assembly Members. The Assembly has sub-committees through which the Executive Committee operates.

In the traditional set up the Bawku West District is under the Bawku paramountcy of the Bawku Traditional Area. There are ten (10) divisional chiefs in the district and these include the Zebilla Naaba, Teshie Naaba, Binaba Naaba, Zongoire Naaba, Kusanaba Naaba, Tilli Naaba, Widnaba Naaba, Sapelliga Naaba, Tanga Naaba and Timonde Naaba.

5.4.2 Demography

The district population is 144,189 made up of 70,781 (49.1%) males and 73,408 (50.9%) females. This is about 11.1% and 0.47% of the regional and national population respectively. The district has 21,731(15.1%) of its population located in urban areas with 122,458 (84.9%) of the population located in rural settlements. The population density is 131.5 persons per sqkm with a total of 26,877 households and an average household size of 5.3 persons per household which is higher than the regional average of 4.8.

The dominant types of housing within the district are mud structures roofed with thatch with the thatch giving way to zinc roofing sheets. The average occupancy ratio is between 5 to 9 persons and sanitary conditions are generally poor. However, modern buildings are springing up in Zebilla, Binaba, Kusanaba, Sapeliga and other settlements. While some are offices and residential accommodation for public servants, others are for individual residents.

The most predominant ethnic group in the district is the Kusasi. They co-exist peacefully with other tribes who are mainly settlers who have lived in the district for a long time. Some of these tribes include Frafras, Kasenas, Mamprusis, Moshies, Busangas, Akans and Fulanis. There are also Ewes who are settler fishermen along the White Volta at Zongoiri.

The African Traditional Religion is the predominant religion with 44.0% of the population, followed by Christianity (35.0%) and then Islam (18.0%). Only a small proportion of the population either adhere to other religions (1.0%) or are not affiliated to any religion (2.0%).

5.4.3 Education and Literacy

Majority (64%) of the population 11 years and older is literate. A large proportion (97.7%) of the population can read and write in English. In terms of the ability to read and write in the English language only 80.5% of the population reported they can, whereas 0.1% of the population can read and write in at least one Ghanaian language. The proportion of the population who are literate in English only is higher among the younger ages (11-24 years) compared to the older cohorts. This pattern may reflect the impact of the policy increasing access to education at all levels. On the other hand, literacy in Ghanaian language only is more common among both male and female older cohorts of the population than the younger cohorts.

5.4.4 Economic Activities

Agriculture is the dominant occupation in the district. The majority (86.5%) of males find themselves in agriculture compared to 76.4% of females in the same sector. Other livelihood activities include charcoal burning, harvesting and sale of fuel wood, grass cutting, hunting, trading, pottery, weaving, carpentry and joinery, fitting, blacksmithing, hairdressing, dressmaking, drinking, and chop bar keeping, distribution of petroleum products, sale of building materials and telecommunication services.

The available industries include groundnut oil processing, shea butter extraction, dawadawa and malt processing, rice parboiling and milling and weaving of smock materials which are done using simple local technology. The major marketing centres in the district include Zebilla, Binaba, Sapelliga, Gbantongo (Kukore) and Agatusi. Others include Tanga, Timonde and Widnaba markets. The main items traded in these markets are maize, rice, millet, beans, sorghum, and groundnuts. Other items are malt, dawadawa, onions and livestock.

These businesses are carried out on a very small (micro) scale due to very limited investment in the private sector. This basically has to do with the undeveloped nature of the private sector in the district. It is estimated that females dominate this informal economy averaging more than 80%. The implication is that there is high level of poverty in this sector with majority of them being females. There is therefore the need to promote and sustain the activities of this informal sector which has a lot of potentials to promote local economic development in the district.

5.4.5 Utilities and Services

<u>Energy</u>

The main source of lighting of dwelling units in the district is flashlight/torch (43.1%), followed by kerosene lamp (39.8 %), electricity (14.3%) and other sources such as solar, gas lamp, and firewood. Also, wood (80.2%) is the main source of cooking fuel for households. This is followed by crop residue (9.7%), charcoal (6.6%) etc.

<u>Water</u>

The water supply condition in the district is directly related to the underlying rocks. Areas occupied by Birimian rocks have a high surface runoff so that surface flow of streams generally persist throughout the dry season as observed at some places such as Komaka, Kasongo and Kubongo. The rocks weather into clay and this combines with the relatively impermeable bedrock to give conditions favourable for surface water storage. The district water supply sources are mainly made up of boreholes (487), hand dug wells fitted with pumps (147), small town water systems (3), ponds, streams, and dugouts. At Komaka, farmers reported year-round flow of water from springs at the foot slopes of the greenstone hills separating Ghana from Burkina Faso.

At present the main sources of domestic water supply in the district are from rivers, springs, wells, boreholes, ponds and dugouts. Most rivers and springs dry up towards the end of the dry season making water a scarce commodity. At such periods water may be obtained from shallow wells.

Sanitation and Waste Management

These are family latrines and 54.5% of them are traditional, 32% are KVIP and 14% belong to other types. 84% of the households interviewed do not have latrines. This is due to the low latrine coverage rate (1%) which varies depending on Areas Councils: Tilli/Widnaba and Tanga/Timonde have rates beyond 1% (respectively 3 and 2%). The low rate is due to the limited number of latrines but also is a result of the prevalence of traditional facilities which actually do not meet the sanitation standards. Thus, community members use the bush, which poses serious hygiene issues.

They are latrines built in schools and markets. These facilities remain insufficient especially in a district where people have open air defecation practices. But a total of 24 public toilets were listed and 67 institutional latrines (WC) with a functionality rate of 65 and 81% respectively. These latrines are frequently used as they are limited in number and some of them are out of order and failing to have them clean can cause many infections.

Communication

Out of the population 12 years and older, 48.0% (27.5% males and 20.5% females) own mobile phones. Also, 13.4% of the population has access to the internet and the proportion of males (9.1%) among users of the internet facility is more than females (4.3%).

5.4.6 Health

There are 159 settlements in the district are served by 41 health facilities including 1 Hospital, 4 Health Centers, 10 Clinics (7 Public and 3 Private), 23 CHPS Compounds, 2 Supplementary Feeding Centers, and 1 Nutrition Rehabilitation Center.

The District Health Directorate as part of its efforts to increase access to health care has demarcated the district into 18 zones, which are in the six sub-districts. Currently, 13 of the zones are functioning and catering for the 144,189 people. Below are the various types of health facilities in the district between 2014 and 2017.

FACILITY	2014			2015			2016		
	Public	Private	Total	Public	Private	Total	Public	Private	Total
Hospitals	1	0	1	1	0	1	1	0	1
Health Centres	4	0	4	4	0	4	4	0	4
Clinics	7	3	10	7	3	10	7	3	10
CHPS	16	0	16	18	0	18	18	0	18
Total	28	3	31	30	3	33	30	3	33

Source: DHMT, 2017

5.4.7 Transportation

The main road transport service provider in the district is the Ghana Private Road Transport Union (GPRTU) of the Trades Union Congress (TUC), which provides bus services to mainly Kumasi, and to a few villages especially during market days. Majority of locals depend on bicycles, motorcycles, and donkey carts (used for carting goods) owned by individuals while others commute on foot from one place to another. Another new means of transport that recently sprung up is the motor tricycle popularly known as “Motor King” and “Mahama Can Do”

Analysis of the district road network reveals that apart from the main Bolgatanga-Bawku Road (incidentally the only trunk road in the district), which passes through Tilli, Zebilla and Kubore (31 km) and a section of the Tilli- Binaba feeder road (10.00 km) and a section of Zebilla – Zabre road (4.00 km), all the other roads in the district are untarred. The tarred trunk and feeder roads cover a distance of 45 kilometers. The rest of the roads, which cover an estimated distance of 290.4 kilometers, are classified as feeder roads. These roads are of various degrees of motorability which are further classified as engineered, unengineered and partially engineered.

Since 2010 the length of feeder roads in the district has remained the same. The engineered roads cover an estimated distance of 235.4 kilometers, the unengineered roads 29.8 kilometers and the partially engineered roads covering an estimated distance of 25.2 kilometers. However, it is important to note that there are a lot of communities in the district which are inaccessible, and this greatly affects socio-economic activities, particularly agriculture activities in the district. There has also been some amount of opening of new feeder roads in some sections of the district.

5.4.8 Land Ownership/Tenure

There are two common types of land ownership, and these are family ownership and clan ownership. No individual per se has complete right of title to land. On the other hand, individuals can claim ownership of a land as they have right to the temporal usage.

There are chiefs and ‘tindaanas (tindaanama)’, the heads of clans or lineages of aboriginal descent, in every community. People with these two titles in the communities wield considerable power and authority over their people. While the chiefs are the traditional political heads in the communities, the

tindaanas are the main custodians of the land from ancestral traditions (ritual ownership) and hold in trust for the people.

The tindaana allocates use of unclaimed land within his area of jurisdiction and is entitled to ritual, not economic gifts of first fruits. He claims the right of reversion and totally abandoned land reverts to him for reallocation. Farmland, especially for the compound farm, is vested in the head of the compound by right of seniority. However, land acquired by a man's own efforts in clearing and cultivating bush land remains his individual property while he lives and is inherited by his sons.

In keeping with the strong patrilineal nature of the kingship system, land is allocated only to men as females have no right to usufruct. However, women can obtain access to land for farming mainly through their social relations with male members of the community.

6.0 POTENTIAL ENVIRONMENTAL AND SOCIAL ISSUES AND IMPACTS

6.1 Project Area of Influence

The ESIA gives an identification, qualitative assessment and classification of potential environmental and social impacts and their respective management options based on the general project design concepts. The SADP will have both positive and negative social, economic, and environmental impacts at different levels.

6.2 Geographical area of influence

The immediate geographical area of influence will be the 12 beneficiary communities which were selected based on their proximity to vast agricultural land and existing commercial farms or agricultural establishments such as poultry, warehousing facilities, and processing plants

6.3 Environmentally sensitive areas to be influenced

The project area is considered an environmentally sensitive area according to the list of Environmentally Sensitive Areas of the Environmental Assessment Regulations 1999 (LI 1652), Schedule 5 (Regulation 30 (2)) – No. 7. The dry climatic conditions make the area fire prone (**see Annex 2**).

6.4 Community influence and vulnerable groups

Communities in proximity to commercial farms or agricultural establishments may be affected by construction activities especially construction or expansion of infrastructure such as warehouses, hatcheries, etc.

Vulnerable groups are those at risk of becoming more vulnerable due to impacts from project implementation. These vulnerable people include, but not limited to:

- disabled persons, whether mentally or physically challenged;
- the elderly, usually from 70 years and above;
- very sick and or physically weak individuals;
- people without formal land rights;
- migrants/settlers;
- women; and
- children.

6.5 Institutional Influence

The major institutions to be influenced or involved in the proposed project include:

- Ministry of Food and Agriculture;

- Project Coordinating Unit;
- Water Resources Commission;
- Lands Commission;
- Forestry Commission;
- Environmental Protection Agency;
- Regional Coordinating Council;
- District Assembly;
- Fire Service; and
- NADMO.

6.6 Criteria of Impact Evaluation

6.6.1 Duration of the Impact

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

6.6.2 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.

6.6.3 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 some its utilization or its characteristics.

6.6.4 Impact severity

- A ‘negligible or nil impact’ or an impact of negligible significance is where a resource or receptor will not be affected in any way by a particular activity, or the predicted effect is deemed to be imperceptible or is indistinguishable from natural background levels.
- A ‘minor impact’ or an impact of minor significance is one where an effect will be experienced, but the impact magnitude is sufficiently small and well within accepted standards, and/or the receptor is

of low sensitivity/value. In such instances, standard construction/ operational practices can address such impacts.

- A 'moderate impact' or an impact of moderate significance is where an effect will be within accepted limits and standards. Moderate impacts may cover a broad range, from a threshold below which the impact is minor, up to a level that might be just short of breaching an established (legal) limit. In such cases, standard construction practices can take care of these impacts, but mitigation measures may also be required.
- A 'major impact' or an impact of major significance is one where an accepted limit or standard may be exceeded, or large magnitude impacts occur to highly valued/sensitive resource/receptors. In such cases, alternatives are required to address such impacts otherwise mitigation measures should be adopted with strict monitoring protocols.

The above classification is largely subjective and may be overruled by new site-specific issues or information and detailed project activities not captured in this report.

6.7 Potential Positive Impacts

The significant positive impacts of the proposed project are outlined as follows:

- Creation of job opportunities;
- Increased commerce and boost to local economy;
- Food security and risk reduction;
- Adoption of good agricultural practices;
- Technology transfer
- Availability of poultry waste as organic manure on farms.

6.7.1 Creation of job opportunities

Locals, including women, will be recruited for short-term and long-term occupations during the building and operating stages, creating work possibilities for skilled, semi-skilled, and unskilled labour.

Laborers and piece workers will be employed during the building of different agricultural value chain support infrastructure (assembly/construction of semi-industrial units, construction of warehouses, hatcheries, and so on). The presence of employees will provide opportunities for food sellers, store owners, and other community business owners to earn money. During the operating phase, the number of agricultural jobs will expand, resulting in increased income and poverty reduction.

6.7.2 Increased commerce and boost to local economy

Agricultural productivity will rise quantitatively as crop and poultry producers get access to more automation services. Farmers, input suppliers, transport operators, feed millers, and other actors in the value chain will benefit from increased income. In addition, the project will enhance and enable the formation of local marketing, processing, and quality control services, as well as the development of new investment prospects.

6.7.3 Food security and risk reduction

Food security is a complex issue that is influenced by factors such as food supply, accessibility, use, and stability. Food insecurity affects about 5% of Ghana's population, with another 2 million people on the verge of becoming so. Agricultural growth has outpaced non-agricultural growth in recent years, with an average annual rate of 5.5 percent compared to 5.2 percent for the whole economy.
Increased production capacity, along with the availability of storage facilities, will allow produce to be available throughout the year, reducing reliance on locally produced agricultural items. This will reduce agricultural imports from across the border while simultaneously enhancing food security.

6.7.4 Adoption of good agricultural practices

Throughout the project cycle, the proposed project would include the community and local stakeholders, providing them with information and skills in agricultural methods. The project will provide local stakeholders with a chance to learn about excellent practises such as climate wise agriculture, effective water management, and fertiliser application, among others, which will result in reduced losses and improved pest and disease control.

6.7.5 Technology transfer

Farmers will be exposed to new geomapping, crop and poultry management, pest and disease management, processing, and other technologies that they were previously unaware of. Rice Advice decision assistance, for example, will supply farmers with guidance for specific field circumstances via smart phones. Farmers will get access to pest and disease control technologies that combat parasitic striga, health-threatening aflatoxins, and the Fall Army Worm invasion. Farmers' production and savings will grow when access to mechanical and motorised shellers, threshers, increased seed variety and breeds, contemporary incubation and hatcheries, automated plucking, and veterinary care is improved.

6.7.6 Availability of poultry waste as organic manure on farms

Increased chicken production may be able to alleviate the problem of inorganic fertiliser scarcity. Farmers may utilise their chicken waste to make organic manure, which is ecologically acceptable, and distribute it to other farmers in the district to supplement the distribution of inorganic fertilisers in the savannah regions.

6.8 Major and Moderate Negative Impacts

The environmental impacts of the project have been grouped as major and moderate impacts based on their significance. Also, impacts have been considered at the various phases of the project i.e., preparatory, construction and operation. The major and moderate adverse impacts are described below and in **Table 6-1**:

Preparatory phase

- **Land related disputes -** Acquisition of lands without following due process could result in land-related disputes
- **Restricted access to pastures -** The project activities could restrict locals access to lands and other resources that were otherwise used as pasture areas.
- **Destruction of vegetation -** Site clearing will lead to the destruction of some common vegetation and a few trees.

Construction phase

- **Soil degradation –** Levelling, as part of land preparation, and excavation for foundation of structures such as sheds and warehouses could lead to soil erosion and creation of gullies through runoff especially in the rainy season. Also, oil spillages from the maintenance of construction equipment and vehicles could contaminate soils, waterbodies and affect flora and soil fauna
- **Air pollution –** Land preparation and transport of materials on untarred roads will generate dust. Also, vehicular exhaust fumes will be emitted by trucks and construction equipment. The dust and fumes could adversely affect air quality, especially in the dry season.
- **Water pollution –** Disposal of domestic waste from construction workers and food vendors and deposition of sediment, waste oil, fertilizer, and pesticides via runoff into nearby water bodies will reduce the quality of water and could also smother some fishes and other vertebrate and invertebrate organisms, including benthic ore.
- **Noise and vibration –** Generation of noise and vibration beyond acceptable limits from operation of construction equipment, movement of haulage vehicles and tooting of horns could be a nuisance to residents of nearby communities and other sensitize organisms.
- **Waste generation and disposal -** Clearance of vegetation and levelling of land at project site will generate vegetative waste and excavated spoil. Other wastes such as construction debris, pieces of steel/metal, packaging materials, plastic pieces, human waste etc. if not disposed properly could clog drains, produce foul smell, and facilitate the outbreak of sanitary related diseases such as cholera
- **Inefficient waste management -** Inefficient waste management during construction, operation and maintenance leading to excess consumption of materials, generation of wastes/emissions, pollution of soils and water.
- **Workplace accidents/incidents –** Construction workers could be exposed to workplace and traffic-related accidents/incidents as well as animal/insect threat/bites during land preparation, civil works and transportation of materials or persons.
- **Poor labour working conditions -** Lack of employment contracts could lead to workers being paid rates below the stipulated national minimum wage or work under poor conditions. Also, the absence of welfare facilities like toilets, sheds for dinning, resting, sick bays, etc. could affect their health or lead to indiscriminate defecation.
- **Traffic accident risks -** Transport of materials and equipment to and from the project site through communities and towns raises traffic/public safety concerns. Broken-down, inappropriately parked or slow-moving haulage/construction trucks could lead to road accidents and traffic congestion especially on busy roads.

- **Fire outbreak -** Fire outbreaks from negligence of workers or the public burning refuse, game hunting and workers not properly extinguishing stubs of cigarette. These fires could spread causing injuries to persons and destruction of property.
- **Gender based violence -** Presence of workers and increase in incidents of rape, defilement and GBV
- **Public health issues -** Pollution of local water bodies and ambient air will adversely affect the health of users**.** Sexual relations between workers and locals may bring about increase in sexually transmitted diseases including HIV/AIDs. Interactions between workers and locals could also lead to the spread of COVID-19.
- **Security concerns -** Violent behaviour and confrontations between workers and locals. Workers who are deemed to be financially sound could be victims of theft and burglary**.** Potential conflict over sexual affairs, child labour, drunk driving, accidents, and destruction of property.

Operation phase

- **Soil erosion -** Leaving farmlands bare especially after harvesting could expose the soil to wind erosion from the strong winds in the dry season
- **Air Pollution –** Operation of equipment and vehicles, especially poorly maintained ones, will generate fumes that adversely affect the air quality. Also, haulage of products and inputs such as fertilizers, pesticides, seeds especially on untarred routes to and from farms or agricultural establishments will generate dust.
- **Pollution of Soils and Water –** Wastes, workforce sewage effluent, as well as runoff from cultivated land (containing fertilizers, pesticides fungicides and herbicides, inoculants, etc.) could pollute surface water, reduce its quality, and make it unsuitable for use. prepare an Integrated Pest/Vector Management Framework/Plan to address the impacts on receptors such as waterbodies, beneficiary organisms, humans and animals, insects, fishes, etc. from the expanded use of agrochemicals, including inorganic fertilizers for growth improvement and pesticides against the spread of pests and diseases.
- **Odours -** Odours associated with poultry and waste may have nuisance value for nearby receptors i.e. humans.
- **Noise and Vibration -** Noise and vibration from operation of processing equipment, equipment maintenance, movement of haulage vehicles, tooting of horns and noise from the poultry birds could be a nuisance to persons within the project community or nearby communities. Also, continual high background noise has a detrimental effect on poultry especially in egg production.
- **Waste generation and disposal -** Improper disposal of vegetative waste from weeding, harvests, and domestic waste from workers and effluent from installations could create unsightly scenes and aid in the production of vermin. Also, it could serve as breeding grounds for disease causing vectors like mosquitoes, houseflies, etc.
- **Inefficient waste management -** Inefficient waste management during operation and maintenance leading to excess consumption of materials, generation of wastes/emissions, pollution of soils and water.
- **Workplace accidents/incidents -** Workplace and traffic accidents/incidents and animal/insect threat/bites. Incidence of transmission of H1NI virus from poultry to the workforce

- **Poor labour working conditions -** Lack of employment contracts could lead to workers being paid rates below the stipulated national minimum wage or work under poor conditions. There could be issues of discrimination, forced labour, child labour, restriction of freedom of association and collective bargaining and lack of worker grievance redress mechanism.
- **Traffic accident risks -** Haulage of produce, inputs, and equipment to and from farms through communities raises traffic/public safety concerns. Broken-down, inappropriately parked, or slow-moving haulage trucks could lead to road accidents and traffic congestion especially on busy roads.
- **Fire outbreak -** Fire outbreaks from negligence of workers or the public burning refuse, game hunting and not properly extinguishing stubs of cigarette. These fires could spread causing injuries to persons and destruction of property.
- **Gender based violence -** Presence of workers and increase in incidents of rape, defilement and GBV
- **Public health issues -** Pollution of local water bodies will adversely affect the health of users**.** Sexual relations between workers and locals may bring about increase in sexually transmitted diseases including HIV/AIDs. Interactions between workers and locals could also lead to the spread of COVID-19. There is the potential for the transmission of H1N1 virus from poultry to humans especially workers handling birds
- **Security concerns -** Violent behaviour and confrontations between workers and locals as a result of sexual affairs, child labour, drunk driving, accidents and destruction of property. Workers who are deemed to be financially sound could be victims of theft and burglary.

Table 6- 1: Major and moderate Adverse Impacts of the Subproject in the Bawku West District

No.	Project Component	Description	Possible project area/ activity with potential E&S risks	Relevant OS	Anticipated issues/ risks
1	C1-1	Commercial Production of Maize and Soybean under Conservation Agriculture	• Clearing of vegetation as part of land preparation • Civil works during development of water management systems e.g. dams, dugouts • Civil works, e.g. rehabilitation/expansion of sheds, storage etc. • Equipment purchases and usage e.g. harvesters etc. • Haulage of inputs and produce • Handling and storage of produce • Hiring and management of workers	• 1, 2, 3, 4, 5	• Loss of vegetation and impact on natural habitats • Occupational Health and Safety issues (including COVID-19 infections) • Waste generation (including solid, liquid and hazardous waste) • Noise pollution • Air pollution (including dust, fumes etc.) • Bushfires • Traffic management issues along haulage routes • Potential surface water contamination • Potential produce contamination • Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) • Women and vulnerable individuals or groups • Grievance from workers with respect to labour and working conditions • Potential conflicts between farmers and herdsmen over animal grazing fields

No.	Project Component	Description	Possible project area/ activity with potential E&S risks	Relevant OS	Anticipated issues/ risks
2	C1-2	Promotion of Small and Medium Scale Commercial Poultry Production	• Clearing of vegetation as part of land preparation • Minimum civil works e.g. rehabilitation/expansion of hatchery, storage etc. • Small equipment purchases and usage e.g. hatchers, incubators, brooders/heaters, egg transfer units, rack washers, dressing machine etc. • Hiring and management of workers • Operations of SMEs	• 1, 2, 3, 4, 5	• Loss of vegetation and impact on natural habitats • Occupational Health and Safety issues (including COVID-19 infections) • Waste generation (including solid, liquid and hazardous waste) • Noise pollution • Air pollution (including dust, fumes etc.) • Potential water contamination • Workers' grievances • Sexual Exploitation and Abuse and Sexual Harassment (SEA/SH) • Women and vulnerable individuals or groups excluded from project benefits • Potential elite capture • Grievance from workers with respect to labour and working conditions • Odour from the poultry operations
3	C2-1	Value Addition and SME Development	• Civil works e.g. rehabilitation/expansion of sheds, storage, cold stores etc. • Promotion of packaging, new distribution networks for poultry	• 1, 3, 4, 5	• Occupational Health and Safety issues (including COVID-19 infections) • Waste generation (including solid, liquid and hazardous waste) • Noise pollution • Air pollution (including dust, fumes etc.)

No.	Project Component	Description	Possible project area/ activity with potential E&S risks	Relevant OS	Anticipated issues/ risks
			products, transport services, new agro-input delivery systems • Increased feed processing at feed mills • Hiring and management of workers • Operations of SMEs		• Traffic management along distribution corridors • Potential water contamination • Workers' grievances • Elite capture
4	C2-2	Youth/Women Empowerment and Nutrition	• Production and processing of shea, dawadawa, mango and cashew • Small equipment purchases	• 1, 3, 4, 5	• Occupational Health and Safety issues (including COVID-19 infections) • Waste generation (including solid, liquid and hazardous waste) • Elite capture • Land acquisition and ownership
5	C3-1	Knowledge Management, Monitoring and Evaluation	• Conduct Beneficiary Impact Assessment. • Development and Implementation of Environmental and Social Management Plan (ESMP) • Hiring and management of workers	• 1, 5	• PCU capacity to monitor implementation of ESMP and assess beneficiary impacts • Workers' grievances
6	C3-2	Project Coordination	• Screening of SMEs for their capacity to carry out E&S actions • Procurement of vehicles for PCU, office equipment and furniture as may be required.	• 1, 4, 5	• PCU competence to undertake E&S screening of grant beneficiaries

6.8.1 Preparatory Phase: Major and moderate adverse impacts and specific measures

The preparatory phase major and moderate adverse impacts are provided in **Table 6-2.**

Table 6- 2: Preparatory Phase Potential Adverse Impacts

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
Involuntary resettlement, land acquisition, population displacement and compensation	Land related disputes	Acquisition of lands without following due process could result in land-related disputes	Local	Temporary	Average	Moderate	• Ownership of land should be made a requirement for qualification as a project beneficiary. Evidence of ownership should be produced and documented • For lands without deeds, community consent should be obtained and confirmed
	Restricted access to pasture	The project activities could restrict locals including migrants/settlers access to lands that were otherwise used as pasture areas.	Local	Permanent	Weak	Moderate	• Identify and propose alternative pasture areas to locals who otherwise used the project site as pasture area. • Provide locals with some financial and technical support to acquire a sustainable source of feed for their livestock.
Biodiversity, renewable resources and ecosystem services	Destruction of vegetation and displacement of wildlife	Site clearing will lead to the destruction of some common vegetation, a few trees and destruction of the habitats of some animals.	Local	Permanent	Weak	Moderate	• Clear only area required for the project • Stray animals that are observed at or around project sites should be given safe passage to nearby bush and not killed. • Hunting and or killing of wildlife/animals in bushes around project site by construction/other workers should be prohibited and made punishable.

Preparatory Phase Negative Impacts

Land related disputes

The project communities are largely rural communities with land ownership and tenurial arrangements that have to be followed. However, some farmers or individuals in order to be considered for project support may hurriedly acquire lands without following due process. This could result in ownership being contested especially if there is an ongoing land dispute resulting in a protracted dispute that could have some security implications.

Ownership of land should be made a requirement for qualification as a project beneficiary and evidence of ownership should be produced and documented. For lands without deeds, family or community consent should be obtained and documented before project is implemented.

Restricted access to pastures

Rearing of animals is a key economic activity in the project communities and animals such as cattle, sheep, and goat graze on surrounding vegetated lands. However, project activities such as land clearing and levelling could restrict locals access to lands that were otherwise used as pasture areas. Considering that there are vast adjoining uncultivated lands, herdsmen can still cut and carry grass to feed their animals. The impact is therefore local and the displacement will be temporary as alternative sites and resources exist making this impact moderately significant.

Identification and proposal of alternative pasture areas to locals and herdsmen who otherwise used the project site as pasture area will help reduce the impact of restricted access. Herdsmen should be encouraged to cut and carry grass to feed their animals to avoid any potential disputes over access.

Destruction of vegetation and displacement of wildlife

Site clearing for soil suitability assessments and land preparation will lead to the destruction of some common vegetation, mostly shrubs and grasses, and a few trees. As required by the project, beneficiary farmers must own vast lands (>100 ha) and clearing of such vast areas could adversely affect vegetation including economic trees like shea and dawadawa. Habitats of common soil organisms such as dung beetle and earthworms will also be destroyed. However, the area, especially in the dry season, has very sparse vegetation and little fauna hence impact on vegetation will only be moderate.

To mitigate the impact of vegetation loss from clearing, only area required for project be cleared. Vegetation clearing should be carried out in the dry season, just before the rainy season, when very few plants will be affected. Economic trees such as dawadawa and shea should be avoided during clearing, if possible. Stray animals that are observed at or around project sites should be given safe passage to nearby bush and not killed. Hunting and or killing of wildlife/animals in bushes around project site by construction/other workers should be prohibited and made punishable.

6.8.2 Construction Phase: Major and moderate adverse impacts and specific measures

The construction phase major and moderate adverse impacts are provided in **Table 6-3.**

Table 6- 3: Construction Phase Potential Adverse Impacts

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
Pollution prevention and control, hazardous materials and resource efficiency	Soil erosion	Excavation for foundation of structures could lead to soil erosion and creation of gullies through runoff especially in the rainy season	Local	Temporary	Average	Moderate	• Landscape should be reinstated or regenerated to reflect its original general view before the project. • All excavations and trenches should immediately be backfilled and compacted to its original state.
	Air Pollution	Emission of fumes and dust from transport of materials especially on untarred routes to project site	Local	Temporary	Average	Moderate	• Trucks and heavy machinery with a valid emission test pass certificate should only be allowed on the project site. • Dust pollution must be reduced by ensuring that drivers do not speed especially on untarred roads. • Suppress dust by watering dusty construction areas. • Ensure the use of nose mask in dusty environment.
	Water Pollution	Sediment and waste oil transport into nearby water bodies	Local	Temporary	Average	Moderate	• Conduct regular maintenance on trucks to prevent oil leakages that could be washed together with sediment into nearby waterbodies

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• Manage leaked oil by placing trays under trucks to collect leaked oil.
		Domestic waste from the construction workers and food vendors to the construction crew	Local	Temporary	Average	Moderate	• Provide bins for collection of solid waste • Educate workers on the importance of waste management
	Noise and Vibration	Operation of construction equipment, movement of haulage vehicles and tooting of horns	Local	Temporary	Average	Moderate	• Unnecessary tooting of horn by truck drivers must be avoided. • A noise assessment must be carried out for all heavy machinery prior to use at the site to ensure noise levels are in compliance with EPA's guidelines values. • Noise should be kept to a minimum with hearing protection used as deemed necessary for workers. Earmuffs or earplugs are recommended for ear protection. The level of noise must be continuously assessed to keep it within acceptable limits. • All equipment and tools must be checked for suitability for the task. • All construction equipment and hand tools should be operated by trained, experienced and competent persons, and where

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							required persons must produce operator's license upon request. • Ensure the use of well serviced/maintained vehicles and other equipment with acceptable noise emission levels. • Provide silencers on all noise generating equipment.
	Waste generation and inefficient management	Clearance of vegetation at project site, construction debris, pieces of steel/metal, packaging materials, plastic pieces, human waste etc. if not disposed properly could clog drains and facilitate the outbreak of sanitary related diseases such as cholera Inefficient waste management during construction, operation and maintenance of equipment leading to excess consumption of materials, generation of wastes/emissions, pollution of soils and water.	Local	Temporary	Strong	Major	• Ensure that construction debris are collected from work sites to avoid blocking of drains and waterways. • Waste bins must be provided and well labelled for waste segregation and disposal. • Only licensed waste management companies must be engaged to collect and dispose of waste collected from the site. • Regular briefing or training on waste management must be provided to workers at the site. • Have SOPs for managing hazardous and non-hazardous waste.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
Labour conditions, health and safety	Workplace incidents/accidents	Workplace and traffic accidents/incidents and animal/insect threat/bites	Local	Temporary	Strong	Major	• Good housekeeping around work area must be ensured to prevent slips, trips & falls. • Only trained and competent workers should be allowed to carry out work and must be well briefed on safe working procedures. • Appropriate work platforms and PPE must be used for specific tasks such as work at height. • Mandatory and basic PPE including hardhat, hand gloves, safety goggles, HiVis and safety boots must be worn. • Have accident and incident reporting form available to record accidents and near-misses
	Poor labour working conditions	Lack of employment contracts could lead to workers being paid rates below the stipulated national minimum wage or work under poor conditions. Workers could face issues of discrimination, forced labour, child labour, freedom of association and collective bargaining, lack of or	Local	Temporary	Average	Moderate	• Provide all workers with signed contracted that are consistent with national labour laws • Provide welfare facilities such as potable drinking water, shades, restrooms etc. for workers. • Encourage frequent breaks and job-rotation to reduce impact of the weather on workers.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
		ineffective worker grievance redress mechanisms					• Require workers to sign Code of Conduct and provide adequate training to both the workers and the communities • Develop policies against discrimination, forced and child labour, sexual harassment and all forms of abuse including restriction of right to unionize or freedom of speech. • Establish an effective worker grievance redress mechanism
	Traffic accident risks	Transport of materials and equipment to and from the project site through communities and townships raises traffic/public safety concerns. Broken-down, inappropriately parked or slow-moving haulage/construction trucks could lead to road accidents and traffic congestion especially on busy roads.	Local	Temporary	Average	Moderate	• The highway code must be strictly followed. Driver training must be provided as part of induction training and permit to drive and transportation of materials to project site issued. • Trained flagmen (to slow down traffic) or trained stop-go men (to halt traffic) must be used to ensure safety when trucks are leaving the project site. • Stop-go men and flagmen must also wear high visibility vests and use approved stop-go signs or flags. • Vehicles to be used on the project must provide maintenance records, and must also be inspected by a competent person before allowed on the project.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• Have checklists available to manage vehicle and equipment maintenance and management • Arrangements must be made for truck drivers to ensure peak times are avoided for haulage of materials to site. • Ensure that all trucks used are serviced regularly to maintain optimal performance and ensure safety. • Identify safe parking areas off main roads to allow for unloading and long-term parking of vehicles. • Have accident and incident reporting form to record accidents and near-misses.
	Fire outbreak	Fire outbreaks from negligence of workers or the public burning refuse, game hunting and workers not properly extinguishing stubs of cigarette. These fires could spread causing injuries to persons and destruction of property.	Local	Temporary	Average	Moderate	• Create fire belts around project site to deal with any fire incidents • Liaise with the Fire Service to sensitize workers and the community on fire risks • Secure fire extinguishers for fire fighting

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
	Gender based violence	Presence of workers and increase in incidents of rape, defilement and GBV	Local	Temporary	Average	Moderate	• Include in works contract clauses on mandatory and regular training for workers on required lawful conduct and legal consequences for failure to comply with laws on non-discrimination and GBV • Insert clause requiring contractors and consultants to cooperate with law enforcement agencies investigating cases of gender-based violence • A minimum requirement of female employment should be indicated in contract documents • Clauses prohibiting rape, defilement and other Gender based Violence as well as child and forced labour should be inserted into works contracts • Contact numbers of representative on the Grievance Redress Committee and GBV Service Providers should be pasted around the project site and within the immediate project zone • Discuss issues of Gender Based Violence at daily Toolbox meetings • Display on site posters prohibiting sexual exploitation and harassment

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
	Public health issues	Pollution of local water bodies will adversely affect the health of users	Local	Temporary	Average	Moderate	• Point source treatment of pollutants
		Sexual relations between workers and locals may bring about increase in sexually transmitted diseases including HIV/AIDs. Interactions between workers and locals could also lead to the spread of COVID-19.	Local	Temporary	Average	Moderate	• Provide information, instructions and trainings on STDs, drug abuse etc. to the workers to create awareness. • Provide female and male condoms to the community and workers. • Conduct daily temperature screening of workers and visitors. • Provide handwashing stations and sanitizers at all sites. • Ensure workers and visitors adhere to all COVID-19 protocols including wearing of face mask and social distancing. • Encourage workers to get vaccinated. • Organize trainings on COVID-19 and STDs for the workers and the community to create awareness. • Provide condoms to the community and workers.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
	Security concerns	Violent behaviour and confrontations between workers and locals. Workers who are deemed to be financially sound could be victims of theft and burglary Potential conflict over illicit sexual affairs, child labour, drunk driving, accidents and destruction of property.	Local	Temporary	Average	Moderate	• Provide adequate security by liaising with Police to conduct regular patrols or make private security arrangement • Sensitize local community on cultural tolerance and grievance mechanisms to prevent confrontations

Construction and Operation Phase Negative Impacts

Soil degradation

Construction

Levelling, as part of land preparation, and excavation for foundation of structures such as sheds and warehouses could lead to soil erosion and creation of gullies through runoff especially in the rainy season. Also, oil spillages from the maintenance of construction equipment and vehicles could contaminate soils and affect flora and soil fauna including dung beetles and earthworms. As there are vast adjoining lands, excavated spoils from land levelling could be pushed into other tracts of land creating unsightly scenes. The impact is largely localized, persistent and of average severity hence it is considered moderate.

However, with measures such as reinstatement of excavated areas, maintenance of vehicles, machines and fuel refilling at a designated area, contamination of soil can be avoided. Fuel storage and refilling sites should be kept away from drains and important water bodies. All spoils shall be disposed of as desired, and the site shall be fully cleaned before handing over. These measures are expected to minimize the impact on soil.

Operation

Leaving farmlands bare especially after harvesting could expose the soil to wind erosion from the strong winds in the dry season. Leaked or spilled oils from maintenance/operation of equipment and vehicles could contaminate soil and adversely affect soil fauna. Also, contaminated soil could be washed into nearby waterbodies via runoff. However, this impact is localized and of average severity hence considered moderate in significance.

Farmlands should be kept always vegetated to prevent sheet erosion from strong winds. Drains must be created to properly channel runoff. An area should be designated for maintenance of vehicles and spill kits provided for accidental spillages.

Air Pollution

Construction

Land preparation and use of un-serviced/unmaintained vehicles for the transport of materials on untarred roads will lead to emission of particulate matter i.e., dust and fumes and adversely affect air quality, especially in the dry season. The impact on air quality is likely to be considerable especially when particulate matter is carried over some distance by winds like the harmattan winds that characterize the climate of the project area. However, any possible impacts will be temporary hence the significance will be moderate.

Construction vehicles and equipment should be maintained regularly to reduce their emissions and engine idling should be discouraged. Water should be sprinkled on cleared areas and all areas that have loose soil and the potential for dust pollution to suppress dust.

Operation

At the operation stage, fumes and dust generated by equipment and vehicles could reduce the quality of air in beneficiary, neighbouring communities, and communities along haulage routes. Sensitive receptors such as persons with allergies and upper respiratory tract diseases could experience aggravation of their condition. This impact is temporary but could be regional in extent and considered moderate.

Mitigation measures include regular maintenance of equipment and vehicles, discouraging engine idling and institution of speed limits for drivers.

Water Pollution

Construction

Disposal of domestic waste from construction workers and food vendors and deposition of sediment, waste oil, fertilizer, and pesticides via runoff into nearby water bodies will reduce the quality of water and could also smother some fishes and benthic organisms. Waterbodies and water sources that serve the area, including White Volta, Gbere, Kpalsako, Sitande, Biringu, Lamboya, Tilli, Zongoire, Farik, Widnaba, Gundago, Yarigu, Kpantarigu are just about 0.5km to 2.0km away from project communities. These waterbodies could be the direct recipient or indirect recipient of pollutants from farms. The impact severity is average, it is localized and temporary hence considered moderate in significance.

A waste management plan should be developed by the contractor to segregate, collect, and dispose of waste to prevent indiscriminate disposal of waste. Maintenance of equipment and vehicle should be done at designated areas with spill kits and drip trays provided to manage spillages.

Operation

Domestic wastes, poultry waste, workforce sewage/effluent, as well as runoff from cultivated land (containing fertilizers, pesticides, and herbicides etc.) could pollute surface water. Nutrient loading from fertilizers could lead to eutrophication and reduce the water quality making it unsuitable for use.

Wastes should be segregated in designated waste bins and collected regularly by a licensed waste collector. Disposal of wastes near water bodies should be avoided. Prepare an Integrated Pest/Vector Management Framework/Plan to address the impacts on receptors such as waterbodies, beneficiary organisms, humans and animals, insects, fishes, etc. from the expanded use of agrochemicals, including inorganic fertilizers for growth improvement and pesticides against the spread of pests and diseases.

Noise and Vibration

Construction

Operation of construction equipment, movement of haulage vehicles and tooting of horns. Construction activities are anticipated to produce noise levels in the range of 80 - 95 dB (A). The construction equipment will have high noise levels, which can affect the personnel operating the machines as well as the residents within the project community or nearby communities.

Use of proper Personal Protective Equipment (PPE) such as earmuffs will mitigate any adverse impact of the noise generated by such equipment on workers. Equipment and vehicles will be maintained regularly to reduce noise levels. Also, construction activities will not be carried out during the night to reduce the impact of noise on residents and other sensitive receptors.

Operation

Noise and vibration from operation of processing equipment, equipment maintenance, movement of haulage vehicles, tooting of horns and noise from the poultry birds could be a nuisance to persons within the project community or nearby communities.

Waste generation and inefficient management

Construction

Clearance of vegetation and levelling of land at project site will generate vegetative waste and excavated spoil. Other wastes such as construction debris, pieces of steel/metal, packaging materials, plastic pieces, human waste, etc. if not disposed properly could clog drains, produce foul smell, and facilitate the outbreak of sanitary related diseases such as cholera. The impact is local, temporary and of a high intensity hence considered major in significance.

A waste management plan should be developed by the contractor to segregate, collect and dispose of waste to prevent indiscriminate disposal of waste. Segregation of waste such as domestic i.e., food packaging and hazardous waste i.e., containers of pesticides and herbicides should be practiced, and waste collected by licensed waste collectors Maintenance of equipment and vehicle should be done at designated areas with spill kits and drip trays provided to manage spillages.

Operation

Improper disposal of vegetative waste from weeding, harvests, domestic waste from workers and effluent from installations could create unsightly scenes and aid in the production of vermin. Also, it could serve as breeding grounds for disease causing vectors like mosquitoes, houseflies, etc.

Provide bins and skips for waste collection and ensure it is disposed of regularly. Educate workers, vendors, and visitors on the importance of proper waste management.

Workplace incidents/accidents

Workers could be exposed to workplace and traffic-related accidents/incidents as well as animal/insect threat/bites during land preparation, civil works and transportation of materials or persons.

Injuries resulting from falling from heights and falling objects, as well as from the misuse of equipment and tools, cuts from stepping on sharp objects such as nails and other metal off-cuts and injuries resulting from clashes between vehicles and the workers as they both operate within the same space are likely to occur during the implementation of the project.

This impact is considered significant since it affects human lives and would therefore require adequate mitigation measures. Occupational health and safety risks are rated highly sensitive because they could/may lead to mortality and long-term morbidity involving site workers. It is, however, localised small scale and short term, implying its magnitude is low. In terms of significance Occupational Health and Safety risks are considered a moderately significant risk, though it has a low magnitude of impact because of its high sensitivity.

To mitigate this impact, the contractor should prepare an Occupational, Health and Safety plan and ensure compliance onsite.

Poor labour working conditions

Lack of employment contracts could lead to workers being paid rates below the stipulated national minimum wage or work under poor conditions. Workers could also be victims of discrimination, forced labour, child labour, restriction of freedom of association and collective bargaining, a non-existent or ineffective worker grievance redress mechanism. Poor Labour working conditions is rated moderate scale, localised and short term, hence low magnitude of impact. It is also highly sensitive since subjecting employees to poor conditions of service and working conditions are against Ghana's labour laws such as Labour Act 2003 (Act 651). Hence this impact is moderately significant.

Provide all workers with signed contracts that are consistent with national labour laws as well as welfare facilities such as potable drinking water, shades, restrooms, etc. Encourage frequent breaks and job-rotation to reduce impact of the weather on workers. Also, policies including codes of conduct should be developed against discrimination, forced and child labour, sexual harassment, and abuse. Workers should be allowed to unionize, and an effective grievance redress mechanism established to address worker grievances.

Traffic accident risks

Transport of materials and equipment to and from the project site through communities and townships raises traffic/public safety concerns. Broken-down, inappropriately parked, or slow-moving haulage/construction trucks could lead to road accidents and traffic congestion especially on busy roads. At night, due to poor or low visibility, there is a high probability of road accidents. Though temporary, this is considered major as it is regional in extent and of high severity because it could result in fatality.

To avoid or reduce road traffic accidents and incidents, only qualified drivers should be used, vehicles must be maintained regularly to ensure that they are in good working condition, use of signs as appropriate and driving at night should be discouraged. Also, speed limits must be set to ensure safe driving e.g., 20km/h onsite, 40km/h on approaching communities along haulage routes and a maximum speed of 100km/h on highways.

Fire outbreak

Fire outbreaks from negligence of workers or the public burning refuse, game hunting and workers not properly extinguishing stubs of cigarette. Fire out breaks may also emanate from power surges or the use of sub-standard electrical cables and sockets. These fires could spread causing injuries or death to persons

and destruction of property. Community health and safety risks on the site are rated regional, short term and small scale; low magnitude but highly sensitive because they lead to mortality and long-term morbidity. Hence such impacts are moderately significant.

Gender based violence

Workers with relatively high incomes will be working on the various sites. The site workers can lure girls, hawkers, food vendors, other petty traders who supply them food and other services and defile or rape them. Workers may also abuse themselves and/or supervisors.

Sexual favours could be demanded in exchange for jobs, promotion, or other work-related benefits. Women may also be discriminated against, denied employment opportunities and /or their services may be undervalued based on cultural norms. The incidence of GBV is short-term and small-scale hence considered moderate.

To prevent incidences of GBV, legal processes set out by national law must be followed. Policies on SEA/SH should be developed and implemented. Worker contracts should have clauses prohibiting rape, defilement, sexual harassment, child/forced labour and other GBV. An employment quota should be allocated to women. Contact numbers of representative on the Grievance Redress Committee and GBV Service Providers should be pasted around the project site and within the immediate project zone.

Public health issues

Dust borne communicable diseases, respiratory infections and minor throat and eye irritations are expected, especially during the dry season because of the emission of vehicular pollutants and dust (carbon monoxide and particulates). The presence of workers and related increase in disposable cash makes the transmission of STDs a possibility. During project execution (civil works), large numbers of workers will be required to assemble in meetings, and even at work sites; varied number of workforces including suppliers of material and services are also expected to come in from various places which may be COVID-19 hot spots; and interaction of workers with the project host community. The potential for the spread of any infectious disease like COVID-19 is high.

Improper waste management may create conditions for the growth of vectors of diseases such as cholera and dysentery. The outbreak of these diseases would have far-reaching negative implications for the health of residents and put pressure on the limited health facilities in the area.

An awareness and sensitization campaign together with responsible government agencies like National AIDS Commission should ensure that the people in the project area (workers and locals) are made aware of the issues and provided with condoms. Conduct daily temperature screening of workers and visitors for COVID-19.

Security concerns

Civil works can be associated with theft and pilfering of construction materials normally from the public and site workers. Site workers can also steal from private properties within the immediate project zone.

Other crimes include illicit sexual affairs, child labour and drunk driving, which are criminal under the laws of Ghana.

There may also be confrontations arising out of accidents and destruction of property by workforce, equipment, or vehicles. This impact is localized, severe but temporary hence considered moderate.

Workers and local community should be sensitized on cultural tolerance and grievance mechanisms to prevent confrontations. Workers should be made to sign and adhere to a code of conduct which prohibits vices.

6.8.3 Operation Phase: Major and moderate adverse impacts and specific measures

The operation phase major and moderate adverse impacts are provided in **Table 6-4.**

Table 6- 4: Operation Phase Potential Adverse Impacts

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
Pollution prevention and control, hazardous materials and resource efficiency	Soil erosion	Leaving farmlands bare especially after harvesting could expose the soil to wind erosion from the strong winds in the dry season	Local	Temporary	Average	Moderate	• Landscape should be reinstated or regenerated to reflect its original general view before the project. • All excavations and trenches should immediately be backfilled and compacted to its original state.
	Air Pollution	Emission of fumes/dust from haulage of materials and equipment especially on untarred routes to farms or agricultural establishments	Local	Temporary	Average	Moderate	• Trucks and heavy machinery with a valid emission test pass certificate should only be allowed on the project site. • Dust pollution must be reduced by ensuring that drivers do not speed especially on untarred roads. • Suppress dust by watering dusty construction areas. • Ensure the use of nose mask in dusty environment.
	Water Pollution and over abstraction	Sediment and waste oil transport into nearby water bodies	Local	Temporary	Average	Moderate	• Conduct regular maintenance on trucks to prevent oil leakages that could be washed together with sediment into nearby waterbodies

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• Manage leaked oil by placing trays under trucks to collect leaked oil. • Monitor volumes of water used and keep records • Promptly fix faulty or leaking pipes to preserve water • Develop a participatory water management plan
	Pollution of Soils and Water	Pollution of watercourses caused by wastes workforce sewage effluent, as well as runoff from land used for growing maize (containing fertilisers, pesticides, and herbicides etc.).	Local	Temporary	Average	Moderate	• Point source treatment • Prepare an Integrated Pest/Vector Management Framework/Plan to address the impacts on receptors such as waterbodies, beneficiary organisms, humans and animals, insects, fishes, etc. from the expanded use of agrochemicals, including inorganic fertilizers for growth improvement and pesticides against the spread of pests and diseases.
	Odours	Odours associated with poultry and waste may have nuisance value for nearby receptors i.e. residents.	Local	Temporary	Average	Moderate	• Sensitive site selection, and siting of construction works and access roads. • Use of modern equipment, meeting appropriate emissions standards, and regular preventative maintenance.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• Implement measures to increase efficiency of vehicle use, aiming to reduce the number of journeys and vehicles required. • No use of ozone depleting substances during construction or operation. • Dust and odour control and suppression measures, such as dampening and use of vegetation hedges. • Implement appropriate waste disposal measures
	Noise and Vibration	Noise and vibration from operation of processing equipment, equipment maintenance, movement of haulage vehicles and tooting of horns and noise from the poultry birds	Local	Temporary	Average	Moderate	• Unnecessary tooting of horn by truck drivers must be avoided. • A noise assessment must be carried out for all heavy machinery prior to use at the site to ensure noise levels are in compliance with EPA's guidelines values. • Noise should be kept to a minimum with hearing protection used as deemed necessary for workers. Earmuffs or earplugs are recommended for ear protection. The level of noise must be continuously assessed to keep it within acceptable limits.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• All equipment and tools must be checked for suitability for the task. • All equipment and hand tools should be operated by trained, experienced and competent persons, and where required persons must produce operator's license upon request. • Ensure the use of well serviced/maintained vehicles and other equipment with acceptable noise emission levels. • Provide silencers on all noise generating equipment.
	Waste generation and disposal	Improper disposal of waste i.e. packaging, refuse and effluent from installations could clog drains and facilitate the outbreak of sanitary related diseases such as cholera and malaria	Local	Temporary	Average	Moderate	• Waste bins must be provided and well labelled for waste segregation and disposal. • Only licensed waste management companies must be engaged to collect and dispose of waste collected from the site. • Regular briefing or training on waste management must be provided to workers at the site. • Have SOPs for managing hazardous and non-hazardous waste.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
	Inefficient waste management	Inefficient waste management during operation and maintenance leading to excess consumption of materials, generation of wastes/emissions, pollution of soils and water.	Local	Temporary	Average	Moderate	• Materials handling and control procedures, use of appropriate • storage and containment equipment. • Control of vehicle movements and prohibition of vehicle washing in • watercourses, and similar practices • • Emergency response plans during construction (contractors and local authorities) and operation (local authorities).
Labour conditions, health and safety	Workplace accidents and incidents	Workplace and traffic accidents/incidents and animal/insect threat/bites Incidence of transmission of H1NI virus from poultry to the workforce	Local	Temporary	Strong	Major	• Good housekeeping around work area must be ensured to prevent slips, trips & falls. • Only trained and competent workers should be allowed to carry out work and must be well briefed on safe working procedures. • Appropriate work platforms and PPE must be used for specific tasks such as work at height. • Mandatory and basic PPE including hardhat, hand gloves, safety goggles, HiVis and safety boots must be worn.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• Have accident and incident reporting form available to record accidents and near-misses • Vaccinate birds against diseases
	Poor labour working conditions	Lack of employment contracts could lead to workers being paid rates below the stipulated national minimum wage or work under poor conditions. Workers could be exposed to discrimination, forced and child labour, restriction of freedom of association and collective bargaining, non-existent or ineffective worker grievance redress mechanism	Local	Temporary	Average	Moderate	• Provide all workers with signed contracted that are consistent with national labour laws • Provide welfare facilities such as potable drinking water, shades, restrooms etc. for workers. • Encourage frequent breaks and job-rotation to reduce impact of the weather on workers. • Develop policies against discrimination, forced and child labour, sexual harassment and all forms of abuse including restriction of right to unionize or freedom of speech. • Establish an effective worker grievance redress mechanism
	Traffic impact	Transport of materials and equipment to and from the project site through communities and townships raises traffic/public	Local	Temporary	Average	Moderate	• Ensure all visitors accessing site are in appropriate PPE • The highway code must be strictly followed. Driver training must be provided

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
		safety concerns. Broken-down, inappropriately parked or slow-moving haulage trucks could lead to road accidents and traffic congestion especially on busy roads.					as part of induction training and permit to drive and transportation of materials to project site issued. • Trained flagmen (to slow down traffic) or trained stop-go men (to halt traffic) must be used to ensure safety when trucks are leaving the project site. • Stop-go men and flagmen must also wear high visibility vests and use approved stop-go signs or flags. • Vehicles to be used on the project must provide maintenance records and must also be inspected by a competent person before allowed on the project. • Have checklists available to manage vehicle and equipment maintenance and management • Arrangements must be made for truck drivers to ensure peak times are avoided for haulage of materials to site. • Appropriate warning signs are put in place, as required. • Ensure that all trucks used are serviced regularly to maintain optimal performance and ensure safety.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• Identify safe parking areas off main roads to allow for unloading and long-term parking of vehicles. • Have accident and incident reporting form to record accidents and near-misses.
	Fire outbreak	Fire outbreaks from negligence of workers or the public burning refuse, game hunting and not properly extinguishing stubs of cigarette. These fires could spread causing injuries to persons and destruction of property.	Local	Temporary	Average	Moderate	• Create fire belts around project site to deal with any fire incidents • Liaise with the Fire Service to sensitize workers and the community on fire risks • Secure fire extinguishers for fire fighting
	Gender based violence	Presence of workers and increase in incidents of rape, defilement and GBV	Local	Temporary	Average	Moderate	• Let workers sign a Code of Conduct alongside the contract that workers sign • Include in workers' contract clauses on mandatory and regular training for workers on required lawful conduct and legal consequences for failure to comply with laws on non-discrimination and GBV • Insert clause requiring contractors and consultants to cooperate with law enforcement agencies investigating cases of gender-based violence

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• A minimum requirement of female employment should be indicated in contract documents • Clauses prohibiting rape, defilement and other Gender based Violence as well as child and forced labour should be inserted into works contracts • Contact numbers of representative on the Grievance Redress Committee and GBV Service Providers should be pasted around the project site and within the immediate project zone • Discuss issues of Gender Based Violence at daily Toolbox meetings • Display on site posters prohibiting sexual exploitation and harassment
	Public health issues	Pollution of local water bodies will adversely affect the health of users	Local	Temporary	Weak	Minor	• Ensure point source treatment
		Sexual relations between workers and locals may bring about increase in sexually transmitted diseases including HIV/AIDs.	Local	Temporary	Weak	Moderate	• Provide information, instructions and trainings on STDs, drug abuse etc. to the workers to create awareness. • Provide female and male condoms to the community and workers.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
		Interactions between workers and locals could also lead to the spread of COVID-19. Incidence of outbreak of H1N1 virus from poultry to humans					• Conduct daily temperature screening of workers and visitors. • Provide handwashing stations and sanitizers at all sites. • Ensure workers and visitors adhere to all COVID-19 protocols including wearing of face mask and social distancing. • Encourage workers to get vaccinated. • Organize trainings on COVID-19 and STDs for the workers and the community to create awareness. • Provide condoms to the community and workers.
	Security concerns	Violent behaviour and confrontations between workers and locals. Workers who are deemed to be financially sound could be victims of theft and burglary Potential conflict over sexual affairs, child labour, drunk driving, accidents, and destruction of property.	Local	Temporary	Average	Moderate	• Provide adequate security by liaising with Police to conduct regular patrols or make private security arrangement • Sensitize local community on cultural tolerance and grievance mechanisms to prevent confrontations • Adoption of a Stakeholder Engagement Plan, as a framework for • early and ongoing community consultation. • Implementation of a Grievance Redress Mechanisms.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• Works procedures, defining a Code of Appropriate Conduct for all workers, including acceptable behaviour with respect to community interactions.

Cumulative Negative Impacts of the Project

Cumulative impacts are the combined, incremental effects of human activity that pose a serious threat to the environment. Cumulative environmental impacts result from many different, often individually insignificant, effects. They are usually neither measured nor accounted for before they cause significant damage through accumulation.

In the medium to long term, the project implementation is likely to have some cumulative impacts including

- Surface water pollution as a result of runoff carrying waste including refuse, sewage, remnant pesticides/weedicides/fertilizers, poultry waste, waste oils into nearby water bodies
- Contamination of groundwater from mismanagement of boreholes and wells for irrigation and other uses
- Waste generation from multiple sources, and multiple waste and dumping sites from uncoordinated waste management.

Mitigation measures for these impacts include careful design, implementation of the ESMP, and ensuring compliance through monitoring to confirm that activities and their outputs meet permissible limits (e.g., air emissions, chemical use, effluent treatment) under national law and international best practice.

7.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

This section presents the Environmental and Social Management Plan (ESMP), **Table 7-1** that is designed to operationalize the environmental and social commitments presented in this ESIA report. The ESMP presents a set of management, mitigation, and monitoring measures to be taken at different stages of the project implementation. It sets out record keeping required to ensure that mitigation measures and monitoring are effective, and results duly communicated to stakeholders.

Table 7- 1: Environmental and Social Management Plan

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
Preparatory Phase							
Restricted access to pasture	Construction	• Site preparation	• Repair or remedy	• Identify and propose alternative pasture areas to locals who otherwise used the project site as pasture area. • Provide locals with some financial and technical support to acquire a sustainable source of feed for their livestock.	PCU	Environmental and Social Safeguards Specialists of PCU	5,000
Destruction of vegetation and displacement of wildlife	Construction	• Site preparation	• Offset	• Clear only area required for the project • Reinstate excavated areas immediately after works to prevent excavated spoil from being transported by runoff into nearby water bodies • Stray animals that are observed at or around project sites should be given safe passage to nearby bush and not killed. • Hunting and or killing of wildlife/animals in bushes around project site by construction/other workers should be prohibited and made punishable.	Works contractor	Environmental Safeguards Specialist of PCU	5,000
Construction Phase							
Soil erosion	Construction	• Project site	• Repair or remedy	• Landscape should be reinstated or regenerated to reflect its original general view before the project. • All excavations and trenches should immediately be backfilled and compacted to its original state.	Works contractor	Environmental Safeguards Specialist of PCU	2,000
Air Pollution	Construction	• Project site and haulage route	• Avoid or reduce at source	• Trucks and heavy machinery with a valid emission test pass certificate should only be allowed on the project site. • Dust pollution must be reduced by ensuring that drivers do not speed especially on untarred roads. • Suppress dust by watering dusty construction areas.	Works contractor	Environmental Safeguards Specialist of PCU	5,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Ensure the use of nose mask in dusty environment.			
Water Pollution	Construction	• Project site	• Avoid at source	• Conduct regular maintenance on trucks to prevent oil leakages that could be washed together with sediment into nearby waterbodies • Manage leaked oil by placing trays under trucks to collect leaked oil.	Works contractor	Environmental Safeguards Specialist of PCU	15,000
Noise and vibration nuisance	Construction	• Equipment and vehicles on site	• Abate on site	• Unnecessary tooting of horn by truck drivers must be avoided. • A noise assessment must be carried out for all heavy machinery prior to use at the site to ensure noise levels are in compliance with EPA's guidelines values. • Noise should be kept to a minimum with hearing protection used as deemed necessary for workers. Earmuffs or earplugs are recommended for ear protection. The level of noise must be continuously assessed to keep it within acceptable limits. • All equipment and tools must be checked for suitability for the task. • All construction equipment and hand tools should be operated by trained, experienced and competent persons, and where required persons must produce operator's license upon request. • Ensure the use of well serviced/maintained vehicles and other equipment with acceptable noise emission levels. • Provide silencers on all noise generating equipment.	Works contractor	Environmental Safeguards Specialist of PCU	5,000
Waste generation and inefficient management	Construction	• Project site	• Abate or reduce at source	• Ensure that construction debris are collected from work sites to avoid blocking of drains and waterways. • Waste bins must be provided and well labelled for waste segregation and disposal.	Works contractor	Environmental Safeguards Specialist of PCU	20,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Only licensed waste management companies must be engaged to collect and dispose of waste collected from the site. • Regular briefing or training on waste management must be provided to workers at the site. • Have SOPs for managing hazardous and non-hazardous waste.			
Workplace accidents/incidents	Construction	• Project site	• Abate on site	• Good housekeeping around work area must be ensured to prevent slips, trips & falls. • Only trained and competent workers should be allowed to carry out work and must be well briefed on safe working procedures. • Appropriate work platforms and PPE must be used for specific tasks such as work at height. • Mandatory and basic PPE including hardhat, hand gloves, safety goggles, HiVis and safety boots must be worn. • Have accident and incident reporting form available to record accidents and near-misses	Works contractor	Environmental Safeguards Specialist of PCU	20,000
Poor labour working conditions	Construction	• Project Site	• Avoid at source	• Provide all workers with signed contracts that are consistent with national labour laws • Include code of conduct into contracts to be signed by workers • Provide welfare facilities such as potable drinking water, shades, restrooms etc. for workers. • Encourage frequent breaks and job-rotation to reduce impact of the weather on workers.	Works contractor	Environmental and Social Safeguards Specialists of PCU	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Require workers to sign Code of Conduct and provide adequate training to both the workers and the communities • Develop policies against discrimination, forced and child labour, sexual harassment and all forms of abuse including restriction of right to unionize or freedom of speech. • Establish an effective worker grievance redress mechanism			
Traffic management/Public safety concerns	Construction	• Project site	• Abate on site	• Hoard project site to prevent unauthorized entry • Ensure all visitors accessing site are in appropriate PPE • The highway code must be strictly followed. Driver training must be provided as part of induction training and permit to drive and transportation of materials to project site issued. • Trained flagmen (to slow down traffic) or trained stop-go men (to halt traffic) must be used to ensure safety when trucks are leaving the project site. • Stop-go men and flagmen must also wear high visibility vests and use approved stop-go signs or flags. • Vehicles to be used on the project must provide maintenance records and must also be inspected by a competent person before allowed on the project. • Have checklists available to manage vehicle and equipment maintenance and management • Arrangements must be made for truck drivers to ensure peak times are avoided for haulage of materials to site. • Appropriate warning signs including reduced speed, “Men at Work”, “No Parking” & hazard triangle must	Works contractor	Environmental and Social Safeguards Specialists of PCU	8,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				be placed beside road facing oncoming traffic and a similar "End" sign after work area. • Ensure that all trucks used are serviced regularly to maintain optimal performance and ensure safety. • Identify safe parking areas off main roads to allow for unloading and long-term parking of vehicles. • Have accident and incident reporting form to record accidents and near-misses.			
Fire outbreaks	Construction	• Project community interactions	• Avoid at source, repair, or remedy	• Create fire belts around project site to deal with any fire incidents • Liaise with the Fire Service to sensitize workers and the community on fire risks • Secure fire extinguishers for fire fighting	Works contractor	Environmental and Social Safeguards Specialists of PCU	20,000
Public health issues	Construction	• Project-community interactions	• Avoid at source	• Provide information, instructions and trainings on STDs, drug abuse etc. to the workers to create awareness. • Provide female and male condoms to the community and workers. • Conduct daily temperature screening of workers and visitors. • Provide handwashing stations and sanitizers at all sites. • Ensure workers and visitors adhere to all COVID-19 protocols including wearing of face mask and social distancing. • Encourage workers to get vaccinated. • Organize trainings on COVID-19 and STDs for the workers and the community to create awareness. • Provide female and male condoms to the community and workers.	Works contractor	Environmental and Social Safeguards Specialists of PCU	15,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
Security concerns	Construction	• Project site	• Abate or reduce at source, abate on site	• Provide adequate security by liaising with Police to conduct regular patrols • Sensitize local community on cultural tolerance and grievance mechanisms to prevent confrontations	Works contractor	Environmental and Social Safeguards Specialists of PCU	10,000
Gender based violence	Construction	• Project and community interaction	• Avoid at source, repair or remedy	• Let workers sign a code of conduct as annex to the contract. • Include in works contract clauses on mandatory and regular training for workers on required lawful conduct and legal consequences for failure to comply with laws on non-discrimination and GBV • Insert clause requiring contractors and consultants to cooperate with law enforcement agencies investigating cases of gender-based violence • A minimum requirement of female employment should be indicated in contract documents • Clauses prohibiting rape, defilement and other Gender based Violence as well as child and forced labour should be inserted into works contracts • Contact numbers of representative on the Grievance Redress Committee and GBV Service Providers should be pasted around the project site and within the immediate project zone • Discuss issues of Gender Based Violence at daily Toolbox meetings • Display on site posters prohibiting sexual exploitation and harassment	Works contractor	Environmental and Social Safeguards Specialists of PCU	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
Operation Phase							
Soil erosion	Operation	• Facility site	• Avoid or reduce at source	• Landscape should be reinstated or regenerated to reflect its original general view before the project. • All excavations and trenches should immediately be backfilled and compacted to its original state.	Facility manager	EPA, Agric Department, District Assembly EHU	5,000
Air Pollution	Operation	• Facility site	• Avoid or reduce at source	• Trucks and heavy machinery with a valid emission test pass certificate should only be allowed on the project site. • Dust pollution must be reduced by ensuring that drivers do not speed especially on untarred roads. • Suppress dust by watering dusty construction areas. • Ensure the use of nose mask in dusty environment.	Facility manager	EPA, Agric Department, District Assembly EHU	10,000
Water Pollution	Operation	• Facility site	• Avoid at source	• Conduct regular maintenance on trucks to prevent oil leakages that could be washed together with sediment into nearby waterbodies • Manage leaked oil by placing trays under trucks to collect leaked oil. • Monitor volumes of water used and keep records • Promptly fix faulty or leaking pipes to preserve water	Facility manager	EPA, Agric Department, District Assembly EHU	7,000
Noise Nuisance	Operation	• Facility site	• Avoid or reduce at source	• Unnecessary tooting of horn by truck drivers must be avoided. • A noise assessment must be carried out for all heavy machinery prior to use at the site to ensure noise levels are in compliance with EPA's guidelines values. • Noise should be kept to a minimum with hearing protection used as deemed necessary for workers. Earmuffs or earplugs are recommended for ear protection. The level of noise must be continuously assessed to keep it within acceptable limits.	Facility manager	EPA, Agric Department, District Assembly EHU	8,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• All equipment and tools must be checked for suitability for the task. • All equipment and hand tools should be operated by trained, experienced and competent persons, and where required persons must produce operator's license upon request. • Ensure the use of well serviced/maintained vehicles and other equipment with acceptable noise emission levels. • Provide silencers on all noise generating equipment.			
Waste generation and inefficient management	Operation	• Facility	• Reduce at source	• Waste bins must be provided and well labelled for waste segregation and disposal. • Only licensed waste management companies must be engaged to collect and dispose of waste collected. • Regular toolbox talk on waste management must be provided to operatives/workers at the facility. • Have SOPs for managing hazardous and non-hazardous waste.	Facility manager	EPA, Agric Department, District Assembly EHU	20,000
Poor labour working conditions	Operation	• Facility site	• Avoid at source	• Provide all workers with signed contracts that are consistent with national labour laws • Include code of conduct into contracts to be signed by workers • Provide welfare facilities such as potable drinking water, shades, restrooms etc. for workers. • Encourage frequent breaks and job-rotation to reduce impact of the weather on workers. • Require workers to sign Code of Conduct and provide adequate training to both the workers and the communities	Facility manager	Agric Department, District Assembly EHU	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Develop policies against discrimination, forced and child labour, sexual harassment and all forms of abuse including restriction of right to unionize or freedom of speech. • Establish an effective worker grievance redress mechanism			
Traffic management/Public safety concerns	Operation	• Facility	• Abate on site	• Ensure all visitors accessing site are in appropriate PPE • The highway code must be strictly followed. Driver training must be provided as part of induction training and permit to drive and transportation of materials to project site issued. • Trained flagmen (to slow down traffic) or trained stop-go men (to halt traffic) must be used to ensure safety when trucks are leaving the project site. • Stop-go men and flagmen must also wear high visibility vests and use approved stop-go signs or flags. • Vehicles to be used on the project must provide maintenance records and must also be inspected by a competent person before allowed on the project. • Have checklists available to manage vehicle and equipment maintenance and management • Arrangements must be made for truck drivers to ensure peak times are avoided for haulage of materials to site. • Appropriate warning signs are put in place, as required. • Ensure that all trucks used are serviced regularly to maintain optimal performance and ensure safety. • Identify safe parking areas off main roads to allow for unloading and long-term parking of vehicles. • Have accident and incident reporting form to record accidents and near-misses.	Facility manager	EPA, District Assembly EHU	8,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
Fire outbreaks	Operation	• Project community interactions	• Avoid at source, repair or remedy	• Create fire belts around project site to deal with any fire incidents • Liaise with the Fire Service to sensitize workers and the community on fire risks • Secure fire extinguishers for fire fighting	Facility manager	EPA, Fire Service, Agric Department, District Assembly EHU	5,000
Public health issues	Operation	• Project community interactions	• Avoid or reduce at source	• Provide information, instructions and trainings on STDs, drug abuse etc. to the workers to create awareness. • Provide female and male condoms to the community and workers. • Conduct daily temperature screening of workers and visitors. • Provide handwashing stations and sanitizers at all sites. • Ensure workers and visitors adhere to all COVID-19 protocols including wearing of face mask and social distancing. • Encourage workers to get vaccinated. • Organize trainings on COVID-19 and STDs for the workers and the community to create awareness. • Provide condoms to the community and workers.	Facility manager	EPA, Health Directorate, District Assembly EHU	15,000
Security concerns	Operation	• Community	• Avoid or reduce at source	• Provide adequate security by liaising with Police to conduct regular patrols or make private security arrangement • Sensitize local community on cultural tolerance and grievance mechanisms to prevent confrontations	Facility manager	District Security Committee, EPA	8,000
Gender based violence	Operation	• Workers, community	• Avoid or reduce at source, repair and remedy	• Let workers sign code of conduct as an annex to the contract. • Include in works contract clauses on mandatory and regular training for workers on required lawful conduct	Facility manager	EPA, District Social Welfare Department	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				and legal consequences for failure to comply with laws on non-discrimination and GBV • Insert clause requiring contractors and consultants to cooperate with law enforcement agencies investigating cases of gender-based violence • A minimum requirement of female employment should be indicated in contract documents • Clauses prohibiting rape, defilement and other Gender based Violence as well as child and forced labour should be inserted into works contracts • Contact numbers of representative on the Grievance Redress Committee and GBV Service Providers should be pasted around the project site and within the immediate project zone • Discuss issues of Gender Based Violence at daily Toolbox meetings • Display on site posters prohibiting sexual exploitation and harassment			
TOTAL COST OF ESMP IMPLEMENTATION							**256,000**

7.1 ESMP Implementation

7.1.1 Institutional Arrangement and Responsibilities

The institutional arrangement identifies the relevant institutions and actors involved with the implementation of the ESMP, their roles and responsibilities. The main institutions or actors concerned with the implementation of the Project and the ESMP related activities are provided in **Table 7-2**. The ESMP implementation activities will be under the overall guidance of the PCU.

Table 7- 2: Roles and Responsibilities of Key Actors

Key Actors / Institutions	Description of Key Roles/Responsibilities	Duration	Monitoring cost (USD)	Reporting
PCU	• Responsible for project implementation in general. • Have the overall responsibility to ensure that the project implements the construction phase management and monitoring requirements provided in the ESMP. • Responsible for grievance redress procedure and its functioning and effectiveness of other litigation avoidance measures. • Oversee sensitization and awareness programmes. • Grievance Redress	Throughout project implementation	Included in PCU operation cost	Monthly
Ministry of Food and Agriculture	• Project planning and design • Payment of compensations to PAPs, if any • Management of contract award • Compliance monitoring • Grievance redress	Preparatory and construction phases	Part of MoFA Annual Budget	Quarterly
EPA	• Issuing of environmental permit upon review and approval of ESIA • Adhoc monitoring of the sub project to ensure compliance with conditions of the Environmental Permit.	Throughout project implementation	Included in fees paid for permit processing and issuance	Annually
Bawku West Municipal Assembly	• Adhoc monitoring of project during the construction phase • Monitoring facilities during the operational phase of the project to ensure that it is working properly and help resolve operational phase challenges • Grievance Redress	Throughout project implementation	Municipal Assembly Annual Environmental Budget	Annually

Key Actors / Institutions	Description of Key Roles/Responsibilities	Duration	Monitoring cost (USD)	Reporting
Project Consultant and Safeguards Specialist	• Ensure that project execution meets specified environmental, social, health and safety guidelines contained in the contract documents and ESMP • Issue site instructions to Contractors to ensure environmental and social mitigation measures are implemented by contractors • Grievance Redress	Duration of the Preparatory and Construction phases	Included in PCU operation budget	As required
Works Contractors /Sub Contractors	• Contractors for the civil works will be responsible for construction and installations under the project according to project specifications and designs. • Contractors are responsible for reinstatement of all damaged properties. • Contractors are responsible for implementation of the construction phase mitigation measures provided in the ESMP • Responsible for presentation of monthly monitoring report to the PCU • Responsible for remedying defects committed during construction	Construction phase	Included in contractor's BoQ	Monthly
Grievance Redress Committee	• To receive and find solutions to grievances	Preparatory and construction phases	Included in PCU operation budget	Monthly

7.2 Monitoring and Reporting

At the project implementation stage, monitoring will be done to confirm the effectiveness of impact management, including the degree of success in implementing mitigation measures. During construction works, checks, reviews and inspections will be carried out to assess compliance with permit conditions. Monitoring will be done by the relevant institutions, the PCU, Agric Department, EPA, Bawku West District Assembly (BWDA), Fire Service etc. A summary of impacts, mitigation, management, and monitoring measures to be implemented is captured in **Table 7-3**.

E&S Monthly monitoring reports will be prepared by the works contractor and submitted to the PCU, WMA and EPA. The E&S monthly monitoring reports will serve as the basis for EPA's compliance monitoring in line with the permit conditions, and verification of other environmental and social safeguard commitments.

A construction completion report, which is a compilation of outcomes of the monitoring activities, in compliance with EPA's permit conditions and for the records of the District Assembly, will be prepared.

The completion report will form the basis for EPA's final monitoring for project completion and closure. Also, PCU will prepare E&S monthly monitoring reports and share with the lenders to show the extent of compliance with E&S requirements of the EPA and the Bank for the construction period.

7.3 Annual E&S Compliance Audits of the Project and Cost

The Annual Environmental and Social Compliance Audit meets AfDB's ISS requirements. The project having a duration of 5 years, 5 audits will be carried out, including one audit per year. These audits will be carried out by an independent consultant who has not carried out any activity under the project. The terms of reference of the Audit as well as each audit report will be submitted to AfDB for review and approval. The PCU will recruit an independent consultant who will be responsible for carrying out annual environmental and social compliance audits of the sub-project.

It should be noted that the annual audit will concern the entire project, therefore the cost as shown below will cover the consideration of the entire project. Also, the cost of an annual audit is USD 30,000 and this includes the consultant's service cost and reimbursable expenses.

Cost of implementing environmental and social measures

Duration	Materials required for monitoring	No. of audits	Estimated cost of an annual audit (USD)	Total amount (USD)
Once a year	Field vehicle	5	30,000	150,000

Table 7- 3: Environmental and Social Monitoring Plan

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
CONSTRUCTION PHASE						
	Workplace accidents/incidents	• Records of accidents, incidents and near misses. • Records of PPE disbursed • Housekeeping	• Construction site	Monthly	Environmental and Social Safeguards Specialists	5,000
	Poor labour working conditions	• Availability of copies of signed contracts • Human Resource Management Plan/Recruitment Policy • Complaints lodged by workers	• Construction site	Quarterly	Environmental and Social Safeguards Specialists	3,000
	Soil impacts and sediment transport	• Observable change in turbidity of water in drains or water bodies • Observable oil sheen in drain • Observation of rills/gullies	• Construction site and Immediate environs	Monthly	Environmental Safeguards Specialist	4,000
	Air and Noise Pollution	• Dust (PM2.5, PM10 and TSP) • Emissions (NOx, SOx, TSP) • Noise (dB) levels • Number of complaints by residents/workers	• Construction site and Immediate environs	Monthly	Environmental Safeguards Specialist	5,000

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
	Waste generation and disposal impact	• Number of mobile toilets and dustbins provided on site • Number of times waste is lifted in a week i.e. waste transfer notes • Cleanliness of site/housekeeping • Odour • Presence of human waste on site • Complaints by workers/residents	• Construction site and Immediate environs	Weekly	Environmental Safeguards Specialist	3,000
	Traffic management/Public safety concerns	• Grievance records • Traffic related incidents/accidents • Records of accidents, incidents and near misses.	• Construction site and Immediate environs	Monthly	Environmental and Social Safeguards Specialists	5,000
	Fire outbreaks	• Fire related incidents/accidents • Records of fire incidents and near misses. • Number of functional fire extinguishers onsite	• Construction site and Immediate environs	Monthly	Environmental and Social Safeguards Specialists	5,000
	Public health issues	• Number of sensitization campaigns • Number of condoms distributed to Contractor's staff in a month • Number of STD cases reported to local health facilities involving encounters with Contractor's staff	• Construction site and Immediate environs	Monthly	Environmental and Social Safeguards Specialists	4,500
	Security and GBV concerns	• Number of conflicts/cases reported to the Grievance Redress Committee/Community Liaison Officer	• Construction site and Immediate environs	Monthly	Environmental and Social Safeguards Specialists	3,500

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
		• Number of conflicts/cases dealt with by the Grievance Redress Committee • Number of crimes such as theft, defilement and rape reported, investigated, and concluded by the police involving the Contractor's workers				
OPERATIONAL PHASE						
	Workplace accidents/incidents	• Records of accidents, incidents and near misses. • Records of PPE disbursed • Housekeeping	• Facility site	Monthly	HSE Manager	3,000
	Poor labour working conditions	• Availability of copies of signed contracts • Human Resource Management Plan/Recruitment Policy • Complaints lodged by workers	• Facility site	Monthly	HSE Manager and HR Manager	4,000
	Soil impacts and sediment transport	• Observable change in turbidity of water in drains or water bodies • Observable oil sheen in drain • Observation of rills/gullies	• Facility site and immediate environs	Monthly	HSE Manager	5,000
	Air and Noise Pollution	• Dust (PM2.5, PM10 and TSP) • Emissions (NOx, SOx, TSP) • Noise (dB) levels • Number of complaints by residents/workers	• Facility site and immediate environs	Monthly	HSE Manager and Community Liaison Officer	3,000

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
	Waste generation and inefficient management	• Presence of toilets and number dustbins provided on site • Number of times waste is lifted in a week • Cleanliness of site/housekeeping • Odour • Presence of human waste on site • Complaints by workers/residents	• Facility site and immediate environs	Weekly	HSE Manager and Community Liaison Officer	5,000
	Traffic accident risks/Public safety concerns	• Grievance records • Traffic related incidents/accidents • Records of all accidents, incidents and near misses.	• Facility site and immediate environs	Monthly	HSE Manager and Community Liaison Officer	5,000
	Fire outbreaks	• Fire related incidents/accidents • Records of fire incidents and near misses. • Number of functional fire extinguishers onsite	• Facility site and immediate environs	Monthly	HSE Manager and Community Liaison Officer	3,000
	Public health issues	• Number of sensitization campaigns • Number of condoms distributed to workers or placed in washrooms in a month • Prevalence of STD cases reported to local health facilities	• Facility site and immediate environs	Monthly	HSE Manager and Community Liaison Officer	4,500
	Security and GBV concerns	• Number of conflicts/cases reported to the Grievance Redress Committee/Community Liaison Officer	• Facility site and immediate environs	Monthly	HSE Manager and Community Liaison Officer	3,500

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
		• Number of conflicts/cases dealt with by the Grievance Redress Committee • Number of crimes such as theft, defilement and rape reported, investigated, and concluded by the police involving workers or patrons				
	TOTAL COST FOR MONITORING					**74,000**

8.0 DECOMMISSIONING

A Decommissioning and Site Closure Plan (DCP) is required to guard against the remote possibility that the temporary construction structures or infrastructure (such as hatcheries, storage) and equipment used at the operation phase are abandoned. Should such a circumstance arise, the potential would exist for impacts from abandonment of the facility such as aesthetic impacts and potential trespassing and safety concerns. This DCP is being posted to provide a guide on details of the decommissioning activities. The purpose of this conceptual DCP is to describe the general objectives for the post project land use, and the planning processes leading to development of a final DCP.

The specific objectives in managing the decommissioning process will be:

- To ensure that rehabilitation and decommissioning are carried out in a planned sequential manner, consistent with best practice;
- To ensure that agreed post-project land-use outcomes are achieved; and
- To avoid on-going liability

A Full Decommissioning Report is expected to be prepared in the event of any such activity for approval by the EPA and any other requisite state agencies.

8.1 Pre-Decommissioning Assessment

Prior to any decommissioning, the EPA will be notified and an assessment will be carried out to identify any potential environmental impacts that need to be addressed and mitigated in the decommissioning process.

8.2 Decommissioning Phase Activities

8.2.1 Dismantling and Removal of Structures and Equipment

During decommissioning activities, the respective Planning Department and the EPA office shall have access to the site, pursuant to reasonable notice, to inspect the results of complete decommissioning.

The removal of installations, structures, and equipment would include a complete inventory of all hardware and capturing of their final operational status. Disposal of the hardware and documentation would be planned, including any environmental concerns that may dictate disposal method.

All decommissioning and restoration activities will be in accordance with all applicable state and local permits and requirements and will include the following specific activities:

- **Hardware retirement**: All power sources would be disconnected from structures and equipment before dismantling commences. Cranes and/or other machinery will be used for the disassembly and removal of structures and associated installations. These will either be transported whole for reconditioning and reuse or dissembled into salvageable, recyclable, or disposable components;

- **Foundation removal**: All foundation materials will be removed as per EPA guidelines or requirements. The remaining excavation will be filled with clean sub-grade material, compacted to a density similar to surrounding sub-grade material, and finished with topsoil;
- **Monitoring**: A monitoring and remediation period of two years immediately following the completion of any decommissioning and restoration activities will be undertaken. If agricultural impacts are identified during this period, follow-up restoration efforts will be implemented; and
- **Area restoration**: Areas where subsurface components are removed will be graded to match adjacent contours, stabilized with an appropriate seed mix, and allowed to re-vegetate naturally. All town roads, impacted by Project decommissioning activity, if any, will be restored to original condition upon completion of decommissioning.

8.2.2 Solid Waste Management

All solid waste resulting from the decommissioning process will be evacuated by handlers commissioned by the District Solid Waste Department.

8.3 Post-Decommissioning Assessment

Removal of machinery, equipment and all other materials related to the project will be completed within one year of decommissioning. At the end of the decommissioning exercise, the EPA will be invited to carry out a post-decommissioning assessment to establish compliance with all regulatory requirements and issue a certificate to that effect. The Decommissioning and Closure Plan will be finalized and submitted to the relevant authorities for approval at least six months prior to closure of the site.

A report describing the performance of the final DCP in working towards its objectives, based on monitoring results, and the extent to which it has been complied with, will be submitted to the EPA. The report will be provided to documented stakeholders and will otherwise be publicly available on request. Files and documents used to collate information regarding closure commitments, licenses, approvals and other information concerning closure will be catalogued and maintained in accordance with standard practices.

9.0 CAPACITY BUILDING AND TRAINING

9.1 Major Institutions

The main institutions to be involved with the implementation of the project and to ensure sound management of the environmental and social aspects include:

- Ministry of Food and Agriculture;
- Project Coordinating Unit;
- Water Resources Commission;
- Lands Commission;
- Environmental Protection Agency;
- Regional Coordinating Council;
- District Assembly;
- Fire Service; and
- NADMO.

9.2 Capacity Building Requirements

Project institutions need to understand the purpose of the ESMP, their expected roles and the extent to which the ESMP will facilitate the respective statutory functions. This will engender the required collaboration for the ESMP implementation.

Competence of government i.e., the ability of active government parties to carry out their respective design, planning, approval, permitting, monitoring, and implementation roles will, to a large extent, determine the success and sustainability or otherwise of the project.

The objectives and provisions of the ESMP therefore cannot be achieved in the absence of relevant competencies on environmental and social management within the Ministry of Food and Agriculture, and other stakeholders. The following sections provide recommendations on capacity building to support the program's environmental and social management objectives.

Identification of Capacity Building Needs

The first step in pursuing capacity building will be to identify the capacity building needs of the various stakeholders. Capacity building should be viewed as more than training. It is human resource development and includes the process of equipping individuals with the understanding, skills and access to information, knowledge and training that enables them to perform effectively. It also involves organizational development, the elaboration of relevant management structures, processes and procedures, not only within organizations but also the management of relationships between the different organizations and sectors (public, private and community).

The capacity building requirements will mostly be in the form of training workshops as follows:

(1) A training workshop on the E&S Safeguards should be organized for the major stakeholders identified above.

(2) A training workshop for the key project implementers including the Ministry of Food and Agriculture, PCU, and EPA should cover the following:

- Inclusion of environmental mitigation measures & penalties in contract documents of contractor and contractor supervision;
- Environmental screening and monitoring; and
- Public/community participation techniques and procedures.

For each group, training will be provided at different level of expertise in different areas, and would include:

- In-depth training to a level that allows trainees to go on to train others, including environmental and social procedures where relevant; and
- Sensitization or awareness-raising in which the participants are familiarized with the significance or relevance of the issues, to the extent that they can identify potential or emergent problems and request further assistance as necessary.

9.3 Public Engagement/Sensitization

In order to ensure proper implementation of the project, and to avoid public agitations/litigations which could affect the project execution, the Ministry of Food and Agriculture and District Assembly should engage/sensitize farmers and the public, particularly those whose property or livelihood may be affected. The engagement/sensitization should include the schedule of implementation, resettlement and compensation processes for any affected persons, grievance redress mechanism, traffic management, etc. The engagement/sensitization should be carried out ahead of construction works and any grievances addressed.

10.0 PUBLIC CONSULTATIONS AND DISCLOSURE

The ESIA preparation included preliminary stakeholder identification, some initial consultations and analysis of the requirements with key stakeholders. The key project stakeholders identified for consultations included government and non-governmental organizations. Stakeholder consultation is a process and should continue through the design stage of the project implementation phase.

10.1 Objectives of the consultations

The main objective of consultations with stakeholders is to discuss and provide relevant information on the project. Specifically, to achieve the following objectives:

- Provide some information about the proposed project;
- Provide opportunities for stakeholders to discuss their opinions and concerns;
- Provide and discuss with stakeholders, alternatives considered to reduce anticipated impacts;
- Identify and verify significance of environmental, social and health impacts; and
- Inform the process of developing appropriate mitigation and management guidelines.

10.2 Stakeholders Identified and consulted

The stakeholders identified and consulted are shown in **Table 10-1**.

Table 10- 1: Details of stakeholders identified and consulted

Group of stakeholders	Stakeholders	Date of consultation	Location of consultation	Total number of persons met	Total women met
Project Proponent/Beneficiary	Ministry of Food and Agriculture	23/11/2021	Bawku West	1	0
	Project Coordinating Unit	18/11/2021	Tamale	2	0
Regulatory Institution	Environmental Protection Agency	21/06/2022	Bolgatanga	1	0
Other Government Institutions	Ghana National Fire Service-Bawku West	08/12/2021	Bawku West	3	0
	Bawku West District Assembly				
	National Disaster Management Organization, Bawku West	23/11/2021	Bawku West	1	0
Other stakeholders	Commercial Farmer (Bawkuu West)	08/12/2021	Bawku West	1	0

	Commercial Farmer, Bawku West	12/12/2021	Bawku West	6	0
	Commercial Farmer, Bawku West	23/11/2021	Bawku West	2	0
	NGO, Bawku West	13/12/2021	Bawku West	1	0
	NGO, Bawku West	13/12/2021	Bawku West	1	1
	NGO, Bawku West		Bawku West	2	1
	Farmers	24/11/2021	Ankpaliga	1	0
		08/12/2021	Sitande	7	7
		07/12/2021	Gbere	4	4
		07/12/2021	Boya – Kpalsako	6	6
	Traditional Authority	09/12/2021	Lamboya	1	0
		09/12/2021	Biringu	4	0
		27/11/2021	Sakpe	2	0
	Women Group	07/12/2021	Boya – Kpalsako	6	6
		6/12/2021	Gbere	4	4
		08/12/2021	Sitande	7	7

10.3 Opinion of stakeholders about the project

All stakeholders interviewed were enthusiastic about the initiative and expressed a willingness to help it succeed. Most communities, on the other hand, were unaware of the initiative, and it was recommended that further outreach be done to educate the beneficiaries and nearby towns.

10.4 Concerns raised by stakeholders consulted and proposed solutions

A summary of the outcome of the initial consultations is provided below. These are mostly concerns and suggestions/interventions from institutions and individuals engaged. Details are captured in **Annex 5.**

Project implementation and Supervision

- Farmers should be allowed to partake/contribute rather than being fully reliant on the project.
- There should be a memorandum of understanding between farmers and the project to ensure a sense of responsibility by the farmers.
- The project implementing unit should be open about all issues concerning the project.
- Selection of beneficiaries should not be politically biased
- The project should be routed through agricultural departments because they are in charge of agricultural activities.

Community engagement and Sensitization

- Beneficiaries should be adequately informed and made aware that it is their property to increase the sense of ownership and prevent apathy on their part.

Women participation and equitable resource allocation

- More women should be selected to be part of the project.
- Women should be included in the project because they are the primary caregivers in the community and are most affected by security, food, and nutrition issues.
- Small ruminants that are easy to rear by women should also be provided as farm animals.

Socio-economic issues

- The project should target community members and provide resources that are proportionate to their needs.
- The initiative should have a beneficial influence on the recipients' lives.
- The community's level of life is generally considered to be moderate. The availability of land for agricultural and animal production improves the quality of life in the community. The community's quality of life will be improved through the provision of social facilities such as drinkable water, excellent roads, schools, and a clinic.
- Locals (mainly women) should be compensated for the destruction of economic trees such as dawadawa and shea, which provide a source of income for them.

Environmental issues and natural disasters

- Adequate education should be given to beneficiaries on possible hazards and ways of mitigating them.
- To avoid the devastating effects of climate change on the environment, any vegetation that may be destroyed should be replanted.
- To effectively protect available water bodies, farming around water bodies should be avoided.
- To cater for drought, a dugout should be provided to allow for all year-round farming.

Financial support

- The project should assist in providing financial support to beneficiaries.
- Most people especially women depend on Village Savings and Loans Associations (VSLA)

Transportation

- Adequate means of transportation should be made available to beneficiaries to facilitate the transportation of livestock and produce. Moreover, cost of transport should be subsidised to suppliers.

Provision of farm inputs and machinery

- Adequate and appropriate farming implements should be made available to farmers at subsidized prices.
- Most farmers do not own farm machinery. Tractors, for example, should be available not just to a few farmers, but to the majority as well.
- Vaccines should be made accessible to farmers.

Community leadership and governance

- Elders/Priests/leaders are chosen by the community and appointed by consent. People who are untrustworthy, have specified illnesses, or are under the age restriction are all barred from serving as elders or leaders.
- Among the important decision-makers are religious leaders, youth groups, and opinion leaders. The assembly member represents the government, and the community is pleased with their representation.

Land ownership, right and access

- Majority of lands are skin lands and can be accessed through a request from the traditional authorities (Tindaana). There are no squatters present who may be affected by any land acquisition.

Vulnerable groups

- There are some women-headed households who have no livelihood support
- There are vulnerable people who may be poor or have limited access to land. There are disabled persons in the community.
- Some households require support for survival especially during the non-farming season between April and June.

Community needs/priorities

- Electricity, health care, water and farming support are pressing needs of local communities.

10.5 Public disclosure

AfDB requires that environmental reports for projects are made available to project affected groups, local NGOs, and the public at large. Public disclosure of EIA documents or environmental reports is also a requirement of the Ghana EIA procedures **(Annex 1**). The report should be disclosed to all relevant stakeholders to make inputs or comments. Public notice in the media should be served for that purpose.

10.6 Grievance Redress Mechanism

The activities of the project may generate grievances arising from the interaction between project and local authorities/community, workers, and the host community etc. Some potential grievances identified and likely to occur during project implementation include:

- Complaints from workers at the site-level;
- Complaints from the local community on the conduct of workers, especially sexual harassment and other gender-based offenses;
- Complaints related to noise, dust, traffic incidents;
- Restriction of access to persons who otherwise were using portions of land e.g. for grazing
- Failure to consider the recruitment of local man-labour;
- Non-respect of the habits and customs of the host community by the actors of the site;
- Non-compliance with the measures or provisions contained in the ESMP

In managing grievances, a Grievance Redress Mechanism will be employed, and it will include:

- Setting up of a site-level GRM/GRMC for the adaptation and implementation by the contractor with regular reporting to the PIU.
- Setting up of a Grievance Redress Committee (GRC) at the community level (13 GRCs, 1 for each community) and the district level to receive and address grievances from stakeholders.
    - At the community level, the GRC will be made up of the Assemblyman, the Chief, a Youth Leader, and a representative of the project affected persons (PAPs). The Assemblyman will be responsible for receiving grievances and subsequently liaise with the other members of the GRC to have the issue resolved.
    - At the district level, the GRC will be made up of the District Planning Officer, District Lands Officer, A representative of the Agric Directorate, and District Social Welfare Officer.

- The PCU will constantly engage project affected persons through its Stakeholder and Public Disclosure Plan. This will keep the communities informed of developments on the project, including planned activities, project impacts and mitigation measures, grievance mechanism, the right to submit complaints and the compensation process.

- Building capacity of the Assemblymen to ensure they can engage the communities, record, and ensure grievances are resolved.

- Alternative Dispute Resolution Mechanisms will also be used as a key element of the GRM.

Grievances are expected to be communicated either verbally (in a language of choice) or in writing to the GRC. Upon receipt of complaints, timely responses are expected to be given. It is expected that if grievances cannot be resolved locally, then these will be referred quickly to the District Council GRC for resolution.

Actions to be taken to address the grievance will be agreed upon by the GRC, and progress of implementation of agreed measures reported to the Local community, Metropolitan Assembly, PCU and Ministry of Food and Agriculture on a weekly and monthly basis.

A grievance management procedure indicating activities and timeframe for resolution of issues is shown in **Figure 10-1**.

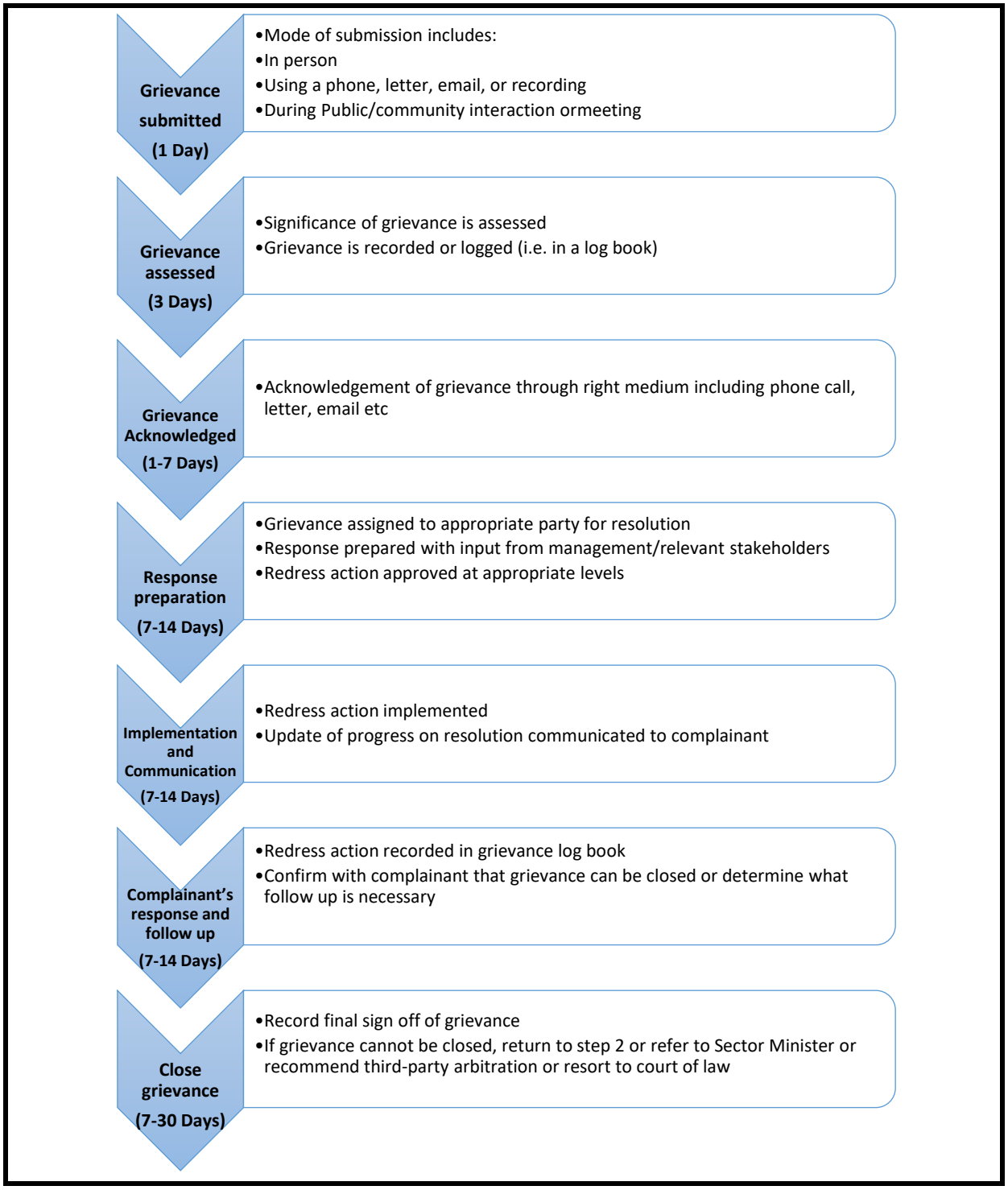


Figure 10- 1: Procedure for Grievance Redress

GRM operating budget

Table 10-2 presents the operating budget of the GRM. This budget is estimated at USD 79,000

Table 10- 2 : GRM Implementation Budget Summary

Headings	Unit	Quantity	Unit cost (USD)	Total cost (USD)
Reproduction and distribution of forms	Lump sum	1	5,000	5,000
Organization of GRM awareness and public campaigns in local communities	Session	20	2,000	40,000
Training of members of the two (02) committees on the GRM (community level and district level)	Session	2	2,000	4,000
Support for the operating of complaints management committees (communities and district)	Monthly	60	500	30,000
Total cost of the implementation of GRM				**79,000**

11.0 ESMP IMPLEMENTATION BUDGET

Budgetary estimates are provided in **Table 11-1** below to support the implementation of the environmental and social management plan. The estimated budget is **USD 1,081,000**.

Table 11- 1: Estimated budget to implement ESMP

No	Activity	Description	Responsibility	Total Cost, US$	Source of finance
A	**Institutional measures**				
1	Remuneration of the project's environmental safeguard specialist over 5 years	Implementation of ESMP	PIU	120,000	Project funds
2	Remuneration of the project's social safeguard specialist over 5 years	Implementation of ESMP	PIU	120,000	Project funds
3	Remuneration of the MDC environmental and social safeguard specialist over 10 months	Implementation of ESMP	PIU	20,000	Project funds
4	Remuneration of the environmental and social safeguard specialist of the works company over 12 months	Implementation of ESMP	PIU	24,000	Project funds
B	**Technical measures**			**256,000**	
	Specific technical measures				
5	Awareness creation on Project	Stakeholder engagement	PIU/ESS/SSS	5,000	Project funds
6	Capacity building for key stakeholders	Training workshop on National and AfDB requirements, EIA procedures, social measures and incorporating environmental and social measures etc. in contract documents.	PIU/Consultant	10,000	Project funds
7	Public engagement/ sensitization	Sensitization and engagement of project affected persons	PIU/Consultant	15,000	Project funds
8	Grievance Redress Mechanism (GRM)		PIU/ESS/SSS	79,000	Project funds
9	Decommissioning	Dismantling and removal of structures and equipment and waste disposal		15,000	Project funds
C	**Monitoring and Audits**				
10	Monitoring of environmental and social parameters of the works		PIU/ESS/SSS	267,000	Project funds
11	Annual E&S compliance Audits	To evaluate the compliance of the implementation of the project's E&S measures (ESMP)	PIU/ESS/SSS	150,000	Project funds
	TOTAL of the ESMP IMPLEMENTATION			**1,081,000**	

CONCLUSION

The proposed project is expected to be implemented in accordance with relevant national laws as well as best international practices.

Assessments have shown that the project generally has moderate impacts on the environment and impacts could be further mitigated with the adoption of good health, safety, and environment practices. Occupational, public health, safety and security issues and impacts will be properly managed to prevent any serious incident/accident or conflict. No resettlement is envisaged however, if any persons are displaced, impacts will be minimised through community sensitisation and extensive engagement with affected persons.

Identified adverse impacts will be mitigated with the implementation of the proposed mitigation measures and residual impacts contained and controlled by implementing the environmental management plan included in this report. Stakeholder concerns arising out of the public consultation and involvement process will be properly handled or addressed and further consultations will continue during the implementation stage.

The project will obviously benefit the local community through job creation, growth of businesses especially SMEs, increased knowledge, and adoption of best agricultural practices etc. Some benefits will accrue to government in the form of increased revenue from taxes, reduced unemployment rate, foreign direct investment, import substitution and a general improvement in the economy. Stakeholders are therefore urged to ensure that the outlined benefits accrue to the beneficiaries which includes the local community and government.

ANNEXES

Annex 1a: Administrative flow chart of environmental assessment procedure

Annex 1b: Evidence of project registration with EPA

Annex 2: List of environmentally sensitive areas

Annex 3: Sample Code of Conduct

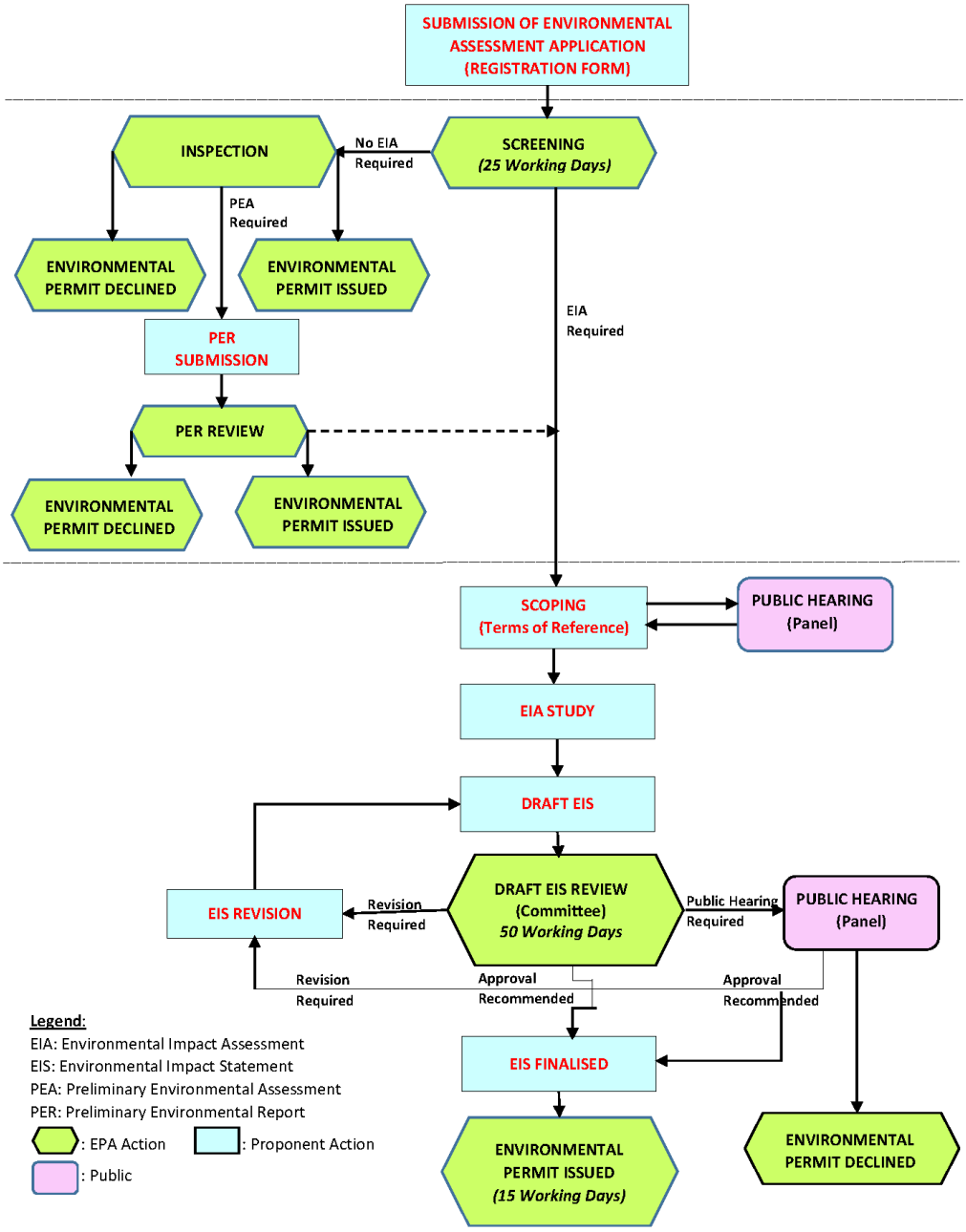
Annex 4: Sample Grievance Form

Annex 5: Details of Stakeholder Engagement

Annex 6: Air Quality, Noise Assessment and Surface Water Testing at Bawku West District

Annex 7: Pictures of Engagement

Annex 1a: Administrative flow chart of environmental assessment procedure



Annex 1b: Evidence of project registration with EPA

ENVIRONMENTAL PROTECTION AGENCY, GHANA

ENVIRONMENTAL ASSESSMENT REGISTRATION FORM

(To be completed in Duplicate)

Serial No. .....

FORM EA2

ASSESSMENT NO:		FILE NO:	

Environmental Protection Agency (Head Office)
P. O. Box M.326
Accra, Ghana

Tel: +233 0302 664697/8, 664223, 662465
Fax: +233 0302 662690

Environmental Impact Assessment
Registration Form

PROPOSED: **SAVANNAH AGRICULTURE VALUE CHAIN DEVELOPMENT PROJECT (SADP)**

Address for correspondence: Ministry of Food and Agriculture, Savannah Agriculture Value Chain Development Project (SADP)

Contact Person: Felix N. Darimaani **Position:** Project Coordinator

Phone No.: 0244582508 **Email.:** darimaanifelix@yahoo.com

1. Proposed Undertaking/Development:

The Savanah Agriculture Value Chain Development Project (SADP) is being implemented by the Government of Ghana through the Ministry of Food and Agriculture to serve as part of post COVID-19 reconstruction efforts aimed at addressing disruptions in food systems in Ghana. It builds on earlier successes under the Savannah Zone Agriculture Productivity Improvement Project (SAPIP) and Savannah Investment Programme (SIP) that have so far expanded the production of maize and soybean from 80 hectares in 2018 to 14,000 hectares in 2021. This program is expected to build on the achievements made and to further expand production of rice, soybean and maize by additional 8,000 hectares by 2026. The SADP project, is being implemented in nine (9) districts in the Savannah Zone of Ghana.

Sector : Agriculture

Shareholders : Ministry of Food and Agriculture, Ghana

2. Proposed Site : Nine (9) Districts in the Savannah Zone (Map attached)

District : Tamale Metro, Mion, Savelugu, East Mamprusi, West Gonja, Bawku West, Wa Municipal, Sissala East, and Nandom

Region : Northern, North East, Savannah, Upper East and Upper West

.....
Signature

20-June-2022
.....
Date

Annex 2 List of environmentally sensitive areas

ENVIRONMENTAL ASSESSMENT REGULATIONS, 1999

SCHEDULE 5

(Regulation 30 (2))

ENVIRONMENTALLY SENSITIVE AREAS

1. All areas declared by law as national parks, watershed reserves, wildlife reserves and sanctuaries including sacred groves.
2. Areas with potential tourist value.
3. Areas which constitute the habitat of any endangered or threatened species of indigenous wildlife (flora and fauna).
4. Areas of unique historic, archaeological or scientific interests.
5. Areas which are traditionally occupied by cultural communities.
6. Areas prone to natural disasters (geological hazards, floods, rainstorms, earthquakes, landslides, volcanic activity etc.)
7. Areas prone to bushfires.
8. Hilly areas with critical slopes.
9. Areas classified as prime agricultural lands.
10. Recharge areas of aquifers.
11. Water bodies characterized by one or any combination of the following conditions -
    a) water tapped for domestic purposes;
    b) water within the controlled and/or protected areas;
    c) water which support wildlife and fishery activities.
12. Mangrove areas characterised by one or any combination of the following conditions-
    a) areas with primary pristine and dense growth;
    b) areas adjoining mouth of major river system;
    c) areas near or adjacent to traditional fishing grounds;
    d) areas which act as natural buffers against shore erosion, strong winds or storm floods.

CLETUS AVOKA
Minister Responsible for the Environment

Date of *Gazette* notification: 26th February, 1999.

Entry into force: 24th June, 1999

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EIA IN GHANA

Annex 3: Sample Code of Conduct

All the employees of the Contractor and support staff of Supervising Consultant shall adhere to the following Code of Conduct during the execution of the project:

1. **Compliance with Applicable Laws, Rules and Regulations**
    a. All employees shall perform their duties in accordance with the Labour Act, 2003 and other applicable labour laws in Ghana.
    b. Employees/key experts will enjoy freedom of association and expression as defined in the Constitution of Ghana and expressed in Labour Act, 2003 (Act 651) and other labour laws in Ghana.
    c. The Organization will not condone the activities of employees who achieve results through violation of the law or unethical business dealings. This includes any payments for illegal acts, indirect contributions, rebates, and bribery.
    d. The Organization shall not permit any activity that fails to stand the closest possible public scrutiny.
    e. Employees uncertain about the application or interpretation of any legal requirements should refer the matter to appropriate line supervisor
    f. Workers/employees who falsify their ages will be summarily dismissed as the company does not tolerate child and forced labour.
    g. The company will not tolerate any form of child or forced labour from any sub-contractor/employee who practice forced or child labour
    h. Employees are required to report suspected cases of child or forced labour on site to GASSLIP Environmental and Social Specialist, DOVVSU or District Assembly .

2. **Compliance with Applicable Health and Safety Requirements**
    a. All employees' have the right and duty to ensure safe working conditions to the extent of exercising control over tools, equipment, machinery and processes and to express their views on working conditions that may affect their safety and health. Sub-contractors will do same for their employees
    b. Employees of the Contractor shall be responsible for removing themselves from danger as much as possible whenever they have good reason to believe that there is an imminent and serious danger to their safety or health. They should have the duty so to inform their supervisor immediately.
    c. Employees/key experts will be provided with the appropriate protective gear for the operations or activities and request for same before engaging in any activity associated with the works.
    d. No worker shall be allowed to undertake any work without wearing approved protective clothing/gear.
    e. Workers shall use and take care of personal protective equipment, protective clothing and facilities placed at their disposal and not misuse anything provided for their own protection or the protection of others
    f. First time offenders who are not in the appropriate protective gear will receive a verbal caution, second time offenders will receive a formal written caution, while multiple offenders will receive sanctions ranging from suspensions to dismissal.
    g. Except in an emergency, employees, unless duly authorised, should not interfere with, remove, alter or displace any safety device or other appliance furnished for their

protection or the protection of others, or interfere with any method or process adopted with a view to avoiding accidents and injury to health.

h. Every employee shall take reasonable care for their own safety and health and that of other persons who may be affected by their acts or omissions at work;
i. Workers shall report to their immediate supervisor, and Health and Safety Officer, any situation which they believe presents a risk and which they cannot properly deal with themselves;
j. Damaged or faulty electrical equipment such as power sockets, leads and appliances are removed from service.
k. Damaged or faulty equipment should be replaced, or repaired by a qualified person as soon as possible.
l. Power points should be protected by safety-shutters, or all vacant power points be covered by plastic plug protectors.
m. Electrical appliances and leads should be kept away from water.
n. All machines and vehicles should be turned off when not in use
o. All employees shall comply with all the safety and health measures prescribed by the employer. Employees should not operate or interfere with plant and equipment that they have not been duly authorised to operate, maintain or use.
p. Employees should not sleep or rest in dangerous places such as scaffolds, railway tracks, garages, or in the vicinity of fires, dangerous or toxic substances, running machines or vehicles and heavy equipment.
q. Supervisors should not assign employees to undertake activities that the later do not have necessary competence, training or certification or that has not been stated in their contract with the Company.
r. Employees should not undertake any assigned activity for which you do not have necessary competence, training or certification or that has not been stated in their contract with the Company.
s. Every employee is encouraged to contribute by integrating environmental sustainability issues as they relate to our industry into our business planning, strategies and decision-making.
t. Employees shall avail themselves for all OHS, HIV/AIDS Gender Based Violence, Emergency Preparedness Training/Sensitization Programmes organized under the project.
u. All Company employees should strive to conserve resources and reduce waste through re-use and other energy conservation measures.

3. Use of Illegal Substances

a. No employee/key expert/sub-contractor shall report to work under the influence of alcohol or any substance considered as illegal under the laws of Ghana including marijuana.
b. No employee shall smoke, consume alcohol or illegal substances while on duty, including lunches and during overtime meals, or on company property.
a. Officers and directors *may* authorize, in advance, the consumption of alcohol for special occasions or for certain business meetings as long as such use is limited and does not violate other legal requirements.
b. No employee shall under any circumstance engage in any work related to the organization under the influence of Alcohol or illegal substances even if consumption is permitted under the exception described above.
c. Employees who violate this smoking and alcohol conduct standard may have their contract terminated.

4. Non- Discrimination

a. Discrimination against any job applicant or employee on the grounds of colour, race, religion, age, nationality, sex, marital or family status, ethnic affiliation, pregnancy, sexual orientation, disability or other reason is prohibited.
b. In certain cases, however, the requirements of safety regulations relating to specific positions/activities within a construction business will take precedence over clause 4(a).
c. We do not employ any person below the legal minimum age (18 years) and will require commitments from suppliers and subcontractors to refrain from such practices
d. Workers are not to undertake any assigned activity for which they do not have necessary competence, training or certification or that has not been stated in their contract with the Company.
e. Recruitment, job transfer and progression, remuneration and training and award of discretionary bonuses when applicable are determined solely by the application of objective criteria, fair and unprejudiced opinion, personal performance and merit.
d. Recruitments, transfers, training, maternity leave and standard terms and conditions will be done in accordance within line Ghana Labour laws.
e. Employees who perceive that they have been discriminated against can seek redress through their supervisor, Environmental, Health and Safety Officer, management and/or the Ministry of Labour and Social Welfare

5. Interaction with Community

a. The Company strives to cultivate a local identity in each of its host communities by setting good corporate citizenship standards, while respecting local sensitivities.
b. The Company will regularly contribute to the economic and social development of communities, and expects all employees to promote human rights and respectful community involvement anywhere it operates.
c. Employees should comply with the norms, laws, rules and regulations applicable to the host communities except in cases where they are in conflict with that of Ghanaan laws.
d. In a case where an employee perceives that the laws, rules and regulations of host communities are in conflict with that of the company, employees are to refer such cases to their supervisor, Environment, Health and Safety Officer or manager for further clarification at the Ministry of Labour and Social Security

6. Sexual Harassment

Sexual Harassment would be considered as unwelcome conduct of a sexual nature which makes a person feel offended, humiliated and/or intimidated. It includes situations where a person is asked to engage in sexual activity as a condition of that person's employment, as well as situations which create an environment which is hostile, intimidating or humiliating for the survivor

a. Sexual harassment is unlawful.
b. This company does not tolerate sexual harassment in any form.
c. Every employee has a responsibility to ensure that sexual harassment does not occur.
d. No employee shall under any circumstance sexually engage another either by the use of words or actions. Some acts that may be considered as sexual include;
    - *an unwelcome sexual advance*
    - *a request for sexual favours*

- *unwelcome comments about someone's sex life or physical appearance*
- *sexually offensive comments, stories or jokes*
- *displaying sexually offensive photos, pinups or calendars, reading matter or objects*
- *sexual propositions or continued requests for dates*
- *physical contact such as touching or fondling, or unnecessary brushing up against someone*
- *Indecent assault, defilement or rape (these are criminal offences).*

e. Any employee who believes he or she has been a target/survivor of sexual harassment is encouraged to inform the offending person orally or in writing that such conduct is unwelcome and offensive and must stop or to report the unwelcome conduct as soon as possible to a supervisor, management or the environmental and social officer of GASSLP representative on the Project Grievance Redress Committee or the nearest DOVVSU or Police Station
f. Reports of sexual harassment will be treated promptly, seriously and confidentially.
g. Complainants have the right to determine how a complaint will be treated and knowledge of the outcome of investigations.
h. Anyone found to have sexually harassed another person will be handed over to the Family Support Unit of the Ghana Police Force.
i. No employee will be treated unfairly as a result of making a complaint of sexual harassment. Immediate disciplinary action will be taken against anyone who victimizes or retaliates against someone who has made a complaint of sexual harassment.
j. For the purposes of reporting and dealing with sexual harassment and crimes, the Company will provide a hot line to a management level personnel for reporting cases of sexual abuse and harassment.
k. Rape, defilement and assault cases shall be reported to FSU of the Ghana Police Force by survivor or other employees'

7. Violence or Exploitation

a. No employee shall bear any weapon on site unless he/she has been authorized and have a legitimate business reason to do so. Even so, this will have to be with the permission of the appropriate supervisor, manager and conformity with the laws of Ghana.
b. The company is committed to maintaining a safe and secure workplace and working environment. Acts or threats of physical violence, intimidation, harassment or coercion, stalking, sabotage, and similar activities are not tolerated.
c. Employees who engage in acts or threats of violence, outside of self-defense, shall be dismissed and handed over to the Police Station.
d. Employees are expected to treat all individuals with respect, tolerance, dignity and without prejudice to create a mutually respectful and positive working environment.

8. Protection of Children

a. As much as possible, employees' are to avoid bringing any person under 18 to work on the project site) unless with permission from Environment, Health and Safety Officer.
b. Every employee shall himself be responsible for the safety and wellbeing of any person under age 18 years brought to work by them. *Physical contact with children can be misconstrued both by the recipient and by those who observe it, and should occur only when completely nonsexual and* otherwise appropriate, and never in private.

c. One-on-one meetings with a child or young person are best held in a public area; in a room where the interaction can be (or is being) observed; or in a room with the door left open, and another employee or supervisor is notified about the meeting.
d. Avoid any covert or overt sexual behaviors with children on site. This includes seductive speech or gestures as well as physical contact that exploits, abuses, or harasses.

e. Employees are to provide safe environments for children and youth at all times on site

9. Sanitation Requirement

a. The company shall provide and maintain sanitary facilities (according to building regulations) for all employees to ensure their total health and safety. All such facilities shall be labelled with inscription in English for the understanding of every employee.
b. Every employee/key expert shall be responsible for the appropriate use of sanitary facilities including toilets, bathrooms and refuse bins/skip containers where provided.
c. No employee shall resort to other inappropriate means of defecation or urination (open defecation or indiscriminate disposal of refuse or urination on the company's compound or project site) apart from what has been prescribed by the company.
d. Any act of indecency with respect to the use of sanitary facilities shall attract punitive actions including suspensions or even dismissals.

10. Avoidance of Conflict of Interest

a. The Company expects that employees will perform their duties conscientiously, honestly, and in accordance with the best interests of the Organization.
b. Employees/key experts must not use their positions or the knowledge gained as a result of their positions for private or personal advantage.
c. Regardless of the circumstances, if employees sense that a course of action they have been pursued, or are presently pursuing, or are contemplating pursuing may make it difficult to perform the work objectively, they should immediately communicate all the facts to their supervisor.
d. An Employee or a member of his or her immediate family shall not receive improper personal benefits as a result of his or her position in the Company.
e. Any situation that involves, or may reasonably be expected to involve, a conflict of interest with the Company should be disclosed promptly to supervisors/ managers.

11. Protection and Proper Use of Property

a. All employees unless otherwise directed are responsible for the proper acquisition, use, maintenance and disposal of company assets (e.g., materials, equipment, tools, real property, information, data, intellectual property and funds) and services. Acquisition of assets should be in compliance with procurement standards of the company.
b. Any act of theft, carelessness, and waste on the part of an employee shall attract sanctions including the termination of one's work contract.
c. Every employee shall do their part to protect the company's assets and ensure their efficient use.
d. Unless otherwise permitted by management, Company guidelines and procedures, the appropriation of Company property by employees for personal use, or for resale is strictly prohibited.
e. Similarly, you are not permitted to use your authority over other employees to use Company resources for personal benefit.

f. On termination of and at any other time during your employment when requested you must hand over Company's assets and records stored in whatever format or medium.
g. The Company strictly prohibits any access, usage or disclosure of employees' personal data without legitimate authorization. Employees should note that the Company reserves the right to retrieve their e-mails transmitted via the Company e-mail accounts and to monitor your use of the Internet.
h. Every employee shall use company assets only for legal and ethical activities.

12. Report of Violation of Code of Conduct

a. Employees should promote ethical behavior and encourage other employees to talk to supervisors, managers or other appropriate personnel when in doubt about the best course of action in a particular situation.
b. In order to protect our organization from unethical or illegal activity, it is your duty and obligation at all times to be watchful of the practices that you see occurring around you, to take reasonable steps to prevent or detect improper conduct, and to report any suspicion of fraudulent, abusive, unethical or illegal activity.
c. All reports of misconduct or unethical behavior, conflict of interest, or illegal activity are to be handled as confidential and be treated seriously and discreetly.
d. Employees may report anonymously should that be their preference.
e. In the event of a grievance being raised to a manager relating to discriminatory behaviour or harassment, the manager must notify Human Resources immediately, irrespective of how trivial the complaint may appear.

13. Non-Retaliation

a. The company will not tolerate any act of retaliation against anyone who, in good faith, reports known or suspected unethical or illegal misconduct, seeks advice, raises a concern, or provides information in an internal or external investigation or legal proceeding pertaining to the company.
b. Allegations of retaliation will be investigated, as appropriate.
c. Acts of retaliation (which may include firing or laying off, demoting, denying overtime or promotion, disciplining, denying benefits, failing to hire or rehire, intimidation or making threats) may lead to disciplinary action against the person responsible for the retaliation, up to and including termination of contract.
d. Any employee who believes he/she has experienced retaliation, should report to his/her supervisor, manager or the Environmental and Social Officer GASSLIP.
e. Any false accusation of retaliation would attract disciplinary actions even to the extent of termination of contract.

Implementation of Code of Conduct

a. The Environment, Health and Safety Officer of the Contractor will be responsible for implementing and enforcing the Code of Conduct, while monitoring
b. The following measures will be adopted to implement the Code of Conduct:
    - The Consultant will ensure that all employees/key experts and sub-contractors are given copies of the Code of Conduct for reference.
    - All employees on the assignment will be made to sign the Code of Conduct.

Annex 4: Sample Grievance Form

GRIEVANCE REGISTRATION FORM (FORM A) – For Complainant

Confidentiality Required: Yes ☐ No: ☐

Name (Complainant) Optional:.....

Contact Information (house number/ mobile phone):.....

Nature of Grievance or Complaint:.....

Details of Grievance:.....

.....

.....

.....

.....

.....

.....

Name (Receiver):..... Signature:..... Date:.....

Name (Filer):..... Signature:..... Date:.....

Relationship of Filer to Complainant (if different from Complainant):

.....

.....

Annex 5: Details of Stakeholder Engagement

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
Government Institutions – Category A					
District MOFA, Bawku West.	Elias Atinbire	Director	0244985824	23/11/2021	• **Awareness Creation –** the beneficiary community should be well sensitized about the project • **Farmer Commitment –** Farmers should be allowed to partake/contribute rather than being fully reliant on the project. • **MOU –** There should be a memorandum of understanding between farmers and the project to ensure a sense of responsibility by the farmers. • **Monitoring –** There should be regular monitoring by the project team • **Transparency –** The project implementing unit should be open about all issues concerning the project.
NADMO, Bawku West.	Anania Daniel Atampuba	NADMO Director	0540217644	23/11/2021	• **Regular Monitoring –** Regular monitoring should be conducted to ascertain the progress of the project. • **Community engagement and sensitization -** The beneficiaries should be adequately informed and made aware that it is their property in order to prevent apathy on their part. • **Inadequate funds –** Adequate funds should be provided for the smooth running of the project. • **Disaster Management –** Adequate measures should be put in place to avoid disasters on project.
Ghana National Fire Service- Bawku West	Wesoeamo Wemah Akolbilla Zakari Abase Vuabagwi M.	District Commander Fire officer Fire officer	0206650330 0242801847 0249033484	08/12/2021	• **Political Interference-** There should be no political interference in the selection of beneficiaries • **Monitoring and Sensitization –** Regular visits should be conducted by project team/ fire officers to educate farmers on the risk of fire and fire prevention. • **Target group-** More women should be selected to be part of the project. • **Bush fires –** To prevent bushfires on farms, additional educational and preventative measures should be implemented. • **Fire volunteers –** individuals of the community must be selected and trained as fire volunteers, to assist in the case of fire outbreaks.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
EPA – Upper East Regional Office, Bolgatanga	Solomon Baogzuoya	Director	0246056297	21/06/2022	• **Acquiring Environmental Permits** – The EPA requests that's the beneficiary farmers from the project should acquire environmental permits before starting of farming activities. The project can also negotiate with the EPA to subsidise the charges on farmers to acquire environmental permits before production. • **Sensitization of farmers on chemical use** – chemicals e.g. pesticides from Burkina Faso and Togo with French inscriptions could be misapplied by farmers hence the need for sensitization. Joint sensitization efforts are required for the farmers and the chemical retailers to ensure compliance.
Private Institutions – Category B					
Commercial Farmer, Bawku West	Azaibo Thomas	Farm Manager	0249704498	08/12/2021	• **Monitoring and Sensitization –** Farmers should be well informed about the project and should be closely monitored by project officers. • **Political Interference –** Selection of beneficiaries should not be politically biased • **Gender inequality –** Women as well as men should benefit equally from the project. • **MOU –** To ensure that farmers are held accountable, a memorandum of understanding should be signed between farmers and the project.
NGO, Bawku West	Rebecca Lariba Seidu	Project Manager ADDRO	0244066589	13/12/2021	• **Political Interference –** To ensure that deserving communities are chosen, the selection of beneficiaries should be free of political interference. • **Equitable allocation of resources –** Resources should be distributed evenly among all implementing districts to ensure that issues of accountability and transparency are addressed appropriately. • **Gender concerns –** Women should be included in the project because they are the primary caregivers in the community and are most affected by security, food, and nutrition issues. • **Monitoring –** Effective and efficient monitoring mechanisms should be put in place to ensure that the project is on track and that the set indicators are met in order for the project to have an impact. • **Stakeholder identification –** From the outset, the project should identify the appropriate stakeholders to assist with implementation. • **Disaster mitigation** - Communities' capacity for disaster mitigation and resilience should be built in order to make them aware of and prepared for any disaster.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
Commercial Farmer, Bawku West	Akande Awintumah	Commercial Farmer	0242026967	12/12/2021	• **Machinery Acquisition –** The majority of farmers do not own farm machinery. Tractors, for example, should be available not just to a few farmers, but to the majority as well. • **Training and Monitoring –** There should be continuous training and ongoing monitoring for farmers on the project • **High Interest on Loans and inputs –** Government is entreated to subsidize loans for agricultural purposes • **Political Interference –** The beneficiaries of the project should be selected without any political interference. • **Motivation –** Farmers should be recognized or compensated for their efforts. • **Fuel for tractors –** Governments should subsidize fuel for tractors for farming
NGO, Bawku West	Magdalene Ayamga Justice Tiigah	Int. Development Facilitator Life Project Officer	0245191901 0243414688		• **Monitoring –** Efficient and effective monitoring should be done on a regular basis to help track progress of the project. • **Stakeholders –** Relevant stakeholders should be identified at the start of the project to ensure that the necessary support is provided to ensure the project's success. • **Gender Issues –** Equal opportunities should be provided for both men and women to be partakers of the project as they both play significant roles in providing food for the family at large. • **Resources -** According to their needs, resources should be distributed to all districts implementing the project. • **Disaster Awareness –** Adequate education should be given to beneficiaries on possible hazards and ways of mitigating them.
Commercial Farmer, Bawku West	Alhaji Mahamadu Mbilla Asiaki Abdul Fatawu Mahamadu	Commercial Farmer Farm Manager (ASAKI FARMS)	0244487439 0544026824	23/11/2021	• **Proper project channeling –** The project should be routed through agricultural departments because they are in charge of agricultural activities. • **Political influence –** Project should be devoid of all political interference. • **Procurement of inputs for farmers –** Adequate and appropriate farming implements should be made available to farmers at subsidized prices. • **Target communities –** The project should target community members and provide resources that are proportionate to their needs.
NGO, Bawku West	Akugri John	Community Extension Project Officer- CARE	0246322898	13/12/2021	• **Selection of Animal –** Small ruminants that are easy to rear by women should also be provided as farm animals. • **Nutrition –** The project should promote the general nutrition of community members

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Beneficiaries –** Women and girls should be among the project's beneficiaries. • **Stakeholders –** The appropriate stakeholders should be identified to assist in the project implementation • **Vaccination –** Vaccines should be made accessible to farmers.
Community and Focus Group – Category C					
Ankpaliga, Bawku West	Ayishetu Mahamadu	Farmer		24/11/2021	• **Community awareness of project –** The community is not aware of the project • **Land acquisition and involuntary resettlement –** Community not aware there may be land acquisition and resettlement as a result of the project. • **Project impact on Community –** Because the project is agriculturally related, the community believes it will benefit them. They are concerned, however, about whether the project will benefit all farmers. • **Land Ownership –** The community is unaware of how much land is owned by the stool, private individuals, or the government. • **Land use –** The land is mainly used for farming. • **Land right and access -** The land can be accessed through a lease, individual land ownership, or rent. However, there are people who do not have access to or the right to use land, and they can only farm because land is leased or rented to them. There are squatters present who may be impacted by land acquisition. • **Land-related conflict –** Community has not experienced any land-related conflicts. • **Livelihood activities –** The main livelihood activities are farming, and trading. • **Livelihood challenges –** The community has challenges with access to land, capital acquisition, and climate change. • **Community population –** The community has a population of about 1000. • **Ethnic groups –** The Kusasi's, Bisa's, and Grusi's/Frafra's are the major ethnic groups in the community. • **Migrant population –** There are no migrants in the community. • **Vulnerable groups –** There are vulnerable people who may be poor or have limited access to land. • **Religion –** The community's major religions are Christianity, Islam, and Traditional. • **Women-headed households –** There are more than 70 women headed households in the community. • **Indigenous people –** There are indigenous people in the community

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Support for the less privileged –** There are programs like LEAP that aid the less privileged in the community. Farming seasons were reported to be the most difficult in terms of having money as food and farm inputs are required simultaneously. • **Key decision-makers –** Assembly members, Chiefs, the Queen mother, and the Unit committee members are among the key decision-makers. The assembly member and the MP serve as government representatives, but the community is dissatisfied with them. • **Women in leadership –** Women are not involved in decision making. • **Local groups –** Community watch dogs, and youth groups in the community see to the welfare and security of the community. • **Appointment of community leadership–** The community appoints its elders on the basis of character records. • **Existing traditional/Cultural groups –** The Drumming and the singing groups are the main cultural groups present, and these are for entertainment purposes. • **Festivals and sacred events/sites–** The Samanpiid festival which is celebrated after harvest and the Zekula festival also celebrated after harvest, constitute the main festivals in the community. Sacred sites like shrines, may be impacted by the project. • **Health care –** There are no health facilities in the community. The nearest clinic and a hospital are located in Zebilla. • **Educational facilities –** There are no educational facilities in the community, with the nearest facilities being about a kilometre away. • **Water and sanitation –** There is water supply in the community. • **Utility services –** Charcoal and fuelwood are the main sources of energy. The community has access to about 3 mobile phone networks. • **Quality of life –** Low quality of life due to inadequate food supply throughout the year. A closeness of the community to the district market is the positive thing to the community. • **Community needs/priorities –** The 3 topmost priorities of the community are farming, healthcare, and education.
Lamboya, Bawku West	Hon. Azaaba Williams			09/12/21	• **Community awareness of project –** The community is not aware of the project

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Land acquisition and involuntary resettlement –** Community not aware there may be land acquisition and resettlement as a result of the project. • **Project impact on Community –** The community believes the project will benefit them only if there is enough awareness and sensitization about the project. • **Land Ownership –** The community is unaware of how much land is owned by the stool, private individuals, or the government. • **Land use –** The land is mainly used for farming and settlement. • **Land right and access** - The land can be accessed through a lease, individual land ownership, or rent. However, there are people who do not have access to or the right to use land, and they can only farm because land is leased or rented to them. There are no squatters present who may be impacted by land acquisition. • **Land-related conflict –** Community has not experienced any land-related conflicts. • **Livelihood activities –** The main livelihood activities are farming, and petty trading. • **Livelihood challenges –** The community has challenges with access to productive land, and capital acquisition for petty trading. • **Community population –** • **Ethnic groups –** The Kusasi's, Bisa's, and Moshies are the major ethnic groups in the community. • **Migrant population –** There are no migrants in the community. • **Vulnerable groups –** There are vulnerable people who may be poor or have limited access to land. There are also disabled community members. • **Religion –** The community's major religions are Christianity (30%), Islam (10%), and Traditional (60%). • **Women-headed households –** There are about 80 women headed households in the community. • **Indigenous people –** There are indigenous people in the community • **Support for the less privileged –** There is no support for the less privileged. Planting seasons were reported to be the most difficult since money is needed to buy inputs for farming. • **Key decision-makers –** Assembly members, Chiefs, the Queen mother, and the Unit committee members are among the key decision-makers. The assembly member

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					serves as government representative, but the community is dissatisfied with the representation. • **Women in leadership -** It is through the queen mother that women are involved in decision making. • **Local groups –** Farmer based organizations, and youth groups in the community see to the welfare and security of the community. • **Appointment of community leadership –** The community appoints its elders through collective appointment and through appointment by the local chief. However, people with certain disabilities cannot be leaders like a chief. • **Exiting traditional/Cultural groups –** The Drumming and the singing groups are the main cultural groups present, and these are for entertainment purposes. • **Festivals and sacred events/sites –** The Samanpiid festival which is celebrated after harvest constitutes the main festival in the community. No sacred sites like shrines, will be impacted by the project. • **Health care –** There is a community post natal center. The nearest clinic and a hospital are located in Zebilla town. • **Educational facilities –** The community has a primary and a Junior High School, but has no Senior High School. The nearest Senior High School is located in Zebilla town. • **Water supply and sanitation–** The community is supplied with water through pumps and a dugout. • **Utility services –** Charcoal, electricity and fuelwood are the main sources of energy. The community also has access to about 3 mobile phone networks. • **Quality of life –** Quality of life is generally okay as it is close to the capital town. A closeness of the community to the town is a positive thing to the community. • **Priorities of community –** The 3 topmost priorities of the community are farming, healthcare, and water.
Biringu, Bawku West	Apam Abugri Azumah Apam Ayamba Rahmond	Headman (Chief's rep.) - SMC Chairman	- 0236323105 0548057678	09/12/2021	• **Community awareness of project –** The community is not aware of the project • **Land acquisition and involuntary resettlement –** Community not aware there may be land acquisition and resettlement as a result of the project. • **Project impact on Community –** The community believes the project will be good for farmers. The community would like to know the payment of recovery.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
	Tilaji David	SMC Secretary	0540631156		• **Land Ownership –** The community is unaware of how much land is owned by the stool, private individuals, or the government. • **Land use –** The land is mainly used for farming including animal rearing. • **Land right and access -** The land can be accessed through a lease, individual land ownership, or rent. However, there are people who do not have access to or the right to use land, and they can only farm because land is leased or rented to them. There are no squatters present who may be impacted by land acquisition. • **Land-related conflict –** Community has not experienced any land-related conflicts. • **Livelihood activities –** The main livelihood activities are farming, and petty trading. • **Livelihood challenges –** The community has challenges with access to machinery for farming, capital acquisition, and seeds availability • **Community population –** There are about 1,141 people in the community. • **Ethnic groups –** The Kusaasi's, Bisa's, Fulani's, Dagomba's and Mousi's are the major ethnic groups in the community. • **Migrant population –** There are no migrants in the community. • **Vulnerable groups –** There are vulnerable people who may be poor or have limited access to land. There are also disabled community members (about 11). • **Religion –** The community's major religions are Christianity (30%), Islam (10%), and Traditional (60%). • **Women-headed households –** There are about 22 women headed households in the community. • **Indigenous people –** There are indigenous people in the community • **Support for the less privileged –** There is no support for the less privileged. • **Key decision-makers –** Assembly members, Chiefs, and the Unit committee members are among the key decision-makers. The assembly member serves as government representative, and the community is satisfied with their representation in government decisions. • **Women in leadership -** Women are involved in decision making. • **Local groups –** 'Susu' groups which contribute money for farming purposes. • **Appointment of community leadership –** The community appoints its elders through inheritance. However, people with certain disabilities cannot be leaders like a chief. • **Exiting traditional/Cultural groups –** There are no traditional/cultural groups.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Festivals and sacred events/sites –** The Samanpiid festival which is celebrated after harvest constitutes the main festival in the community. No sacred sites like shrines, will be impacted by the project. • **Health care –** There is a CHPS compound in the community. The nearest clinic and a hospital are located in Zebilla town. • **Educational facilities –** The community has a primary and a Junior High School, but has no Senior High School. The nearest Senior High School is located in Zebilla town. • **Water supply and sanitation–** The community is supplied with water by borehole. • **Utility services –** Charcoal, fuelwood are the main sources of energy. The community also has access to about 3 mobile phone networks. • **Quality of life –** Quality of life is generally good since there is peace and unity among the people. A closeness of the community to the town is a positive thing to the community. The provision of electricity and a dugout for irrigation during the dry season would make the community a better one. • **Priorities of community –** The 3 topmost priorities of the community are water, electricity, and farming.
Boya – Kpalsako, Bawku West	Awinpang Cynthia Avalimkuba Awini Aluugu Mba Apasmam Agbango Awanamas Ndeogbilla Agatimtoi Adeba	Chair Treasurer Member Member Secretary Member		07/12/2021	• **Community awareness of project –** The community is not aware of the project • **Land acquisition and involuntary resettlement –** Community not aware there may be land acquisition and resettlement as a result of the project. • **Project impact on Community –** The community believes the project will be good because it involves farming and animal rearing. The community would like to know the type of support to be given to farmers and whether there will be a payment of recovery. • **Land Ownership –** The community is unaware of how much land is owned by the stool, private individuals, or the government. • **Land use –** The land is primarily used for farming and animal husbandry. • **Land right and access** - The land can be accessed through a lease, individual land ownership, or rent. However, there are people who do not have access to or the right to use land, and they can only farm because land is leased or rented to them. There are no squatters present who may be impacted by land acquisition. • **Land-related conflict –** Community has not experienced any land-related conflicts.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Livelihood activities –** The main livelihood activities are farming, livestock farming and petty trading. • **Livelihood challenges –** The community has challenges with access to water for farming in the dry season, capital acquisition, droughts, and access to farm inputs. • **Community population –** There are about 1,520 people in the community. • **Ethnic groups –** The Kusaasi's, and Frafra's are the major ethnic groups in the community. • **Migrant population –** There are no migrants in the community. • **Vulnerable groups –** There are vulnerable people who may be poor or have limited access to land. There are also disabled community members. • **Religion –** The community's major religions are Christianity (30%), Islam (10%), and Traditional (60%). • **Women-headed households –** There are about 150 women headed households in the community. • **Indigenous people –** There are indigenous people in the community • **Support for the less privileged –** There is support for the less privileged under the LEAP program. The period in the year where local people face economic/financial difficulties is between May and September every year. • **Key decision-makers –** Assembly members, Chiefs, and the Women leaders are among the key decision-makers. The assembly member serves as government representative, and the community is satisfied with their representation in government decisions. • **Women in leadership -** Women are involved in decision making an example is through the Asungtaaba women group as well as through the queen mother. • **Local groups –** 'Susu' groups which contribute money for trading. • **Appointment of community leadership –** The community appoints its elders through inheritance and community appointment. However, people with character flaws cannot be chosen to be leaders. • **Exiting traditional/Cultural groups –** There is the local dancers' group referred to as "Boya Tokwadib". • **Festivals and sacred events/sites –** The Samanpiid festival which is celebrated after harvest constitutes the main festival in the community. No sacred sites like shrines, will be impacted by the project.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Health care –** In the community, there is a CHPS compound. The nearest clinic is in Binaba, and the nearest hospital is in Zebilla. • **Educational facilities –** There is a primary school in the community, but no junior high or senior high school. The closest Senior High School is in Zebilla town, and the closest Junior High School is in Boya Natinga. • **Water supply and sanitation–** The community is supplied with water by borehole. • **Utility services –** Charcoal, fuelwood and gas are the main sources of energy. The community also has access to about 3 mobile phone networks. • **Quality of life –** Quality of life is described as moderate since there is peace and unity among the people. A closeness of the community to the town is a positive thing to the community. The provision of electricity, a dugout for irrigation during the dry season and a Junior High School would make the community a better one. • **Priorities of community –** The community's top three priorities are electricity, farming, and water.
Gbere, Bawku West	Atampuri Mbasaki Atuldago Gifty Agobire Chardson Akomisa Akulsum			07/12/2021	• **Community awareness of project –** The community is not aware of the project • **Land acquisition and involuntary resettlement –** Community not aware there may be land acquisition and resettlement as a result of the project. • **Project impact on Community –** The community believes the project will be good because it involves farming and animal rearing. The community would like to know the target group of the project and how the payment of recovery will be. • **Land Ownership –** The community is unaware of how much land is owned by the stool, private individuals, or the government. • **Land use –** The land is primarily used for farming and animal husbandry. • **Land right and access -** The land can be accessed through a lease, individual land ownership, or rent. However, there are people who do not have access to or the right to use land, and they can only farm because land is leased or rented to them. There are no squatters present who may be impacted by land acquisition. • **Land-related conflict –** Community has not experienced any land-related conflicts. • **Livelihood activities –** The main livelihood activities are farming, livestock farming and petty trading.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Livelihood challenges –** The community faces challenges such as access to water for farming during the dry season, capital acquisition, animal disease, and a scarcity of bullocks for ploughing. • **Community population –** There are about 955 people in the community. • **Ethnic groups –** The Kusaasi's, and Fulani's are the major ethnic groups in the community. • **Migrant population –** There are no migrants in the community. • **Vulnerable groups –** There are vulnerable people who may be poor or have limited access to land. There are also disabled community members. • **Religion –** The community's major religions are Christianity (75%), Islam (5%), and Traditional (20%). • **Women-headed households –** There are about 25 women headed households in the community. • **Indigenous people –** There are indigenous people in the community • **Support for the less privileged –** There is no support for the less privileged. The period in the year where local people face economic/financial difficulties is between June and September every year. • **Key decision-makers –** Assembly members, and Chiefs, are among the key decision-makers. The assembly member serves as government representative, and the community is satisfied with their representation in government decisions. • **Women in leadership -** Women are involved in decision making especially through women groups in the community. • **Local groups –** 'Susu' groups which contribute money for trading. • **Appointment of community leadership –** The community appoints its leaders mainly through inheritance. However, people are not forbidden from being an elder/ leader. • **Exiting traditional/Cultural groups –** There are no traditional/ cultural groups in the community. • **Festivals and sacred events/sites –** Festivals are not undertaken in the village. No sacred sites like shrines, will be impacted by the project. • **Health care –** In the community, there are no health facilities but the nearest clinic is the Tarikom CHPS compound. The nearest hospital is in Zebilla.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Educational facilities –** There is a primary school in the community, but no junior high or senior high school. The closest Senior High School is in Zebilla town, and the closest Junior High School is in Tarikom. • **Water supply and sanitation–** The community is supplied with water by borehole. • **Utility services –** Charcoal, and fuelwood are the main sources of energy. The community also has access to about 3 mobile phone networks. • **Quality of life –** Quality of life is described as moderate since there is peace and unity among the people. A closeness of the community to the town is a positive thing to the community. The provision of electricity, a dugout for irrigation during the dry season and a CHPS compound would make the community a better one. • **Priorities of community –** The community's top three priorities are health care, farming, and electricity.
Sitande, Bawku West	Braimah Abeliwin Lydia Avokba Atiah Agiparig Akulsum Akuka Atampuri Awinsuu Anamsaki Atampuri Ayaba Anamgat			08/12/2021	• **Community awareness of project –** The community is not aware of the project • **Land acquisition and involuntary resettlement –** Community not aware there may be land acquisition and resettlement as a result of the project. • **Project impact on Community –** Because the majority of the residents are farmers, the community believes the project will be beneficial. The community is concerned about external political interference, which could jeopardize the project's success. • **Land Ownership –** The community has no idea how much land the stool, private individuals, or the government own. • **Land use –** The land is primarily used for farming and animal husbandry. • **Land right and access** - The land can be accessed through a lease, individual land ownership, or rent. However, there are people who do not have access to or the right to use land, and they can only farm because land is leased or rented to them. There are no squatters present who may be impacted by land acquisition. • **Land-related conflict –** Community has not experienced any land-related conflicts. • **Livelihood activities –** The main livelihood activities are farming, livestock farming and petty trading. • **Livelihood challenges –** The community faces challenges such as access to water for farming during the dry season, capital acquisition, animal disease, crop pests, and a lack of inputs like fertilizer.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Community population –** There are about 1,231 people in the community. • **Ethnic groups –** The Kusaasi are the community's only ethnic group. • **Migrant population –** There are no migrants in the community. • **Vulnerable groups –** There are vulnerable people who may be poor or have limited access to land. There are also disabled community members. • **Religion –** The community's major religions are Christianity (75%), Islam (5%), and Traditional (20%). • **Women-headed households –** There are about 135 women headed households in the community. • **Indigenous people –** There are indigenous people in the community • **Support for the less privileged –** There is no support for the less privileged. The period in the year where local people face economic/financial difficulties is between June and October every year. • **Key decision-makers –** Assembly members, and Chiefs, are among the key decision-makers. The assembly member serves as government representative, and the community is satisfied with their representation in government decisions. • **Women in leadership -** Women are not involved in decision making. • **Local groups –** There are no local groups in the community. • **Appointment of community leadership –** The community appoints its leaders mainly through its members. However, people are forbidden from being an elder/ leader when they are not trustworthy. • **Exiting traditional/Cultural groups –** There are no traditional/ cultural groups in the community. • **Festivals and sacred events/sites –** The 'Samanpiid' festival is celebrated in the community. No sacred sites like shrines, will be impacted by the project. • **Health care –** In the community, there are no health facilities but the nearest clinic is the Tonde community clinic. The nearest hospital is in Zebilla. • **Educational facilities –** There is a primary school in the community, a junior high but no senior high school. The closest Senior High School is in Zebilla town. • **Water supply and sanitation–** The community is supplied with water by borehole. • **Utility services –** Charcoal, and fuelwood are the main sources of energy. The community also has access to about 3 mobile phone networks.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Quality of life –** Quality of life is described as moderate since there is peace and unity among the people. A closeness of the community to the town is a positive thing to the community. The provision of electricity, and a potable drinking water would make the community a better one. • **Priorities of community –** The community's top three priorities are health care, farming, and electricity.

SAVANNAH AGRICULTURE VALUE CHAIN DEVELOPMENT PROJECT (**SADP**)

AIR QUALITY, NOISE ASSESSMENT AND WATER QUALITY ANALYSIS

BAWKU WEST DISTRICT
(GOOGO COMMUNITY)

January, 2022

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ACRONYMS

GSA	- Ghana Standards Authority
LEQ	- Equivalent noise level
L10	- Nuisance noise level
L50	- Average noise level
L90	- Background noise level
Lmax	- Maximum Noise Level
PCMU	- Project Coordination and Management Unit
PM	- Particulate Matter
SADP	- Savannah Agriculture Value Chain Development Project
SAPIP	- Savannah Zone Agricultural Productivity Improvement Program

1.0 INTRODUCTION

1.1 Background

The Government of the Republic of Ghana with assistance from the African Development Bank, through the Feed Africa Strategy, seeks to develop the savannah areas as part of Government's ongoing efforts in Planting for Food and Jobs (PFJ) and Rearing for Food and Jobs (RFJ) programs. This support is to allow medium scale commercial farmers and their out growers to expand areas under cultivation for rice, soybean and maize under PFJ, which feeds into poultry value chain under RFJ. This integrated approach supports elements of growing at scale and provision of market outlets for smallholder farmers, especially women and youth.

The Savanah Agriculture Value Chain Development Project (SADP) is being implemented to serve as part of post COVID-19 reconstruction efforts aimed at addressing disruptions in food systems of the Government of Ghana.

The proposed project will have three components namely (i) Component 1: Production Development, (ii) Component 2: Integrated Agribusiness and Value Chain Development, and (iii) Component 3: Project Management and Institutional Support.

1) Production Development:

Increase the production of basic (foundation) seeds, production and promotion of certified hybrid maize and improved soybean seed, in collaboration with seed companies, Support to land development and mechanisation services, Training of producers, pack house operators and exporters on sanitary and phytosanitary (SPS) concerns relating to maize and soybeans, Farmer mobilisation and awareness creation, Train project staff and farmers on Integrated Crop and Pest Management (ICPM), including biological control options for the management of Fall Army Worm (FAW) and aspergillus on Maize and Soybeans, Conduct surveillance and collect data on pests affecting Maize and Soybeans in the project zones with specific reference to FAW.

2) Integrated Agri-Business and Value Chain Development:

Promotion of quality standards for maize and soybean production, storage and processing, Support the establishment of small-to-medium scale poultry processing units at district level, Support business development, including improvements in business processes of existing commercial farmers, Enhance access to market information (e.g. quantity, quality, timing and pricing), Expand Commercial Poultry Revolving Fund to finance inputs to small-to-medium scale women/youth poultry farmers, Support Co-Financing Opportunities with Ghana Exim Bank, Agriculture Development Bank, etc.

3) Project Management and Institutional Support:

Development of annual work plan and budget, establishment of results-based monitoring and evaluation system, Conduct Beneficiary Impact Assessment. Conduct Project Mid-Term Review, Conduct Project Completion/Technical Review (PCR), Video and pictorial documentation of

success stories, Support to the coordination and implementation of Rearing for Food and Jobs, undertake relevant studies, including socio-economic surveys, soil suitability surveys etc.

A total of 9 districts have been earmarked for the implementation of the project (**figure 1**).

Figure 1: Map of Ghana showing the 9 districts selected for project implementation

SAL Consult Ltd has been contracted to carry out the Environmental and Social Impact Assessment study which includes a baseline study for air quality, noise assessment and water quality. The field activities were undertaken between 16th January, 2022 and 29th January, 2022 and this report provides the outcome of the field study in Googo community (**Figure 2**) a selected community in the Bawku West District.

1.2 Purpose of Environmental Quality Monitoring

The aim of this monitoring is therefore to gather relevant environmental quality data with respect to Ambient Air, Noise Levels and Water Quality to describe baseline conditions at the project site. The data gathered will provide useful information to help monitor its operational impacts on the environment, health and safety of its employees and surrounding neighbors.

1.3 Objective

The objectives of the monitoring are to:

- Measure the concentration of particulate matter ($PM_{2.5}$ & PM_{10}) at selected locations within the project catchment area
- Measure ambient noise levels at selected locations within the project catchment and neighboring communities.
- In-situ testing of nearest water bodies for the following parameters
  - pH;
  - Conductivity;
  - Total Dissolved Solids; and
  - Temperature
- Laboratory testing of nearest water bodies for the following parameters
  - Turbidity;
  - Total Suspended Solids;
  - Nitrate-Nitrogen;
  - Phosphate-Phosphorus;
  - Alkalinity;
  - Chlorine;
  - BOD;
  - COD;
  - Oil/Grease;
  - Iron ; and
  - Manganese

1.4 Compliance Criteria

In this report, ambient air quality results are compared with the GSA Standard, Environmental and Health Protection Requirements for Ambient Air Quality and Point Source/Stack Emissions (GS 1236:2019). Noise data is compared with the Health Protection- Requirements for Ambient Noise Control of the Ghana Standards Authority (GS 1222:2018). These standards are provided in the tables below.

Table 1: Environment and Health Protection- Requirements for Ambient Air Quality and Point Sources/Stack Emissions.(GS 1236:2019)

#	Air Quality Parameter	Maximum Limits	Averaging Time
1	Carbon Monoxide, µg/m^3	100 60 30 10	15 minutes 30 minutes 1 hour 8 hours
2	Sulphur Dioxide (SO_2), µg/m^3	150	24hours
3	Nitrogen Oxides (measured as NO_2), µg/m^3	150	24hours
4	Total Suspended Particulate, µg/m^3	150 100	24hours 1 year
5	PM_{10}, µg/m^3	70 70	24hours 1 year
6	$PM_{2.5}$, µg/m^3	35	24hours
Shaded rows show applicable guidelines to this study			

Table 2: Health Protection-Requirements for Ambient Noise Control (GS 1222:2018)

Zone	Description Area of Noise Reception	Noise Level, dB(A)	
		Day (06:00-22:00)	Night (22:00-06:00)
A	Residential Areas	55	48
B	Educational (School) and health(hospital, clinic) facilities, office and law courts	55	50
C	Mixed used (Residential areas with some commercial or light industrial activities)	60	55
D	Areas with some light industry, places of entertainment or public assembly and places of worship	65	60
E	Commercial areas	75	65
F	Light industrial areas	70	60
G	Heavy industrial areas	70	70
Shaded row shows applicable guidelines to this study			

2.0 ENVIRONMENTAL MONITORING METHODOLOGY

The methodology for sampling the various parameters are discussed in this section. Particulate matter and noise were both monitored at the same time; thus all parameters were monitored under the same weather conditions.

2.1 Sampling locations

Sampling was done within the Googo community in the Bawku West District. This community was selected as a beneficiary community of the upcoming SADP project.

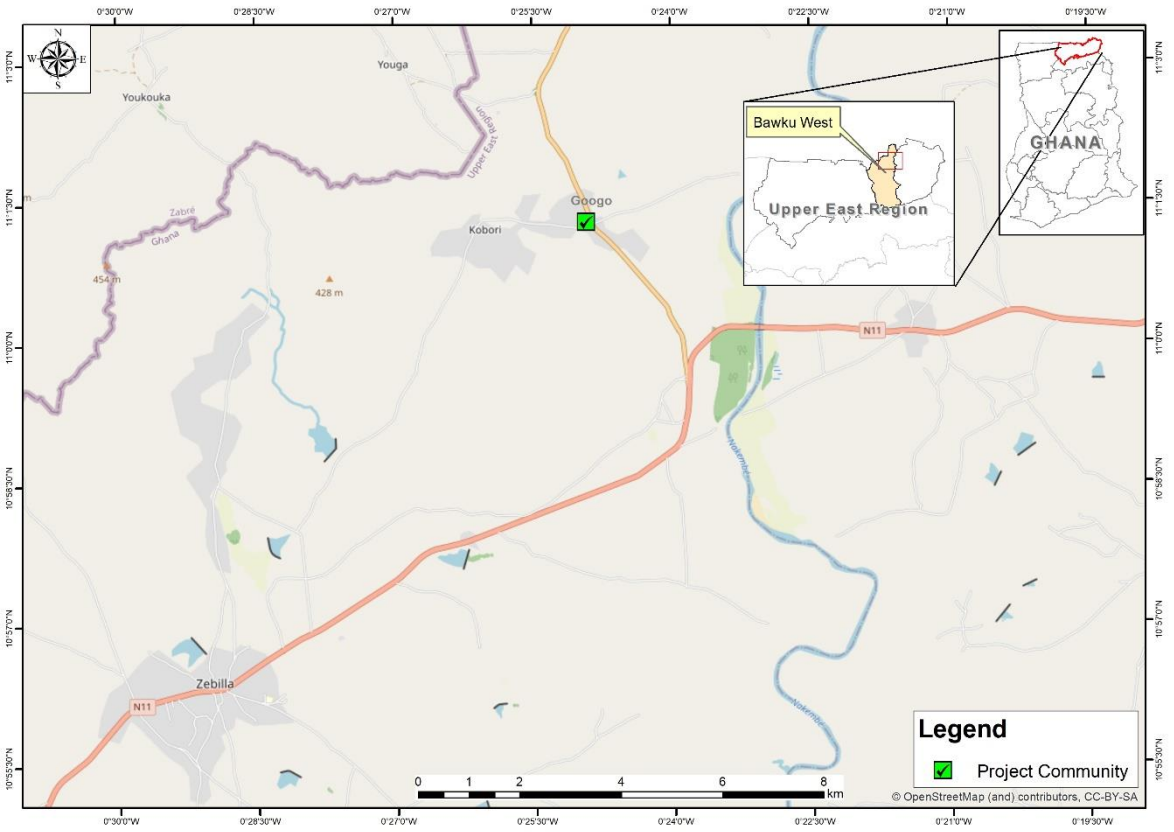


Figure 2: Location Map showing Googo community

2.2 Sampling Location and Weather conditions

Table 3 and 4 below shows the details of the weather conditions and GPS locations of the sampling locations

Table 3: Details of Air and Noise sampling, locations and weather conditions.

	DATE AND TIME		WEATHER CONDITION					
	DATE	**TIME**	**Longitude**	**Latitude**	**Temp.**	**Relative Humidity**	**Atmospheric condition**	**Wind Direction and Speed**
PM_{10}	26/01/22	24HRS	-1.802546	10.861575	32^0C ($H:34^0$)	8%	Clear/dry	NE 21Km/hr
$PM_{2.5}$	26/01/22	24HRS	-1.802546	10.861575	32^0C ($H:34^0$)	8%	Clear/dry	NE 21Km/hr
NOISE ASSESSMENT Daytime	26/01/22	12HRS	-1.803117	10.861248	32^0C ($H:34^0$)	8%	Clear/dry	NE 21Km/hr
NOISE ASSESSMENT Nighttime	26/01/22	12HRS	-1.803117	10.861248	32^0C ($H:34^0$)	8%	Clear/dry	NE 21Km/hr

Table 4: Details of water testing locations

	Date	Sampling code and description	Longitude	Latitude
WATER SAMPLING	26/01/22	BW – White Volta	-1.806007	10.860647

Figure 3: Satellite Imagery showing sampling locations

2.3 Particulate matter monitoring

The sampling and analysis of ambient particulate matter concentrations was done according to the ASTM Test Method D4096-17.

Particulate matter was sampled for 24 hours using ARA N-FRM Air Sampler set to a flow rate of 16.7 L/min. The sampler draws air through the inlet onto a 47mm quartz filter for analysis. The quartz filter paper was stabilized for a minimum of 24 hours before and after sampling in a desiccator.

The ARA N-FRM air sampler is equipped with a RTP profiler, which uses a Plantower light-scattering sensor to provide real-time data for two size ranges approximating PM10 and PM2.5. It shows trends during the sample run, supplementing the filter data.

The fresh quartz filter paper was weighed before sampling. After the 24-hour sampling period, post sampling filters were weighed and the difference in weight (W2-W1) was used to calculate the concentration of the particulate matter in $\mu g/m^3$ using the formulabelow.

$$(PM_{2.5}\ \&\ PM_{10})\ \mu g/m^3 = \frac{\text{Net dust weight } \mathbf{X}\ 10^6\ \mu g\ \mathbf{X}\ 1000L}{\text{Flow rate (L/Min) } \mathbf{X} \text{ Sampling time (Min)} \mathbf{X}\ 1g\ \mathbf{X}\ 1m^3}$$

NB: $10^6 \mu g = 1g$ *(since the unit of measurement of the balance is in grams);* $1000L = 1m^3$ *(Since flow rate is in L/min)*

Photo of equipment mounted for PM_{10} and $PM_{2.5}$ sampling is provided in Plates 1 below:

Plate 1: ARA N-FRM sampler mounted for Ambient Air Quality Monitoring

2.4 Ambient Noise

Sound is energy that travels in waves and is measured in frequency and amplitude. Frequency, reported in Hertz (Hz), measures the number of sound vibrations in one second. Amplitude, reported on the decibel (dB) scale, measures its pressure or forcefulness. The more amplitude a sound has, the louder it is.

A decibel (dB) is therefore the unit for the measurement of noise. The zero on a decibel scale is at the threshold of hearing, the lowest sound pressure that can be heard on the scale 20 dB which is a whisper, 40 dB the noise in a quiet office, 60 dB is normal conversation, 80 dB is the level at which sound becomes physically painful.

Noise measurements/recordings were taken with a High Precision TSI Quest Sound Level Meter, Model Type 1. The sound level meter has an in-built calibrator and was calibrated before each measurement/recordings were taken. The noise meter was calibrated at 114 dB (A) prior to the measurement.

The following statistical indices was computed:

- Lmax
- Lmin
- LAeq
- L10
- L50
- L90

Photo of equipment mounted at the selected location for noise monitoring is provided in Plates 2.

Plate 2: Noise monitoring in the Googo community

2.5 Water Sampling

Water testing was done at the nearest water source (White Volta) a few meters away from the community. This source is within the project area of influence and potential recipient of any pollution impact from the project.

The White Volta is mostly used for vegetable farming, animals and the vegetable farmers drink when thirsty.

The white volta was tested on the, 26th January 2022 at 10:12am. Parameters including Temperature, pH, TDS and Conductivity were measured in-situ by means of field kit (Plate 4). Calibration reagents are used to calibrate the Field Test Kit before each use.

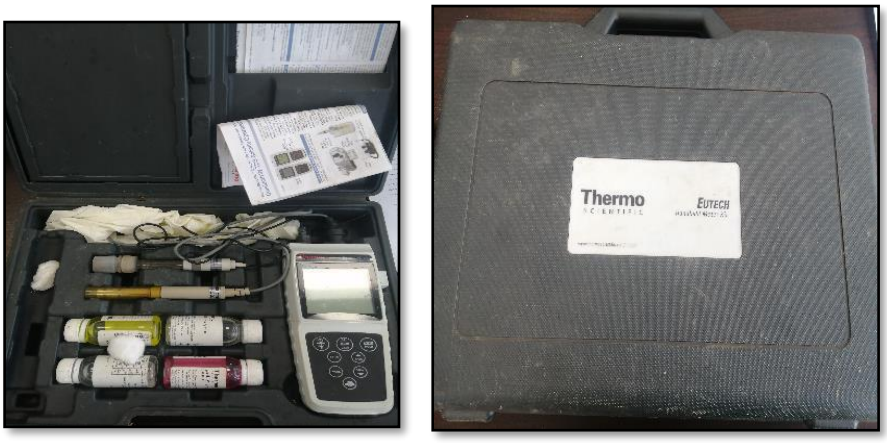


Plate 3:Thermo Scientific EUTECH Handheld Meter Kit

Plate 4: White Volta sampling and in-situ testing.

3.0 RESULTS AND DISCUSSIONS

3.1 Air Quality

The ambient air quality and noise monitoring results are provided in Table 5, 6 and 7 below.

3.1.1 Ambient Particulate Matter ($PM_{2.5}$, and PM_{10})

The 24-hour $PM_{2.5}$ and PM_{10} concentrations measured at the Googo community were **13 µg/m³ and 34 µg/m³** respectively (See **table 5**).

Table 5: Summary of Ambient $PM_{2.5}$ and PM_{10} Results Measured at Googo community

Location	$PM_{2.5}$ (µg/m$^{3)}$	PM_{10} (µg/m^3)
Googo Community	**13**	**34**
Ghana Standards (GS 1236:2019) value for 24-hour ambient air quality for PM_{10} and $PM_{2.5}$	*35*	*70*
WHO Ambient Air Quality Guidelines for 24-hour for PM_{10} and $PM_{2.5}$ (Source:www.ifc.org/ehsguidelines)	*25*	*50*
Sampling dates: 25th to 26th January 2022		

- The concentrations of $PM_{2.5}$ and PM_{10} values are within the Ghana Standards (GS 1236:2019) and WHO Ambient Air Quality Guidelines for 24-hour for PM_{10} and $PM_{2.5}$ IFC guideline values.
- Thus, the ambient air quality at the Googo community complied with the GSA standard.

3.2 Ambient Noise

3.2.1 Daytime Ambient Noise Levels

The Table 6 below shows the measured daytime noise levels at the Googo community. The daytime ambient noise levels (LEQ) recorded was 58.7dB(A) at the Googo Community.

Table 6: Day Ambient Noise Results.

Location	L_{EQ}	L_{10}	L_{50}	L_{90}	L_{MAX}
Googo Community	**58.7**	**61.2**	**56.5**	**51.9**	**81.0**
Ghana Standards (GS 1222:2018) for daytime Mixed use (Residential areas with some commercial or light industrial activities) 06:h00-22h00	*60*				
IFC Noise Level Guidelines for Residential, Institutional, Educational Facilities Day. (07:00-22:00) (Source:www.ifc.org/ehsguidelines)	*55*				
IFC Noise Level Guidelines for Industrial, Commercial facilities Day (7:00-22:00) (Source:www.ifc.org/ehsguidelines)	*70*				
Monitoring date: 26th January, 2022					

- From the Table above, the daytime noise levels complied with the GSA standards at the Googo community.
- During the monitoring, the observed sources of noise were from intermittent vehicular movement around, braying of donkeys and some form of chatter amongst community members around.

3.2.2 Nighttime Ambient Noise Levels

The Table 7 below shows the measured nighttime noise levels at the Googo community. The nighttime ambient noise levels (LEQ) recorded was 51.3 B(A) at the Googo Community.

Table 7: Night Ambient Noise levels (dBA) recorded.

Location	LA_{EQ}	L_{10}	L_{50}	L_{90}	L_{MAX}
Googo Community	51.3	53.5	50.5	46.7	64.0
Ghana Standards (GS 1222:2018) for nighttime Mixed use (Residential areas with some commercial or light industrial activities) 22h00-06h00	55				
IFC Noise Level Guidelines for Residential, Institutional, Educational Facilities Day. (22:00-7:00) (Source:www.ifc.org/ehsguidelines)	55				
IFC Noise Level Guidelines for Industrial, Commercial facilities Day (22:00-7:00) (Source:www.ifc.org/ehsguidelines)	70				
Monitoring date: 26th to 27th January 2022					

- From the Table above, the nighttime noise levels complied with the GSA standards at the Googo community.
- During the monitoring, the observed sources of noise were from the rustling of winds, chatter amongst community members, children playing and crickets chirping.

3.2.3 Surface water Quality

The quality of the White Volta against WHO drinking guidelines is provided in **table 8** .

Table 8 Comparison of water Quality against WHO drinking water quality guidelines.

Parameter	White Volta	WHO drinking water quality guidelines
Ph	8.01	6.5 – 8.5
Conductivity, µS/cm	103.6	-
TOTAL DISSOLVED SOLIDS (TDS)	55.56	1000
TEMPERATURE	20.3^0C	-
TURBIDITY	155	-
TOTAL SUSPENDED SOLIDS (TSS)	116	-
NITRATE-NITROGEN	0.262	50
PHOSPHATE-PHOSPHORUS	1.94	
ALKALINITY	56.6	-
CHLORIDE	11.4	250
BOD	16.4	-

COD	118	-
OIL/GREASE	1.80	-
IRON	1.29	0.300
MANGANESE	0.050	0.400

4.0 CONCLUSION

Air Quality

The Particulate Matter ($PM_{2.5}$ & PM_{10}) concentrations monitored at Googo Community was found to be within the Ghana Standard (GS 1239:2019) permissible values of 35 and 70 ($\mu g/m^3$). The monitoring team did not observe much activities in the communities that could have significant influence on the air quality at the time of the assessment.

Noise Monitoring

The ambient noise levels (LEQ values) recorded were compared to their respective Ghana Standard (GS 1222:2018) and IFC guideline values.

The daytime ambient noise levels (dBA) for the project site was below the GSA and IFC LA_{EQ} guideline values.

The nighttime ambient noise level (dBA) for the project site was also below the GSA and IFC LA_{EQ} guideline values.

Surface water quality

Parameters analyzed were below the WHO drinking water guidelines, showing that the quality of the White Volta River is generally good.

Annex 7 Pictures of Engagement

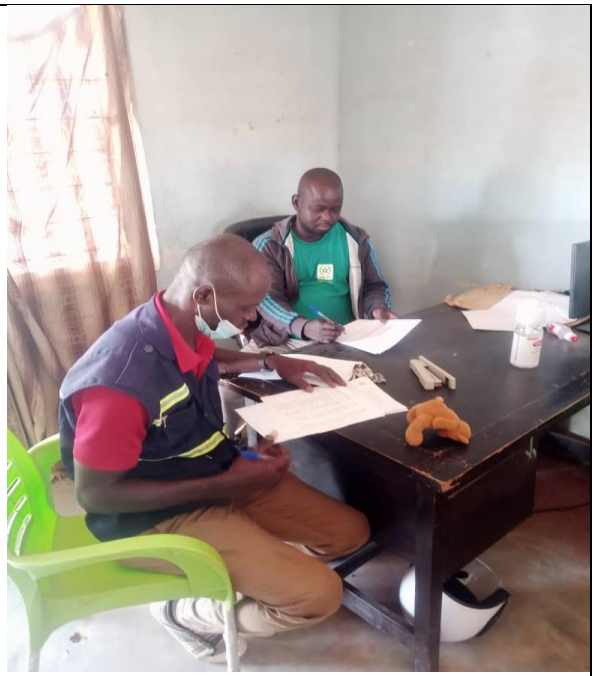
Some photographs taken during the stakeholder engagements are presented below

Meeting with the Head of Agric Department, Bawku West District

Consultation with the NADMO Director, Bawku West

Plate 1: Meetings with Project Proponents

Ghana National Fire Service, Bawku West



Care International NGO, Bawku West

Commercial farmers at Aramkoliga, Zebilla, Bawku West District

Commercial farmer at Tilli, Bawku West

Interactions with Alaamtum Women's Groups in the Gbere Community, Bawku West

Meeting with the Asungtaba Women FBO in the Boya Kpalsako Community, Bawku West

Chief of Bringu Community

Interactions with farmers at Sitande

Plate 2: Meetings with other stakeholders