MINISTRY OF FOOD AND AGRICULTURE

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA)

FOR

SAVELUGU MUNICIPALITY SUB-PROJECTS

SAVANNAH AGRICULTURE VALUE CHAIN DEVELOPMENT PROJECT (SADP)

FINAL REPORT

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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
SaMA	Savelugu Municipal Assembly
UNFCCC	United Nations Framework Convention on Climate Change
WRC	Water Resources Commission

NON-TECHNICAL EXECUTIVE SUMMARY

0.1 OVERVIEW OF THE PROJECT

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) 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.

No	Component Name	Sub-Component and Activities
		• 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
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 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
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 Savelugu Municipality

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

0.4.1 Preparatory Phase

- Identification of beneficiary farmers 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.

Savelugu 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

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 Standards for Drinking Water (GS 175:2017 5th);
- 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 Savelugu Municipality

The Savelugu Municipality, with Savelugu as the administrative capital, is located in the Northern Region of Ghana. It was carved out of the Western Dagomba District Council in 1988 under the Local Government Act 462, 1993 by Legislative Instrument (LI) 1450. Nanton District was also subsequently carved out of the then Savelugu Nanton Municipal Assembly changing the name currently to Savelugu Municipal Assembly. The Municipality, covering an area of 1,599 sq. km., is bounded to the north by West Mamprusi Municipal, to the south by Sagnerigu Municipality, to the east by South Karaga and Nanton Districts, and Kumbungu District to the west.

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 Savelugu Municipality, where the project communities are located.

0.6.3 Indirect influence area: Savelugu Municipality

The entire Savelugu Municipality is largely the indirect influence area as all the beneficiary communities fall administratively under the Savelugu Municipal Assembly.

0.7 Environmental baseline conditions and major environmental stakes/challenges

0.7.1 Physical Environment

The land in the municipality is generally flat with gentle undulating low relief throughout. The general range of the altitude for the municipality ranges from 400-800 ft. above sea level. The northern part of the municipality has some gentle slopes whiles the southern part is characterised by some slight hills. The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the municipality and Kumbungu District. There are other waterbodies such as the Oxbow Lake, rivers and streams. The effect of the drainage system is felt mostly in the northern part of the Municipality covering the areas between Nabogu and Kukuobilla. These areas are prone to periodic flooding during the wet season, thus making them suitable for rice cultivation.

The municipality's geology is Middle and Upper Voltaian in age. The shale and mudstone of the Upper Voltaian cover the southern section of the Municipality. This underlying rock formation, which has a different water potential for subterranean water than the higher Voltaian formation, determines subsurface water potential in general. Sandstone, shale, and siltstone make up the middle Voltaian, which covers the northern portion of the Municipality. As a result, borehole drilling in the northern half is likely to be more successful than in the southern section.

With an average rainfall of 600mm, the region has a dry and rainy climate. The season begins with sporadic rainfall in April, which intensifies as the season progresses, with the average rainfall rising from 600mm to 1000mm. The district's average temperature is 34°C, with temperatures ranging from 42°C to 16°C. The dry harmattan winds, which bring high temperatures and low humidity, encourage high rates of evaporation and transpiration, resulting in water shortages.

0.7.2 Biological Environment

The area is in the interior (Guinea) Savanna woods, which has drought-resistant flora that does not entirely shed its leaves throughout the lengthy dry season. The less inhabited northern section of the municipality contains richer vegetation, largely secondary forest, but the densely populated south has been degraded by human activities like as farming, bush burning, and tree chopping, among others. Shea trees (which give nuts for producing sheabutter) and dawadawa trees (which provide seeds for

condiments) are two notable plants. The majority of these are economically valuable and serve as key sources of income, particularly for women. Large-scale cattle husbandry, as well as the production of staples like as rice, groundnuts, yams, and cassava, are possible in the area.

0.7.3 Social baseline conditions and major social stakes/challenges

The District Assembly, led by the District Chief Executive, is the district's primary administrative organisation. The municipality has 22 decentralised departments to handle various concerns in the district in order to increase decentralisation, and there are additional authorised governance structures in the district that strive to aid with governance and planning within the district. Traditional authority, youth associations, religious entities, and development partners are among these groups. The zonal councils are the district's four sub-government bodies. The Savelugu, Pong Tamale, Diare, and Moglaa Zonal councils are the ones in question. The district's highest decision-making body, the general assembly, is comprised of 36 elected officials, 16 appointed officials, two members of parliament, and the municipal chief executive.

The population of the Municipality, according to 2021 Population and Housing Census, is 122,888 comprising 60,390 (49.1%) males and 62,498 (50.9%) females. With a growth rate of 3%, the population of the Municipality is 130,825 in 2021. The population growth in absolute terms within the medium-term period (2010 to 2017) is 11%. Females constitute 51.5% of the population and males 48.5%. This indicates a sex ratio of 94.1 males per 100 females. The population density in 2010 was 78 persons per sq. km and in 2025 it is expected to be 93 Persons per sq. km. The municipality has a high level of illiteracy with 69.2% of the population 11 years and older incapable of reading or writing in any language. In terms of sex, approximately 78.5% of females 11 years and older cannot read or write with that of males constituting 59.1%. Thus 7 out of every 10 females in the municipality cannot read and write.

The sanitation and waste management situation is poor as 67.2% of the households have no toilet facility thereby resorting to open defecation. The percentage of households which use the public toilet (WC/KVIP/pit pan) constitute 19.5%. About 59.5% of urban households and 72.5% of the rural households have no toilet facilities. About 32.3% of the urban households use public toilet (WC/KVIP/pit pan), while in the rural areas, 10.9% households use the KVIP.

Agriculture is the mainstay of the people employing 74.1% in the areas of skilled agriculture, forestry and fishery works. Crop farming dominates (97.0%) the types of agricultural activities engaged in followed by livestock farming (68.7%). Other employment avenues include, elementary occupation, craft and related trades, and service and sales work.

The land tenure system which is predominantly customary, operates under the patrilineal mode of property inheritance. Although this system has recorded considerable changes with regards to land transfer due to population pressures, urbanization, commercial agriculture and legislative interventions, it remains male inclined. It thus excludes women from ownership and limit access rights by inheritance. In most cases, women in the district rely on “borrowed lands” for use which is granted

based on their status to males as relatives- daughters, sisters or wives. This short-term interest can be terminated at any time by the owner, hence exposing women to tenure insecurity.

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 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.

Impact on livelihoods

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.

Project activities such as land clearing could destroy some economic trees like dawadawa and shea. Women are known to pick fruits of these wild trees and sell as a means of livelihood. Since these trees grow in the wild, picking can be done in other areas.

The impact is local and the displacement will be temporary as alternative sites exist. The impact is therefore considered 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. Herdsmen can practice the cut and carry system i.e. grass is cut and carried to feed animals to avoid any potential conflicts over access. Women earning a living out of shea and dawadawa picking should be considered for employment both during construction and operation phases of the project. It is recommended that the capacity of women is built so they can own and run small and medium scale enterprises that will provide services to the project and the community at large. Also, preparation of a detailed RAP will be required to fully assess the impact on livelihood.

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 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.

Flooding

The project area is a known flood-prone area with inundation mainly from the White Volta and its tributaries (Galdani, Jamfini, Zonchaw, and Kulsoo), that run through the beneficiary communities, overflowing their banks. The proximity of project communities (between 0.2km and 1km) to these water bodies, coupled with the annual (August/September) spillage of water from the Bagre Dam in Burkina Faso, presents a high probability of project sites getting flooded. Flood events could lead to disruption of livelihood activities, loss of property and even lives. Also, supply chains could be disrupted by loss of infrastructure such as bridges in flood events. This impact is regional, severe yet temporary hence considered major.

Flood events have the potential of disrupting the implementation of the project in the municipality unless farmers are discouraged from siting their farms within or close to river beds. Other mitigation measures include collaboration with spatial planning and disaster management agencies, using disaster maps and systems to stay away from flood-prone areas. Infrastructure for agricultural establishments should be constructed preferably on higher grounds or an artificial elevation. Workers and the community must be educated on early warning signs of flood and insurance cover provided for equipment and personnel.

0.8.2 Construction and Operation Phase Negative Impacts

Soil degradation

<u>Construction</u>

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 wind 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 transport of materials using un-serviced/poorly maintained vehicles 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 that drain the area such as the Kpalsini, Klubon, Juni, Yelbonni are only between 0.8km and 4km away from project communities and could be the direct recipient or indirect recipient of pollutants from its tributaries. The extent of the impact could be regional over a limited duration and cumulative in nature 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. 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, reduce its quality and make 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.

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 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

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 such as lack of welfare facilities, restriction of freedom of association or speech and the absence of a grievance redress mechanism. If the necessary actions are not put in place to guarantee workers right and stipulate conditions of service to ensure that proper working conditions are implemented on the project. 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 contracted 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.

Traffic management

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 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 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.

Snake bite risks

Women and any other persons collecting dawadawa and shea fruits are likely to be exposed to snake bites. Impacts of this risk include reduction in productivity of victims who skip work to seek treatment, prolonged illness or premature death due to unavailability or high cost of anti-snake venom (USD 100

per vial). Considering that victims require 3 to 8 vials, health facilities may not have adequate supplies, and victims may resort either to traditional medicine (that may be ineffective) or they will not seek treatment at all. This impact is localised, temporary and average in intensity as it can lead to hospitalization and even death. It is therefore considered moderate in significance.

Pickers should be provided with picker tools and PPE such as wellington boots either for free or at a subsidised price to prevent them from picking with their bare hands and reduce their exposure to bites. Project to identify a local health facility with regular supply and adequate stock of vials and designate as a referral facility for snake bites. Locals should be sensitized on the importance of avoiding snakes and seeking early medical help after snake bites.

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 be 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, PCU, EPA, Fire Service, Savelugu Municipal 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	17/11/2021	Savelugu	3	0
	Project Coordinating Unit	18/11/2021	Tamale	2	0
Regulatory Institution	Environmental Protection Agency	21/06/2022	Tamale	1	1
	Fire Service	20/11/2021	Savelugu	3	1
Other Government Institutions	Lands Commission				
	Regional Coordinating Council				
	Savelugu Municipal Assembly	23/11/2021	Savelugu	3	1
	National Disaster Management Organization	23/11/2021	Savelugu	3	0
	Rural Enterprises Project				
Other stakeholders	Commercial Farmers	22/11/2021	Savelugu	4	0
	Suppliers	20/11/2021	Savelugu	2	0
	FBOs/FBGs	19/11/2021	Savelugu	5	0
	NGOs				
	Farmers	22/11/2021	Sawaba	4	0
		22/11/2021	Nakpanzoo	6	0
		23/11/2021	Diare	7	2
		23/11/2021	Gushie	5	0
	Women's Group	23/11/2021	Tindang	20	20

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 monitoring** – soil tests should be conducted to ascertain suitability of soils for commercial establishments, competent technical staff should be employed for effective implementation, and adequate funding should be provided for effective project implementation and monitoring.
- **Coordination and cooperation** - The Municipal Assembly and other institutions like Lands Commission, Fire Service etc. should be involved in project implementation and provided with resources, where necessary. Particular collaboration is required to prevent pest invasion such as that of the Fall Army Worm.
- **Sensitization** – Farmers, assembly men and project communities should be sensitized on the project to enable them to fully participate in the project.
- **Marketing and Pricing** - More feed mills must be made available, if necessary, by the project to process produce into food. Standard weights and prices of goods should be set through consensus to deter some unscrupulous middlemen from exploiting farmers or producers.
- **Socio-economic issues** – Activities of Fulani herdsmen should be checked or projects sited away from such areas. The livelihood of the beneficiaries should ultimately be positively impacted by the project. Also, the standard of living in beneficiary communities should be improved through provision of social amenities like potable water, good roads, and healthcare units.
- **Environmental issues and natural disasters** – Flooding is major issue and measures should be put in place to mitigate its effects. To cater for natural disasters such as drought and flooding, there is the need for the project to provide insurance for crops. Also, to protect water bodies, farming around water bodies should be prohibited. Fire belts should be created around project sites to prevent the occurrence of fires. Locals should be trained as fire volunteers to support the Fire Service.
- **Financial support** - The project should help create access to affordable credit as 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 reduced to suppliers.
- **Provision of farm inputs and machinery** - The project should provide farm inputs like viable seeds 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 stool lands and can be accessed through a request from the traditional authorities. Squatting and land-related conflicts are rare.
- **Vulnerable groups** - There are some women-headed households and persons with disability who have limited access to land and no livelihood support.
- **Community challenges** - Communities have challenges with changes in rainfall pattern, lack of ready market and post-harvest losses.

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 pasture and loss of economic trees	Preparatory	• 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. • Encourage locals to practice the cut and carry system • Consider employing local women as part of project implementation • Build capacity of women to own and run businesses that will provide services to the project. • Prepare a RAP to assess impact on livelihood	PCU	Environmental and Social Safeguards Specialists of PCU	5,000
Destruction of vegetation and displacement of wildlife	Preparatory	• 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
Flooding	Preparatory	• Site preparation	• Avoid	• Educate workers and community on early warning signs of flood	PCU	Environmental and Social Safeguards	5,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Discourage the siting of farms within or close to river beds • Collaborate with spatial planning and disaster management agencies, using disaster maps and systems, to stay away from flood-prone areas • Infrastructure for agricultural establishments should be constructed preferably on high grounds • Provide insurance cover for equipment and personnel		Specialists of PCU	
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. • Ensure the use of nose mask in dusty environment. • Service vehicles and equipment regularly	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. • Ensure proper waste management	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.	Works contractor	Environmental Safeguards Specialist of PCU	5,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• 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.			
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.	Works contractor	Environmental Safeguards Specialist of PCU	20,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• 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	Construction	• Project 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.	Works contractor	Environmental and Social Safeguards Specialists of PCU	10,000
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
Security concerns	Construction	• Project site	• Abate or reduce at source,	• Provide adequate security by liaising with Police to conduct regular patrols	Works contractor	Environmental and Social Safeguards	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
			abate on site	• Sensitize local community on cultural tolerance and grievance mechanisms to prevent confrontations		Specialists of PCU	
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
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.	Facility manager	EPA, Agric Department, District Assembly EHU	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Suppress dust by watering dusty construction areas. • Ensure the use of nose mask in dusty environment.			
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 and implement a Pesticides Management Plan • Treat waste at source before discharge	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. • 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.	Facility manager	EPA, Agric Department, District Assembly EHU	8,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
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 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.	Facility manager	EPA, District Assembly EHU	8,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• 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 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
Snake bite risks	Operation	• Project community interactions	• Avoid or reduce at source	• Provide pickers with picker tools and PPE at subsidized rate to reduce exposure to bites • Identify a local health facility with regular supply and adequate stock of vials and designate as a referral facility for snake bites.	PCU	Environmental and Social Safeguards Specialist	5,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Sensitize locals on the importance of avoiding snakes and seeking early medical help after snake bites			
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 • 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	Facility manager	EPA, District Social Welfare Department	10,000
TOTAL COST OF ESMP IMPLEMENTATION							**266,000**

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 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

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
	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 • 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						
	Workplace accidents/incidents	• Records of accidents, incidents and near misses. • Records of PPE disbursed • Housekeeping	• Facility site	Monthly	HSE Manager	3,000

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
	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
	Water Quality	• GS 175:2017 5th Relevant Parameters where discharge is into community stream • GS1212, 2019 Relevant Parameters where discharge is into public drain • Temperature, pH, Conductivity, DO, BOD, Suspended solids, Nitrate, Phosphate, Oil/ Grease, Nickel, Cadmium, Coliforms (total and faecal)	• Facility's immediate environs	Bi-annually	HSE Manager and Community Liaison Officer	2,000
	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 disposal	• Presence of toilets and number dustbins provided on site • Number of times waste is lifted in a week • Cleanliness of site/housekeeping • Odour	• 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)
		• Presence of human waste on site • Complaints by workers/residents				
	Traffic management/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 (11 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**			**266,000**	
	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			**1,091,000**	

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, and (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 Savelugu Municipal Area. 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, Savelugu Municipality), Environmental Protection Agency (EPA) of Ghana, Savannah Zone Productivity Improvement Program (SAPIP) and Savannah Investment Programme (SIP), Savelugu Municipal 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 19 – 25, 2021 and the outcome 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 Savelugu Municipality;
  - 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 Savelugu Municipality;
- 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 Savelugu Municipality, 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
Savelugu Municipal Area	Nakpanzoo	Kukobila
	Gushei	Napanzo
	Diare	Dinga
	Chai Yaoalisi	
	Nambagla	
	Pigu	
	Nabogu	
	Kukobila Tamaligu	
	Zonchacni- Wayayo	
	Zosali	

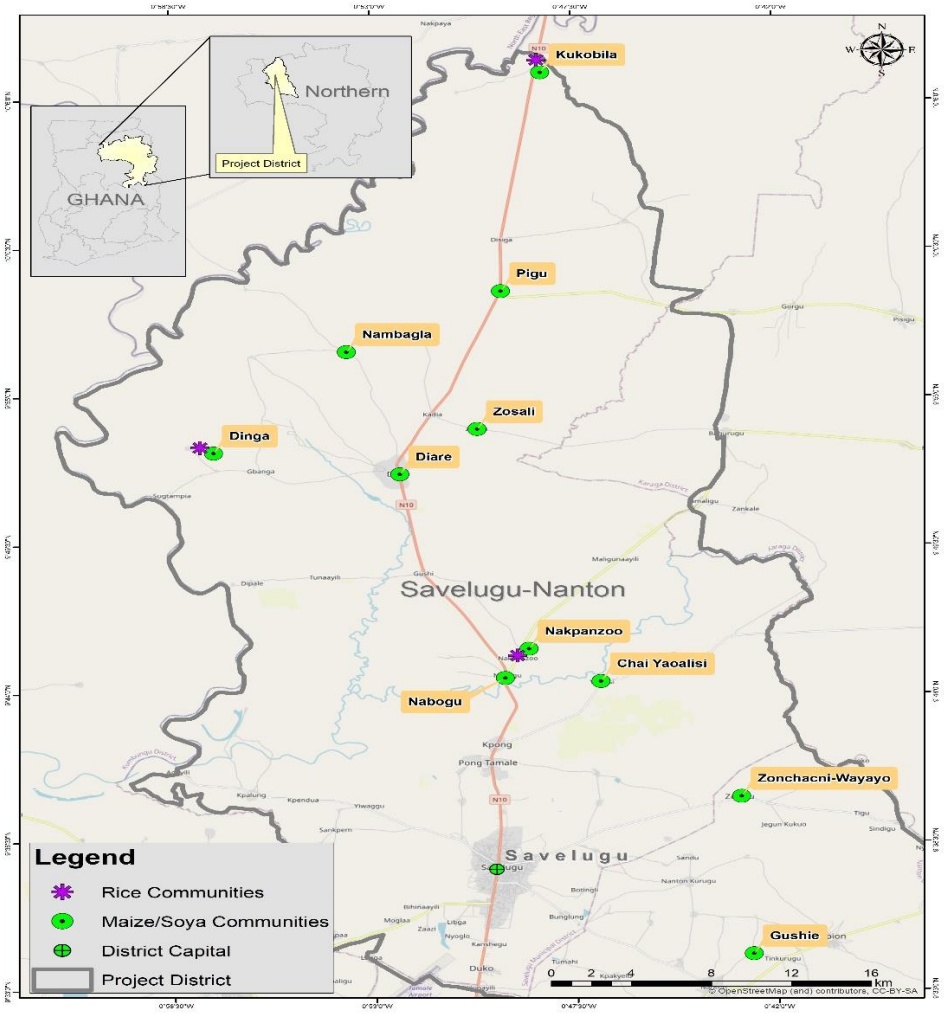

Figure 2- 1: Location map of Savelugu Municipality showing potential beneficiary communities

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 Savelugu Municipality

The specific project activities to be implemented in the Savelugu Municipality 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 3. Rice varieties are drought tolerant	**Disadvantages** 1. It is largely for subsistence production 2. Soils are usually nutrient deficient 3. Have lower yield 4. Susceptible to weed invasion and diseases	**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
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 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	**Disadvantages** 1. Very costly compared to other irrigation systems. 2. Requires highly skilled labour in design, installation and operation. 3. Highly sensitive to clogging.	

Option/ Method of Deployment	Potential Environmental, Social, Technological and Economic Implications		Preferred Option
	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.		
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 2. Seasonal variations are minimal 3. Relatively stable water quality	**Disadvantages** 1. Expensive to access and abstract 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	**Option 2, which is the use of surface water appears to be 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	

Option/ Method of Deployment	Potential Environmental, Social, Technological and Economic Implications		Preferred Option
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. 4. Good for waste that is non-recyclable.	**Disadvantages** 1. Completed landfill areas can settle and requires maintenance. 2. Requires proper planning, design, and operation. 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;
- Environmental Impact Assessment Guideline for the agricultural Sector (EPA, 2010)
- Ghana Standard for Drinking Water (GS 175:2017 5th)
- 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.	**Environmental Impact Assessment Guidelines for the agricultural Sector (EPA, 2010)** The Agriculture Sector Guidelines is meant to assist the Environmental Protection Agency (EPA) in the implementation of its Environmental Impact Assessment procedures in Ghana. The document is in two parts. Part I deals with the background and methodology. Areas covered include overview of the agricultural sector, environmental assessment processes, environmental management programme and project decommissioning. Part II covers information and tools used in the environmental impact assessment. This includes the legal framework for EIA procedures in agriculture, general screening criteria, environmentally sensitive areas in agriculture and impact identification, evaluation and mitigation measures.	These guidelines were taken into consideration in preparing this ESIA report. Also, all other project activities will follow these guidelines

No.	Legal Framework and Key Compliance Requirements	Applicability to Proposed Project
	It is intended to provide guidelines that will be used through all stages of an Agricultural Project Cycle; i.e. identification, preparation, appraisal, implementation and post-implementation monitoring.	
33.	**Ghana Standard for Drinking Water (GS 175- 2017)** The Ghana Standard specifies the requirements for drinking water obtained from "prepared waters " or "waters defined by origin ". The standard also applies to packaged/bottled drinking water but not packaged/bottled natural mineral water.	The project water requirements are for farming purposes and therefore this standard is not applicable
34.	**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
35.	**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
36.	**Ghana Standards for Health Protection - Requirements for Ambient Noise Control (GS 1222, 2018)** 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	Noise generated at both the construction and operation stages will be monitored as stated in the proposed ESMP to ensure it does not exceed acceptable limits
37.	**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
38.	**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.
39.	**Ghana National Fire Service Act, 1997 (Act 537)**	The project area is prone to bushfires so the Fire Service will

No.	Legal Framework and Key Compliance Requirements	Applicability to Proposed Project
	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.	be engaged to provide education/sensitization on fire prevention and fighting.
40.	**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.
41.	**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.
42.	**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.
43.	**Control and Prevention of Bushfire law, PNDCL 229** 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.	The project area has been designated as an environmentally sensitive area as climatic conditions make it prone to bushfires. Measures have been proposed in this report to deal with fire risks.
44.	**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.
45.	**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.

The roles and responsibilities of the Project Coordinating Unit (PCU), implementing agencies and other stakeholders, legislative and regulatory requirements for the implementation of the ESMP are provided under section 7 of this report.

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.

No.	Institutional Framework and Key Implementation Responsibilities for the project in general and subprojects	Roles and responsibilities in implementing project's ESMP
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; ▪ 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.	SADP must obtain water use permit from WRC and collaborate with the WRC in the protection of water bodies
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 Savelugu Municipality and will be influenced by decisions and plans of the Northern 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	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.

No.	Institutional Framework and Key Implementation Responsibilities for the project in general and subprojects	Roles and responsibilities in implementing project's ESMP
	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.	
6.	**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.
7.	**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 Savelugu Municipality and will be influenced by decisions and plans of the Northern 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
8.	**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 Dagbon Traditional Council that is a key stakeholders 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.

No.	Legal Framework and Key Compliance Requirements	Ratification Date	Applicability to Proposed Project
2.	**Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)** The objective of the Convention is to conserve wildlife and prevent international trade from threatening species with extinction.	14 November 1975	Species such as rosewood, which is listed on CITES, could 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

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. **Table 5-1** describes the environmental and social conditions in these communities. Considering that the environmental and social characteristics are largely homogeneous, broader reference is made to information on the Savelugu Municipality, where the project communities are located.

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

MMDA	POTENTIAL COMMUNITIES	BASELINE ENVIRONMENT
Savelugu Municipality	Nakpanzoo	**Topography**: The landform is generally flat with gentle undulating low relief throughout. **Drainage**: The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District. **Biodiversity**: The area lies in the interior (Guinea) Savanna woodland with vegetation that is drought resistant and hardly shed their leaves completely during the long dry season. Some common fauna are earthworms, dung beetles, cattle, goats, and birds. **Socioeconomic activities**: Farming and trading are the key economic activities. Crops cultivated include rice, groundnuts, yams, cassava, maize, cowpea and sorghum. **Natural disasters**: Events of natural disasters are seasonal in nature with bushfires experienced in the dry season while floods and storms are experienced in the rainy season.
	Gushei	**Topography**: The topography is mostly flat with gentle undulating. **Drainage**: The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District. **Biodiversity**: The vegetation is drought resistant and hardly shed their leaves completely during the long dry season. Notable trees in this locality are shea and dawadawa. Some common fauna are earthworms, dung beetles, cattle, goats, and birds **Socioeconomic activities**: Farming and trading are the key economic activities. Crops cultivated include rice, groundnuts, yams, cassava, maize, cowpea and sorghum.

		Natural disasters Events of natural disasters are seasonal in nature with bushfires experienced in the dry season while floods and storms are experienced in the rainy season.
	Diare	**Topography**: The landform is generally flat with gentle undulating low relief throughout. **Drainage**: The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District There are other waterbodies such as the Oxbow Lake, rivers and streams. **Biodiversity**: The area lies in the interior (Guinea) Savanna woodland with vegetation that is drought resistant and hardly shed their leaves completely during the long dry season. Some common fauna are earthworms, dung beetles, cattle, goats, and birds. **Socioeconomic activities**: Farming and trading are the key economic activities. Crops cultivated include rice, groundnuts, yams, cassava, maize, cowpea and sorghum. **Natural disasters**: Events of natural disasters are seasonal in nature with bushfires experienced in the dry season while floods and storms are experienced in the rainy season.
	Chai Yaoalisi	**Topography**: The topography is mostly flat with gentle undulating. **Drainage**: The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District. **Biodiversity**: The vegetation is drought resistant and hardly shed their leaves completely during the long dry season. Notable trees in this locality are shea and dawadawa. Common fauna are earthworms, dung beetles, cattle, goats, and birds **Socioeconomic activities**: Farming and trading are the key economic activities. Crops cultivated include rice, groundnuts, yams, cassava, maize, cowpea and sorghum. **Natural disasters** Events of natural disasters are seasonal in nature with bushfires experienced in the dry season while floods and storms are experienced in the rainy season.
	Nambagla	**Topography**: The landform is generally flat with gentle undulating low relief throughout. **Drainage**: The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District **Biodiversity**: The area lies in the interior (Guinea) Savanna woodland with vegetation that is drought resistant and hardly shed their leaves completely during the long dry season. Some common fauna are earthworms, dung beetles, cattle, goats, and birds. **Socioeconomic activities**: Farming and trading are the key economic activities. Crops cultivated include rice, groundnuts, yams, cassava, maize, cowpea and sorghum.

		Natural disasters: Events of natural disasters are seasonal in nature with bushfires experienced in the dry season while floods and storms are experienced in the rainy season.
	Pigu	**Topography**: The topography is mostly flat with gentle undulating. **Drainage**: The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District. **Biodiversity**: The vegetation is drought resistant and hardly shed their leaves completely during the long dry season. Notable trees in this locality are shea and dawadawa. Common fauna are earthworms, dung beetles, cattle, goats, and birds **Socioeconomic activities**: Farming and trading are the key economic activities. Crops cultivated include rice, groundnuts, yams, cassava, maize, cowpea and sorghum. **Natural disasters** Events of natural disasters are seasonal in nature with bushfires experienced in the dry season while floods and storms are experienced in the rainy season.
	Nabogu	**Topography**: The landform is generally flat with gentle undulating low relief throughout. **Drainage**: The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District There are other waterbodies such as the Oxbow Lake, rivers and streams. **Biodiversity**: The area lies in the interior (Guinea) Savanna woodland with vegetation that is drought resistant and hardly shed their leaves completely during the long dry season. Some common fauna are earthworms, dung beetles, cattle, goats, and birds. **Socioeconomic activities**: Farming and trading are the key economic activities. Crops cultivated include rice, groundnuts, yams, cassava, maize, cowpea and sorghum. **Natural disasters**: Events of natural disasters are seasonal in nature with bushfires experienced in the dry season while floods and storms are experienced in the rainy season.
	Kukobila Tamaligu	**Topography**: The topography is mostly flat with gentle undulating. **Drainage**: The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District. **Biodiversity**: The vegetation is drought resistant and hardly shed their leaves completely during the long dry season. Notable trees in this locality are shea and dawadawa. Common fauna are earthworms, dung beetles, cattle, goats, and birds **Socioeconomic activities**: Farming and trading are the key economic activities. Crops cultivated include rice, groundnuts, yams, cassava, maize, cowpea and sorghum. **Natural disasters** Events of natural disasters are seasonal in nature with bushfires experienced in the dry season while floods and storms are experienced in the rainy season.

	Zonchacni-Wayayo	**Topography**: The topography is mostly flat with gentle undulating. **Drainage**: The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District. **Biodiversity**: The vegetation is drought resistant and hardly shed their leaves completely during the long dry season. Notable trees in this locality are shea and dawadawa. Common fauna are earthworms, dung beetles, cattle, goats, and birds **Socioeconomic activities**: Farming and trading are the key economic activities. Crops cultivated include rice, groundnuts, yams, cassava, maize, cowpea and sorghum. **Natural disasters** Events of natural disasters are seasonal in nature with bushfires experienced in the dry season while floods and storms are experienced in the rainy season.
	Zosali	**Topography**: The topography is mostly flat with gentle undulating. **Drainage**: The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District. **Biodiversity**: The vegetation is drought resistant and hardly shed their leaves completely during the long dry season. Notable trees in this locality are shea and dawadawa. Common fauna are earthworms, dung beetles, cattle, goats, and birds **Socioeconomic activities**: Farming and trading are the key economic activities. Crops cultivated include rice, groundnuts, yams, cassava, maize, cowpea and sorghum. **Natural disasters** Events of natural disasters are seasonal in nature with bushfires experienced in the dry season while floods and storms are experienced in the rainy season.
	Dinga	**Topography**: The landform is generally flat with gentle undulating low relief throughout. **Drainage**: The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District There are other waterbodies such as the Oxbow Lake, rivers and streams. **Biodiversity**: The area lies in the interior (Guinea) Savanna woodland with vegetation that is drought resistant and hardly shed their leaves completely during the long dry season. Some common fauna are earthworms, dung beetles, cattle, goats, and birds. **Socioeconomic activities**: Farming and trading are the key economic activities. Crops cultivated include rice, groundnuts, yams, cassava, maize, cowpea and sorghum. **Natural disasters**: Events of natural disasters are seasonal in nature with bushfires experienced in the dry season while floods and storms are experienced in the rainy season.

5.1.2 Indirect influence area of the project: Savelugu Municipality

The Savelugu Municipality, with Savelugu as the administrative capital, is located in the Northern Region of Ghana. It was carved out of the Western Dagomba District Council in 1988 under the Local Government Act 462, 1993 by Legislative Instrument (LI) 1450. Nanton District was also subsequently carved out of the then Savelugu Nanton Municipal Assembly changing the name currently to Savelugu Municipal Assembly. The Municipality, covering an area of 1,599 sq. km., is bounded to the north by West Mamprusi Municipal, to the south by Sagnerigu Municipality, to the east by South Karaga and Nanton Districts, and Kumbungu District to the west **(Figure 5-1)**.

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

5.2 Physical Environment

5.2.1 Topography and Drainage

The land in the municipality is generally flat with gentle undulating low relief throughout. The general range of the altitude for the municipality ranges from 400-800 ft. above sea level. The northern part of the municipality has some gentle slopes whiles the southern part is characterised by some slight hills. The area is drained mainly by the White Volta and its tributaries such as the River Kuldanali, which stretches to constitute a natural boundary between the Municipality and Kumbungu District. There are other waterbodies such as the Oxbow Lake, rivers and streams. The effect of the drainage system is felt mostly in the northern part of the Municipality covering the areas between Nabogu and Kukuobilla. These areas are prone to periodic flooding during the wet season, thus making them suitable for rice cultivation.

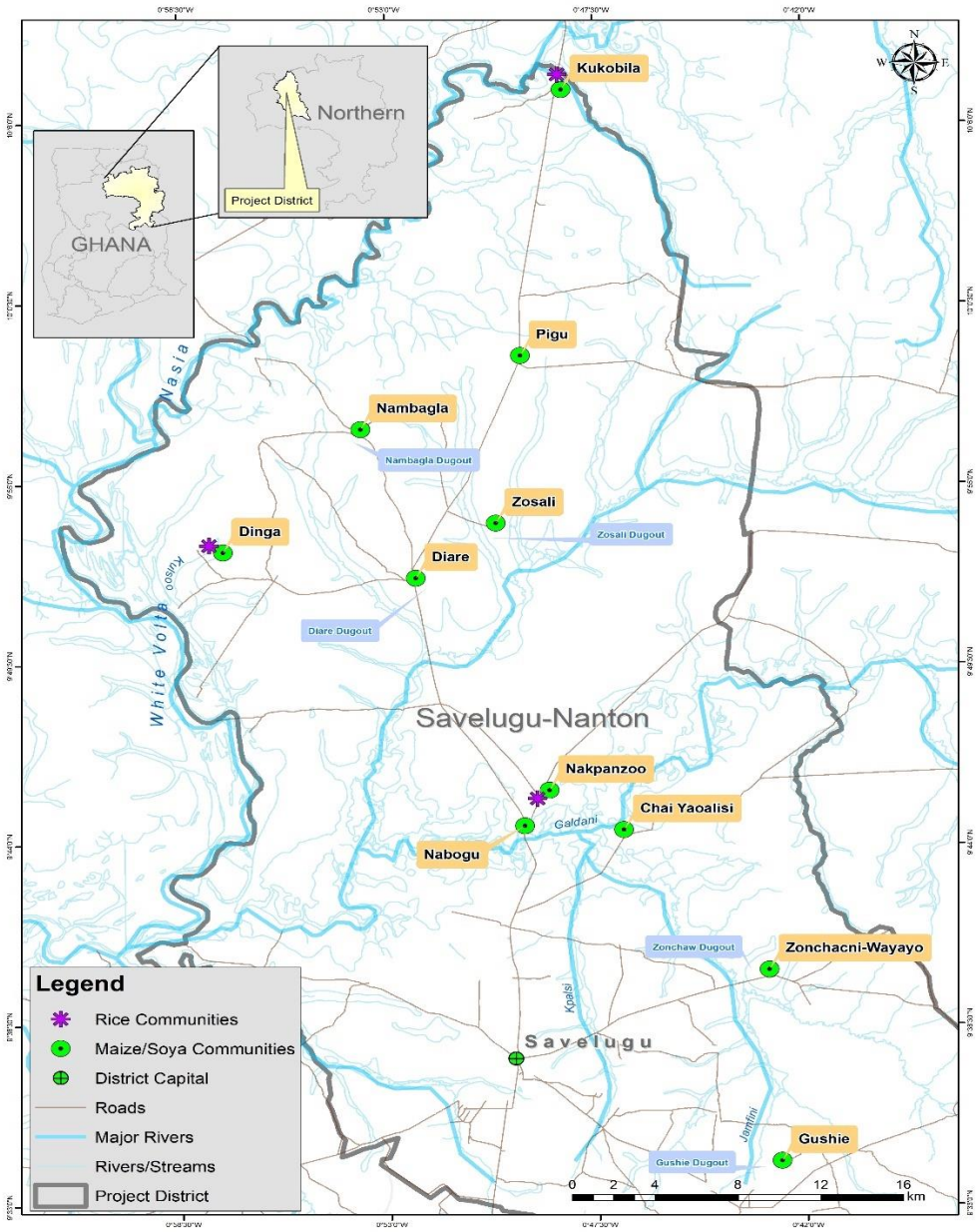

Figure 5- 2: Drainage Map of the Savelugu Municipality

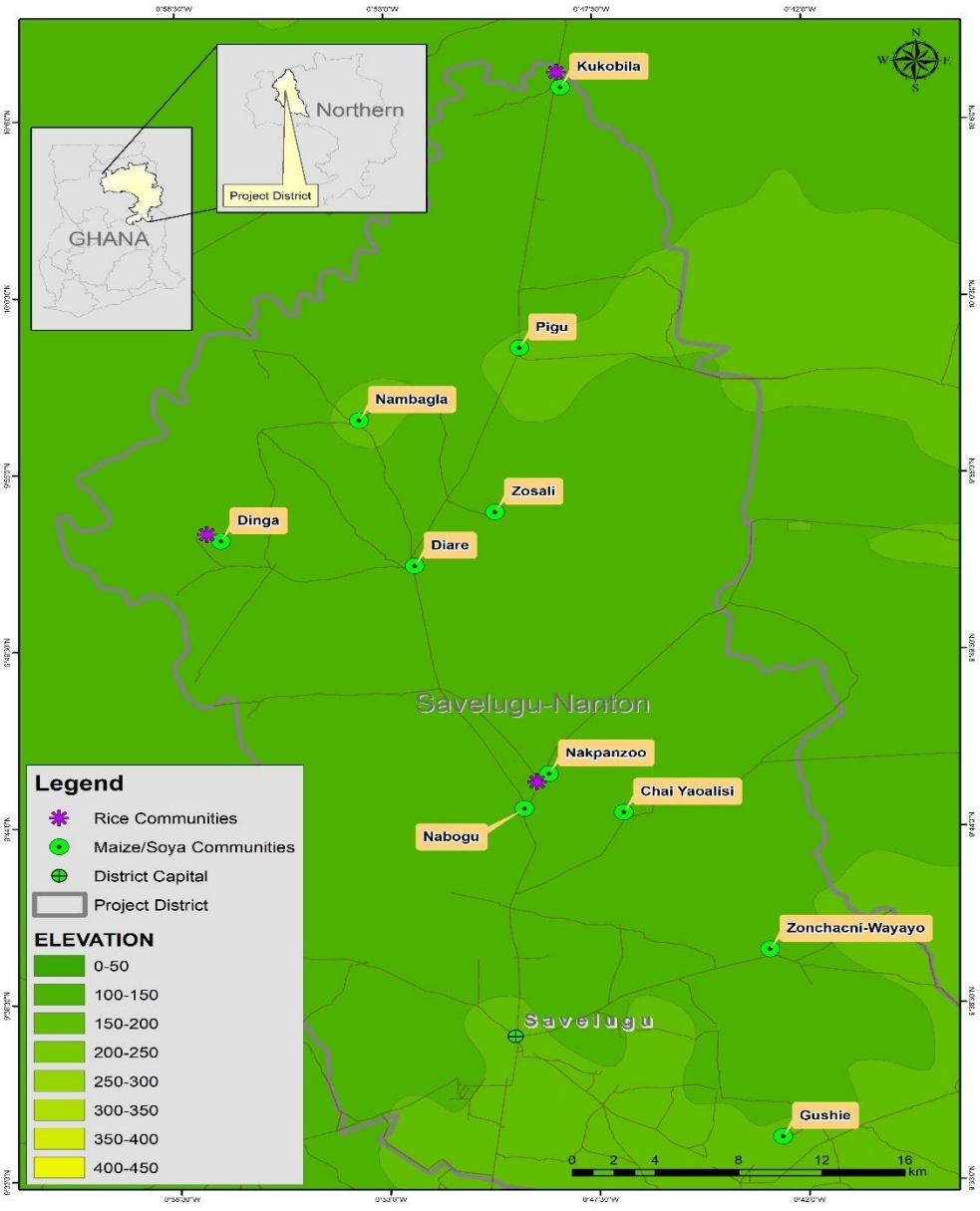

Figure 5- 3: Elevation Map of the Savelugu Municipality

5.2.2 Geology and Soils

The geology of the municipality is of Middle and Upper Voltaian formation. The Upper Voltaian covers the southern part of the Municipality and consists of shale and mudstone. Underground water potential is generally determined by this underlying rock formation, which has varying water potential for underground water compared to the upper Voltaian formation. The middle Voltaian covers the northern part of the Municipality and comprises sandstone, shale and siltstone. Consequently, borehole drilling is expected to have a higher success rate in the northern rather than the southern section.

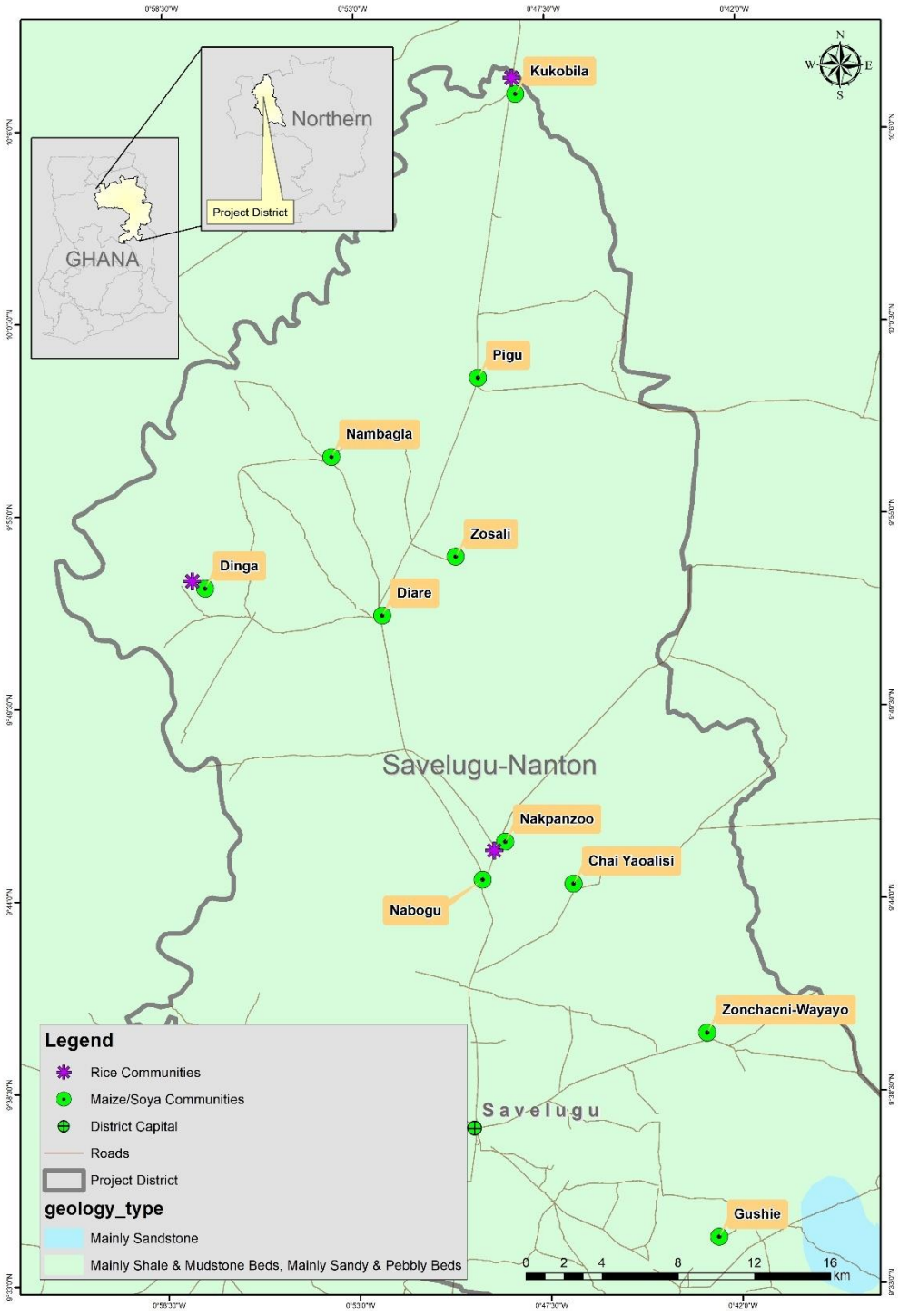

Figure 5- 4: Geology of the Savelugu Municipality

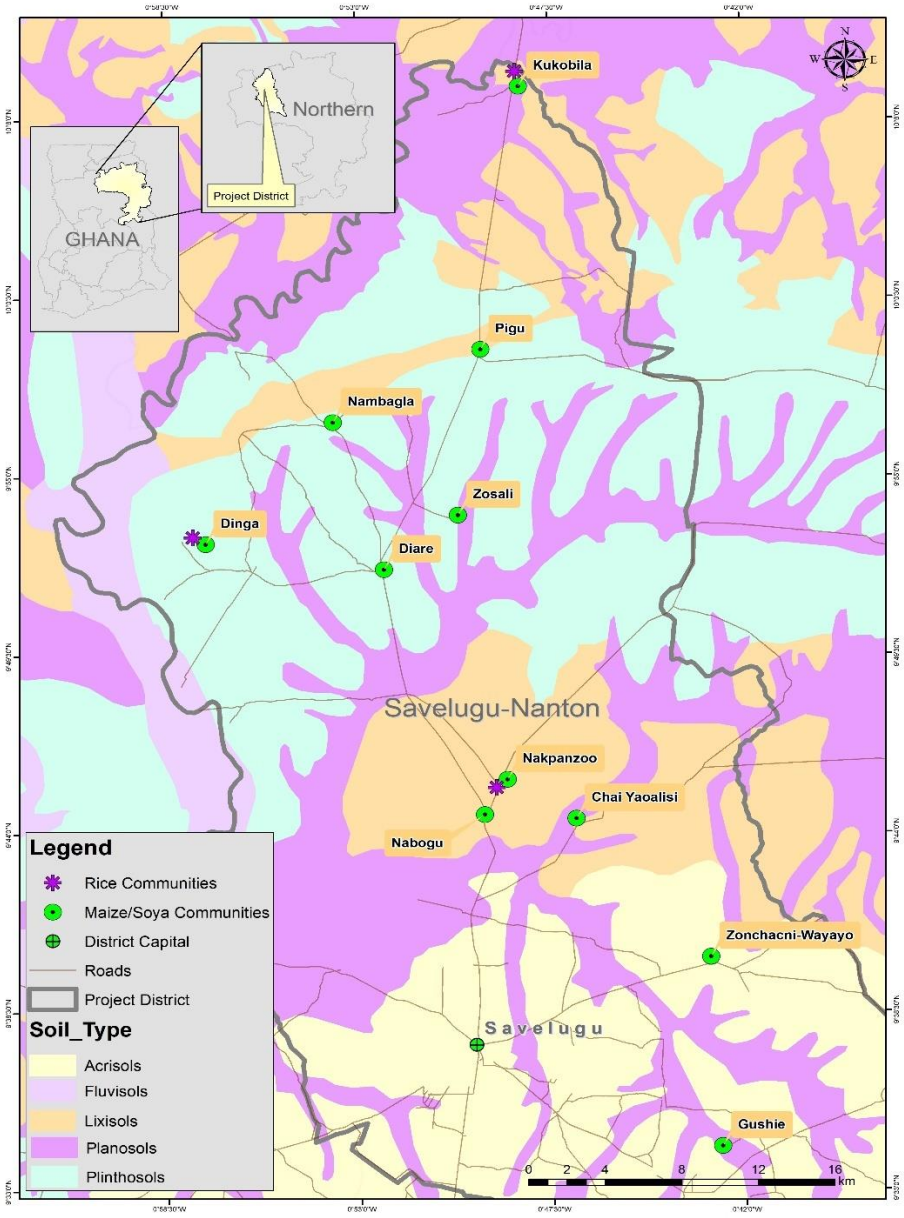

Figure 5- 5: Soil Map of the Savelugu Municipality

5.2.3 Climate

The area experiences a dry and rainy with an average rainfall of 600mm. The season is ushered in by erratic rainfall in April with increased intensity as the season continues with the average rising from 600mm to 1000mm. The mean temperature of the district ranges from 42°C to 16°C, with an average temperature of 34°C. The generally high temperatures as well as the low humidity brought about by the dry harmattan winds favour high rates of evaporation and transpiration, leading to water deficiencies.

5.2.4 Environmental Quality

The Nakpanzoo community was chosen for environmental quality assessment out of the eleven (11) potential communities because it has the largest land area suitable for cultivation.

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 $\mu g/m^3$.

The Particulate Matter ($PM_{2.5}$ and PM_{10}) concentrations monitored at Nakpanzoo Community were 19 $\mu g/m^3$ and 45 $\mu g/m^3$ which are 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.

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 (54.5dBA) was below the GSA and IFC L_{EQ} guideline values of 60 and 55 respectively. The nighttime ambient noise level (dBA) for the project site (47.9dBA) was also below the GSA and IFC L_{EQ} guideline values of 55Dba **(Annex 6)**.

Surface water quality

Water testing was done at the nearest water sources, Kpanlsi Stream and a borehole, in the community. The community relies mainly on the Kpanlsi for drinking, washing and farming.

The water sources which could potentially be recipients of any pollution impact from the project were tested on the, 17th January 2022 at 11:15am and 11:37am respectively. Parameters including Temperature, pH, TDS and Conductivity were measured in-situ using a field kit, Thermo Scientific EUTECH Handheld Meter Kit. Parameters analyzed were within the WHO and GS 175:2017 5th drinking water guidelines, showing that the quality of the Nakpanzoo stream is generally good with pH of 6.45, conductivity, 83.30 µS/cm, and TDS of 44.83. **(Annex 6)**.

5.3 Biological Environment

5.3.1 Vegetation

The area lies in the interior (Guinea) Savanna woodland with vegetation that is drought resistant and hardly shed their leaves completely during the long dry season. The northern part of the municipality which is sparsely populated has denser vegetation mostly with secondary forest and the populous south on the other hand, is depleted by human activities such as farming, bush burning and tree felling among others. Notable trees are shea trees, (the nuts which are used for making sheabutter) and dawadawa that provides seeds used for condimental purpose. Most of these are of economic value and serve as important means of livelihood especially for women. The area is suitable for large-scale livestock farming, as well as the cultivation of staples like rice, groundnuts, yams, cassava, maize, cowpea and sorghum.

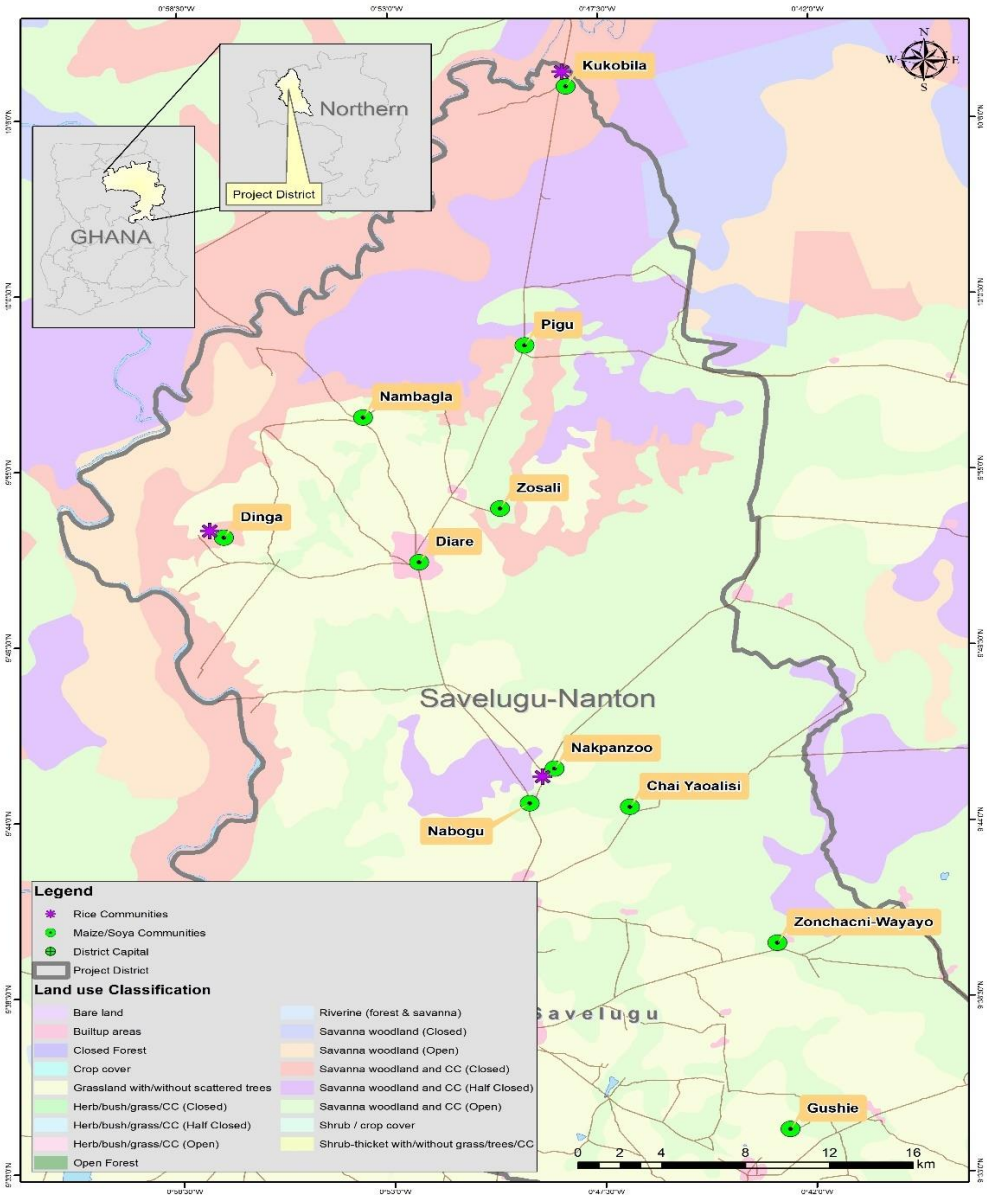

Figure 5- 7: Land Use Map of the Savelugu Municipality

5.4 Socio-Economic Environment

5.4.1 Governance Structure

The main administrative structure in the district is the District Assembly headed by the District Chief Executive. In order to improve the decentralization, aim of the country the municipality has 22 decentralized departments to handle various issues in the district, there are other approved governance structures in the district that seek to assist with the governance and planning within the district. These groups include traditional authorities, youth associations, religious bodies and development partners. The district has 4 sub governance structures known as the zonal councils. They are the Savelugu, Pong Tamale, Diare and Moglaa Zonal councils. The highest decision body; the general assembly in the district is made up of 36 elected persons, 16 appointed persons, 2 members of parliament and the municipal chief executive.

5.4.2 Demography

The population of the Municipality, according to the 2021 Population and Housing Census, is 122,888 comprising 60,390 (49.1%) males and 62,498 (50.9%) females. With a growth rate of 3%, the population of the Municipality is 130,825 in 2021. The population growth in absolute terms within the medium-term period (2010 to 2017) is 11%. Females constitute 51.5% of the population and males 48.5%. This indicates a sex ratio of 94.1 males per 100 females. The population density in 2010 was 78 persons per sq. km and in 2025 it is expected to be 93 Persons per sq. km.

Majority (62.9%) of the population live in urban areas with 37.1% living in rural areas. Three out of every five persons in the municipal live in the rural communities (60.3%). Out of the total population, about (43.5%) falls within age groups 0-14 years; age group 15-39 has (41.1%), 40-64 years (9.4%) while about six (6%) per cent of the total population is 65 years and over.
The working age group (19-60 years) accounts for 50.5% of the population and the dependency age group account for 55% of the population. The aged is about 6% of the population of the Municipality, whiles the school age group account for 52% of the population. 60.3% (94,702) of the Municipality's population live in rural areas.

The population of the municipality is 122,888 comprising 60,390 (49.1%) males and 62,498 (50.9%) females. This is about 5.3 % and 0.4% of the regional and national population respectively. The population density is 76.9 persons per sqkm with a total of 23,085 households and an average household size of 5.2 persons per household which is equal to the regional average. Majority (62.9%) of the population live in urban areas with 37.1% living in rural areas.

Compound houses are the common (74.4%) type of dwelling units occupied by households in the municipality followed by huts/buildings/houses (same compound) (14.8%) and separate houses (7.1%). Compound houses are common type of housing units occupied by household in both urban and rural areas. Higher proportions of both male (75.4%) and female (74.3%) live in compound houses.

Ethnically, the municipality is predominantly Dagombas (88.4%) and Frafra (<1.0%). The other ethnic groups are Mamprusis, Ewes and Gonjas. Islam is the dominant religion, representing (95.4%) followed by Christianity and other religions.

5.4.3 Education and Literacy

The municipality has a high level of illiteracy with 69.2% of the population 11 years and older incapable of reading or writing in any language. In terms of sex, approximately 78.5% of females 11 years and older cannot read or write with that of males constituting 59.1% (Ghana Statistical Service, 2010 Population and Housing Census). Thus 7 out of every 10 females in the municipality cannot read and write.

For the literate population, those who are literate in English and Ghanaian language constitute 65.7% whiles those who are literate in English only form 27.7%. Also, more males (68.1%) are literate in English and Ghanaian language compared to 61.6% of females. For the age groups, more than 50.0% of the population from all ages could read and write in English and Ghanaian language.

The Municipality is zoned into six educational circuits for administrative purposes namely Savelugu East, Savelugu West, Diare North, Diare South, Pong-Tamale and Moglaa. There are two Senior High Schools located at Savelugu and Pong-Tamale. There is also a school for the deaf, a Veterinary college and two Vocational schools located in Savelugu and Pong-Tamale. There is also a Girls Model JHS. There are 95 Early Childhood Development Centers [Kindergartens] 66 Primary Schools and 34 JHS.

Among the population 3 years and older, 59.2% have never attended school, 8.4 % have attended in the past and 32.5% are currently attending school. In terms of sex distribution, 50.7% of males and 67.0% of females three years and older in the district have never attended school. There are currently more males in school than females, with 38.1% of males in school whiles only 27.2% of females in the school (Medium Term Development Plan for Savelugu Municipality, 2022-2025).

5.4.4 Economic Activities

Agriculture is the mainstay of the people employing 74.1% in the areas of skilled agriculture, forestry and fishery works. Crop farming dominates (97.0%) the types of agricultural activities engaged in followed by livestock farming (68.7%). Other employment avenues include, elementary occupation, craft and related trades, and service and sales work.

There are limited industrial activities with agro-processing constituting the main industrial activities i.e. sheanut processing, groundnuts processing, cotton ginnery, and rice processing. Apart from Shebu Industry that uses modern technology to process sheanut on a large scale for export, traditional small-scale methods dominate agro processing in the municipality. These small-scale activities are a major employer of women.

There are a number of tourism potentials in the municipality among which include the Saakpuli Slave Market, Tuunaayili, the former seat of the Dagomba Kingdom, Yoggu, which is said to be where the chief

priest settled long ago and an Oxbow Lake at Zonchangni. However, these are yet to be fully exploited for economic gains.

5.4.5 Utilities and Services

Energy

The main source of energy for lighting is electricity with 42.0% of dwelling units connected to the national grid. This is followed by kerosene lamp (37.8%), flashlights/torch (17.3%), generator (1.0%) and others. Fuelwood and charcoal are the main sources of cooking fuel by 96.2% of households. The use of wood as cooking fuel is high in both urban (83.2%) and rural (93.2%) localities. Higher proportion of urban household use charcoal (12.0%) and gas (1.9%) as compare to the rural households which depend less on gas (0.9%) and charcoal (3.6%).

Water

Some (39.6%) of the households in the municipality use water from bore (holes/pump/tube well) while 18.6 % depend on (public tap/stand pipe). The use of (dugout/pond/lake/dam/canal) for drinking is relatively high accounting for 13.2%, there are wide variations in the main source of drinking water between urban and rural localities. Whiles (Public tap/stand pipe) accounts for 34.9 % as the main source of water in urban areas, (bole holes/pump/tube well) accounts for 54.9% in rural areas.

The proportion of urban dwelling units that use pipe-borne water as the main source of drinking water is 51.4% compared with 13.4% in rural localities. Households that use (borehole/pump/tube/well) as main source of water for domestic purposes accounts for 37.2 %, while those who use (Public tap/stand pipe) and pipes born outside dwelling account for 14.9% and 7.0% respectively. The (public tap/stand pipe) is the prevalent source of water for other domestic purposes in the urban areas (26.9%) while the rural areas depend mainly on water from borehole/pump/tube well (50.8%).

Sanitation and Waste Management

The sanitation and waste management situation is poor as 67.2% of the households have no toilet facility thereby resorting to open defecation. The percentage of households which use the public toilet (WC/KVIP/pit pan) constitute 19.5%. About 59.5% of urban households and 72.5% of the rural households have no toilet facilities. About 32.3% of the urban households use public toilet (WC/KVIP/pit pan), while in the rural areas, 10.9% households use the KVIP.

Seven in ten (71.3%) of households in the district dispose of liquid waste onto the street/outside dwelling, 6.0% dispose of liquid waste through drainage into a pit (soak away), a little more than 1.0% use the sewerage system. Majority of households in both urban (74.3%) and rural (69.2%) localities dispose of their liquid waste onto the street/outside dwelling although this practice is a little more prevalent in the urban areas than in rural areas.

The dominant method of solid waste disposal in the district is the public dump (49.8%). Almost one in five of households dump their solid waste indiscriminately. Whiles 27.7% of households in urban areas dump solid waste in designated public dump container, only 6.0% of rural households dump solid waste in public

containers. Indiscriminate dumping of solid waste is more prevalent in the rural localities, (26.4%) than in the urban localities (15.4%).

Communication

Mobile phones are owned and used by some 25.3% of persons 12 years and older for communication. A considerably higher proportion of males (35.8%) than females (16.0%) own mobile phones. On computer ownership, only 1.6% of the total households have desktop or laptop computers with 1.8% using internet services. The low level of ICT use in the municipality could be attributed to the low level of literacy and educational attainment.

5.4.6 Health

The municipality has one (1) hospital at Savelugu, four (4) health centres at Savelugu, Pong Tamale, Moglaa and Diare, two (2) private clinics at Savelugu (Nasara & Modern Surgical) and Twelve (12) operational CHPS zones, Seven (7) CHPS compounds at Dipali, Pigu, Kuldanaali, Bunglung, Nambagla, Yong and Kukobilla. The major diseases found in the district include Malaria, Upper Respiratory Tract Infection, Diarrhea, Rheumatism/joint pain, Typhoid Fever, Hypertension, Anemia Skin Diseases and Pneumonia.

5.4.7 Transportation

Except a few communities especially the settler farmer communities, majority of the communities are interconnected with feeder roads. However, over 50% of the roads are seasonally unmotorable. The efficient road transport is along the Tamale-Bolgatanga trunk road and there are vehicle services to about 80% of rural communities in the municipality where the bulk of the food crops are produced.

5.4.8 Land Ownership/Tenure

Allodial title is held or vested in traditional stools or skins, in some traditional areas. In other traditional areas, this is held by subgroups such as sub stools, clans and families as well as individuals. Allodial owners hold their interest under customary law and are not subject to any restrictions on their use rights or any obligations except for those imposed by the law (statutory law).

The land tenure system, which is predominantly customary, operates under the patrilineal mode of property inheritance. Although this system has recorded considerable changes with regards to land transfer due to population pressures, urbanization, commercial agriculture, and legislative interventions, it remains male inclined. It thus excludes women from ownership and limit access rights by inheritance. In most cases, women in the district rely on “borrowed lands” for use which is granted based on their status to males as relatives- daughters, sisters, or wives. This short-term interest can be terminated at any time by the owner, hence exposing women to tenure insecurity.

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 11 potential beneficiary communities which were selected based on their proximity to vast agricultural land and existing commercial farms or agricultural establishments.

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. 6 and 7. The dry climatic conditions make the area fire prone. Also, low-lying areas are prone to flooding during the wet season (**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;
- Environmental Protection Agency;
- Regional Coordinating Council;
- Metropolitan 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
- Save the Government of Ghana from importing poultry products as well as cereals and thereby save foreign exchange for Ghana
- Availability of poultry waste which can be used as organic manure on the maize and cereal farms

6.7.1 Creation of job opportunities

Job opportunities for skilled, semi-skilled and unskilled labour will be created at the construction and operation phases as locals, including women, will be recruited for short-term and long-term jobs.

During construction of various agricultural value chain support infrastructure (assembly/construction of semi-industrial units, construction of warehouses, hatcheries etc.), labourers and piece workers will be engaged. The presence of workers will create an opportunity for food vendors, shop owners and other

business operators in the communities to make some income. At the operation phase, there will be increase in the number of agricultural jobs leading to income generation and poverty reduction.

6.7.2 Increased commerce and boost to local economy

Agricultural productivity will increase quantitatively due to increased access to mechanization services by crop and poultry farmers. This will result in higher revenue for players within the value chain such as farmers, input suppliers, transport operators, feed millers etc. Also, the project will improve and facilitate establishment of local services for marketing, processing, quality control services and development of new investment opportunities.

6.7.3 Food security and risk reduction

Increase in production capacity coupled with availability of storage facilities will make produce available all year round and improve reliance on local agricultural produce. This will reduce the importation of agricultural produce across borders and improve food security.

6.7.4 Adoption of good agricultural practices

The proposed project will involve the community and the local stakeholders throughout the project cycle equipping them with knowledge and skills in agricultural practices. The project will present the local stakeholders with a learning opportunity on good practices, such as climate smart agriculture, efficient water management, fertilizer application, among others leading to reduction in losses and better pest and disease management.

6.7.5 Technology transfer

Farmers will be exposed to new technologies for geomapping, crop and poultry management, pest and disease control, processing etc. that were otherwise not known to them. For instance, applications such as the RiceAdvice decision support; will provide farmers guidelines for specific field conditions via smart phones. For pest and disease control, technologies that counter threats from parasitic striga, health-threatening aflatoxins and the invasion by Fall Army Worm will be made available to farmers. Facilitation of farmer access to mechanical and motorized shellers, threshers, improved seed variety and breeds, modern incubation and hatcheries, mechanized plucking and veterinary support will all increase productivity of farmers and increase their savings.

6.7.6 Availability of poultry waste which can be used as organic manure on the maize and cereal farms

Increased production in the poultry sector can help address the challenge of limited access to inorganic fertilizer. Farmers can use their poultry waste to create organic manure, which is environmentally friendly, in appreciable quantities to be distributed amongst farmers within the district to augment the distribution of inorganic fertilizers within 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 by farmers without following due process could result in land-related disputes
- **Impact on livelihoods -** The project activities could restrict locals access to lands that were otherwise used as pasture areas. There could also be loss of economic trees such as shea and dawadawa which provides a livelihood for some locals especially women who pick and sell them.
- **Destruction of vegetation -** Site clearing will lead to the destruction of some common vegetation and a few trees.
- **Flooding -** The project implementation could be adversely affected by events of flood from torrential rainfall in the wet season especially in low-lying areas affecting properties and lives.

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 and affect flora and soil fauna
- **Air pollution –** Levelling of land and 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
- **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 benthic organisms.
- **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.
- **Occupational health and safety –** 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 could affect their health or lead to indiscriminate defecation.
- **Traffic management -** 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 will adversely affect the health of users**. S**exual 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 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 and fumes.
- **Pollution of Soils and Water –** Wastes, workforce sewage effluent, as well as runoff from cultivated land (containing fertilizers, pesticides and herbicides etc.) could pollute surface water, reduce its quality and make it unsuitable for use
- **Odours -** Odours associated with poultry and waste may have nuisance value for nearby receptors.
- **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
- **Waste generation and disposal -** 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.
- **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.
- **Occupational health and safety -** 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.
- **Traffic management -** 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
- **Snake bite risks –** Women and any other persons picking dawadawa and shea fruits could be exposed to snakebites resulting in hospitalization or fatality.
- **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 Savelugu Municipality

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 • Loss of economic trees (Shea, Dawadawa, etc • 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) • Snake bites from picking shea • Waste generation (including solid, liquid and hazardous waste) • Elite capture
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 and loss of economic trees	The project activities could restrict locals access to lands that were otherwise used as pasture areas. There could also be loss of economic trees such as shea and dawadawa which provides a livelihood for some locals especially women who pick and sell them.	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. • Encourage locals to practice the cut and carry system • Consider employing local women as part of project implementation • Build capacity of women to own and run businesses that will provide services to the project. • Prepare a RAP to assess impact on livelihood

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
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.
Environmental and social assessment	Flooding	The project implementation could be adversely affected by events of flood from torrential rainfall in the wet season especially in low-lying areas affecting properties and lives.	Regional	Temporary	Strong	Moderate	• Educate workers and community on early warning signs of flood • Discourage the siting of farms within or close to river beds • Collaborate with spatial planning and disaster management agencies, using disaster maps and systems, to stay away from flood-prone areas • Infrastructure for agricultural establishments should be constructed preferably on high grounds • Provide insurance cover for equipment and personnel

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 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.

Impact on livelihoods

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.

Project activities such as land clearing could destroy some economic trees like dawadawa and shea. Women are known to pick fruits of these wild trees and sell as a means of livelihood. Since these trees grow in the wild, picking can be done in other areas.

The impact is local, and the displacement will be temporary as alternative sites exist. The impact is therefore considered 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. Herdsmen can practice the cut and carry system i.e. grass is cut and carried to feed animals to avoid any potential conflicts over access. Women earning a living out of shea and dawadawa picking should be considered for employment both during construction and operation phases of the project. It is recommended that the capacity of women is built so they can own and run small and medium scale enterprises that will provide services to the project and the community at large. Also, preparation of a detailed RAP will be required to fully assess the impact on livelihood.

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 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.

Flooding

The project area is a known flood-prone area with inundation mainly from the White Volta and its tributaries (Galdani, Jamfini, Zonchaw, and Kulsoo), that run through the beneficiary communities, overflowing their banks. The proximity of project communities (between 0.2km and 1km) to these water bodies, coupled with the annual (August/September) spillage of water from the Bagre Dam in Burkina Faso, presents a high probability of project sites getting flooded. Flood events could lead to disruption of livelihood activities, loss of property and even lives. Also, supply chains could be disrupted by loss of infrastructure such as bridges in flood events. This impact is regional, severe yet temporary hence considered major.

Flood events have the potential of disrupting the implementation of the project in the municipality unless farmers are discouraged from siting their farms within or close to river beds. Other mitigation measures include collaboration with spatial planning and disaster management agencies, using disaster maps and systems to stay away from flood-prone areas. Infrastructure for agricultural establishments should be constructed preferably on higher grounds or an artificial elevation. Workers and the community must be educated on early warning signs of flood and insurance cover provided for equipment and personnel.

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 dust from transport of materials especially on untarred routes to project site. Emission of fumes from poorly maintained vehicles and equipment	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. • Service vehicles and equipment regularly

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
	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 • 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.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• 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.
	Waste generation and disposal	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,	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
		generation of wastes/emissions, pollution of soils and water.					
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.	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.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• 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
	Traffic impact	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. • Have checklists available to manage vehicle and equipment maintenance and management

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• 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
	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

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• 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
	Public health issues	Pollution of local water bodies will adversely affect the health of users	Local	Temporary	Average	Moderate	• Ensure proper waste management •

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
		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.
	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	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

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
		Potential conflict over sexual affairs, child labour, drunk driving, accidents and destruction of property.					

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 vegetated at all times to prevent wind 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 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 that drain the area such as the Kpalsini, Klubon, Juni, Yelbonni are only between 0.8km and 4km away from project communities and could be the direct recipient or indirect recipient of pollutants from its tributaries. The extent of the impact could be regional over a limited duration and cumulative in nature 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. 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, reduce its quality and make 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.

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 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

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 such as lack of welfare facilities, restriction of freedom of association and speech as well as lack of an effective grievance redress mechanism. If the necessary actions are not put in place to guarantee workers right and stipulate conditions of service to ensure that proper working conditions are implemented on the project. 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 contracted 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.

Traffic management

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 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 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.

Snake bite risks

Women and any other persons collecting dawadawa and shea fruits are likely to be exposed to snake bites as the project region i.e. Upper West region is known to have high cases of snake bites. Impacts of this risk include reduction in productivity of victims who skip work to seek treatment, prolonged illness or premature death due to unavailability or high cost of anti-snake venom (USD 100 per vial). Considering that victims require 3 to 8 vials, health facilities may not have adequate supplies, and victims may resort either to traditional medicine (that may be ineffective) or they will not seek treatment at all. This impact

is localised, temporary and average in intensity as it can lead to hospitalization and even death. It is therefore considered moderate in significance.

Pickers should be provided with picker tools and PPE such as wellington boots either for free or at a subsidised price to prevent them from picking with their bare hands and reduce their exposure to bites. Project to identify a local health facility with regular supply and adequate stock of vials and designate as a referral facility for snake bites. Locals should be sensitized on the importance of avoiding snakes and seeking early medical help after snake bites.

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.

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 sheet 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
	Pollution of Soils and Water	Pollution of watercourses caused by wastes of workforce, sewage effluent, as well as runoff from land used for growing maize (containing fertilisers, pesticides and herbicides etc.).	Local	Temporary	Average	Moderate	• Prepare and implement a Pesticides Management Plan • Treat waste at source before discharge
	Odours	Odours associated with poultry and waste may have nuisance value for nearby receptors.	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. • 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.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• 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. • 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.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• 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.
	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

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							authorities) and operation (local authorities).
Labour conditions, health and safety	Occupational health and safety	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. • 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.	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.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• Encourage frequent breaks and job-rotation to reduce impact of the weather on workers.
	Traffic impact	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 trucks could lead to road accidents and traffic congestion especially on busy roads.	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 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

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• 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 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	• 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

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• 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
	Public health issues	Pollution of local water bodies will adversely affect the health of users	Local	Temporary	Weak	Minor	• Treat waste as source • Prepare Pest Management Plan

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
		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. Incidence of outbreak of H1N1 virus from poultry to humans	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. • 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.
		Snake bite risks	Local	Temporary	Average	Moderate	• Provide pickers with picker tools and PPE at subsidized rate to reduce exposure to bites • Identify a local health facility with regular supply and adequate stock of vials and designate as a referral facility for snake bites.

AfDB OS and Ghana EPA Legislation	Potential Impact	Sources of Impact	Extent	Duration	Intensity	Severity	Mitigation
							• Sensitize locals on the importance of avoiding snakes and seeking early medical help after snake bites
	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. • 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

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 and loss of economic trees	Preparatory	• 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. • Encourage locals to practice the cut and carry system • Consider employing local women as part of project implementation • Build capacity of women to own and run businesses that will provide services to the project. • Prepare a RAP to assess impact on livelihood	PCU	Environmental and Social Safeguards Specialists of PCU	5,000
Destruction of vegetation and displacement of wildlife	Preparatory	• 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
Flooding	Preparatory	• Site preparation	• Avoid	• Educate workers and community on early warning signs of flood • Discourage the siting of farms within or close to river beds • Collaborate with spatial planning and disaster management agencies, using disaster maps and systems, to stay away from flood-prone areas	PCU	Environmental and Social Safeguards Specialists of PCU	5,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Infrastructure for agricultural establishments should be constructed preferably on high grounds • Provide insurance cover for equipment and personnel			
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. • Ensure the use of nose mask in dusty environment. • Service vehicles and equipment regularly	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. • Ensure proper waste management	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	Works contractor	Environmental Safeguards Specialist of PCU	5,000

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 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.			
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.	Works contractor	Environmental Safeguards Specialist of PCU	20,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Have accident and incident reporting form available to record accidents and near-misses			
Poor labour working conditions	Construction	• Project 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.	Works contractor	Environmental and Social Safeguards Specialists of PCU	10,000
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 be placed beside road facing oncoming traffic and a similar “End” sign after work area.	Works contractor	Environmental and Social Safeguards Specialists of PCU	8,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• 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
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	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
						Specialists of PCU	
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
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.	Facility manager	EPA, Agric Department,	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• 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.		District Assembly EHU	
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 and implement a Pesticides Management Plan • Treat waste at source before discharge	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. • 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.	Facility manager	EPA, Agric Department, District Assembly EHU	8,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• 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 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	Facility manager	EPA, District Assembly EHU	8,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• 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 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

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
Snake bite risks	Operation	• Project community interactions	• Avoid or reduce at source	• Provide pickers with picker tools and PPE at subsidized rate to reduce exposure to bites • Identify a local health facility with regular supply and adequate stock of vials and designate as a referral facility for snake bites. • Sensitize locals on the importance of avoiding snakes and seeking early medical help after snake bites	PCU	Environmental and Social Safeguards Specialist	5,000
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	• 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	Facility manager	EPA, District Social Welfare Department	10,000

Impact	Project Phase	Source	Mitigation Hierarchy	Mitigation Measure	Responsible Party	Monitoring	Cost (USD)
				• Display on site posters prohibiting sexual exploitation and harassment			
TOTAL COST OF ESMP IMPLEMENTATION							**266,000**

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 ESMF 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
Savelugu 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, Savelugu Municipal Assembly (SaMA), 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, SaMA 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
	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	• 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)
		• Cleanliness of site/housekeeping • Odour • Presence of human waste on site • Complaints by workers/residents				
	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 • 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	• 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)
		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
	Waste generation and disposal	• Presence of toilets and number dustbins provided on site • Number of times waste is lifted in a week • Cleanliness of site/housekeeping • Odour	• 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)
		• Presence of human waste on site • Complaints by workers/residents				
	Traffic management/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

No.	Potential Environmental and Social Impacts	Monitoring Parameters/Means of verification	Monitoring Site	Frequency	Responsibility (Implementation/ Monitoring)	Cost Estimate/ Year (USD)
	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 Municipal 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;
- Municipal 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 Metropolitan 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	17/11/2021	Savelugu	3	0
	Project Coordinating Unit	18/11/2021	Tamale	2	0
Regulatory Institution	Environmental Protection Agency	21/06/2022	Tamale	1	1
	Fire Service	20/11/2021	Savelugu	3	1
Other Government Institutions	Lands Commission				
	Regional Coordinating Council				
	Savelugu Municipal Assembly	23/11/2021	Savelugu	3	1
	National Disaster Management Organization	23/11/2021	Savelugu	3	0
	Rural Enterprises Project				

Group of stakeholders	Stakeholders	Date of consultation	Location of consultation	Total number of persons met	Total women met
Other stakeholders	Commercial Farmers	22/11/2021	Savelugu	4	0
	Suppliers	20/11/2021	Savelugu	2	0
	FBOs/FBGs	19/11/2021	Savelugu	5	0
	NGOs				
	Farmers	22/11/2021	Sawaba	4	0
		22/11/2021	Nakpanzoo	6	0
		23/11/2021	Diare	7	2
		23/11/2021	Gushie	5	0
	Women's Group	23/11/2021	Tindang	20	20

10.3 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.

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 monitoring

- Soil tests should be conducted for suitability of soils before project implementation
- Competent technical staff should be employed to ensure smooth implementation
- Adequate funds should be should be provided to facilitate the implementation of project activities
- Periodic and regular monitoring should be conducted on the project to facilitate the implementation of project activities.
- Ensure project cycles/phases run according to schedule

Coordination and cooperation

- The District Assembly and other institutions like Lands Commission, Fire Service etc. should be involved in project implementation and provided resources, where necessary

- In particular, there should be institutional collaboration to prevent invasion of pests such as Fall Army Worm
- Adequate funds should be should be provided to facilitate the implementation of project activities

Sensitization

- Farmers should be sensitized on the project to enable them to fully participate in the project.
- Community members should be adequately engaged and informed of project as some have no idea of the project
- Assembly officers and the beneficiary community leadership should be well sensitized on the project to ensure smooth implementation

Marketing and Pricing

- More feed mills must be made available, if necessary, by the project to process produce into food.
- Standard weights and prices of goods should be used as some middle men employ inappropriate means in pricing goods. A consensus should be arrived in obtaining a fixed value for produce.
- There is difficulty in obtaining a good market for produce in addition to a lack of standard prices for goods.

Socio-economic issues

- Activities of Fulani herdsmen must be checked or projects should be sited away from area known to have Fulani herdsmen
- The livelihood of the beneficiaries should be positively impacted by the project.
- The standard of living in the community is low. The community's life is made positive by the availability of land for farming and livestock production. The employment of good farming practices, provision of good quality seeds, adequate farm machinery like harvesters and processes etc. would provide a better-quality life for the community.
- There has to be proper documentation in the process of land acquisition.

Environmental issues and natural disasters

- Flooding is a major disaster that hits the municipality annually, especially when the Bagre Dam in Burkina Faso spills excess water. Measures should be put in place to mitigate its adverse effects
- To cater for natural disasters such as drought and flooding, there is the need for the project to provide insurance for crops
- In order to effectively protect available water bodies, farming around water bodies should be avoided.

- Fire belts should be created around project sites to prevent the occurrence of fires and limit damages.
- Locals should be trained to serve as fire volunteers to support the efforts of the Fire Service in the event of fire within communities

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 reduced for suppliers.

Provision of farm inputs and machinery

- The project should provide farm inputs like viable seeds and procure adequate machinery to facilitate production.
- The project should supply adequate farm machinery soya bean processing machines, and combined harvesters to facilitate production of produce and also complimenting the inadequate labor in the community.
- The community has challenges with procurement of farm machinery and inputs such as tractors, combined harvesters, and feed for livestock and poultry.

Community leadership and governance

- Communities appoint elders/leaders through succession and by community appointment. Untrustworthy people, people with specific ailments, and those who are under the age limit are all prohibited from being elders/leaders.
- Chief and elders, religious leaders, youth groups and opinion leaders are among the key decision-makers. The assembly member serves as government representative, of which the community is satisfied with their representation.

Land ownership, right and access

- Majority of lands are stool lands and can be accessed through a request from the traditional authorities. There are squatters in the area who may be affected by the land acquisition.
- There have been no land-related conflicts in the community.

Vulnerable groups

- There are some women-headed households within the community.
- There are vulnerable people who may be poor or have limited access to land. There are disabled persons in the community.

Community needs/priorities

- Healthcare, potable water, and Farm machinery are pressing needs of local communities.

The community has challenges with changes in rainfall pattern, capital acquisition for agriculture and depletion of soil fertility.
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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 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 (11 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.

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

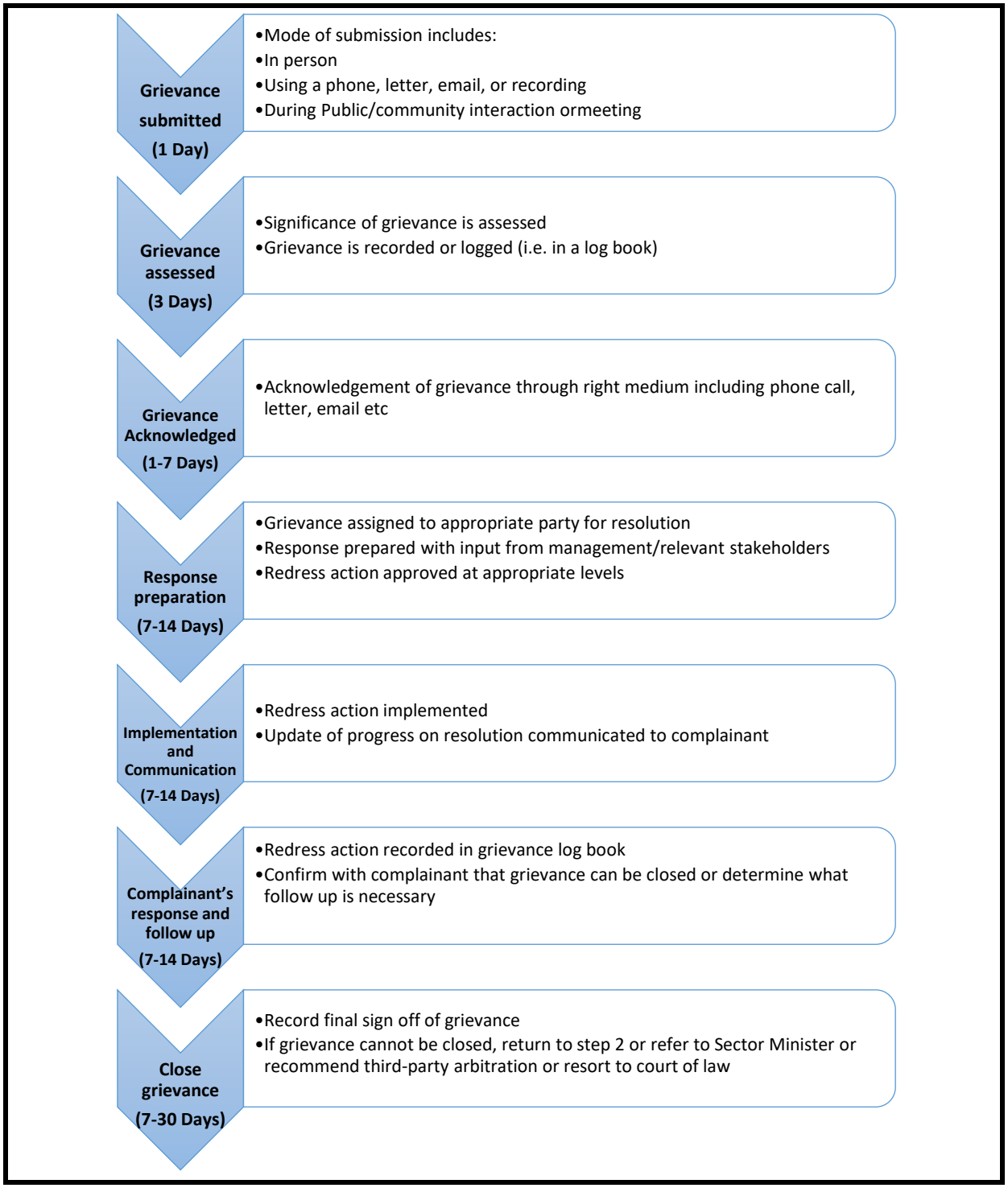


Figure 10- 1: Procedure for Grievance Redress

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 1,091,000**.

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**			**266,000**	
	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			**1,091,000**	

CONCLUSION

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

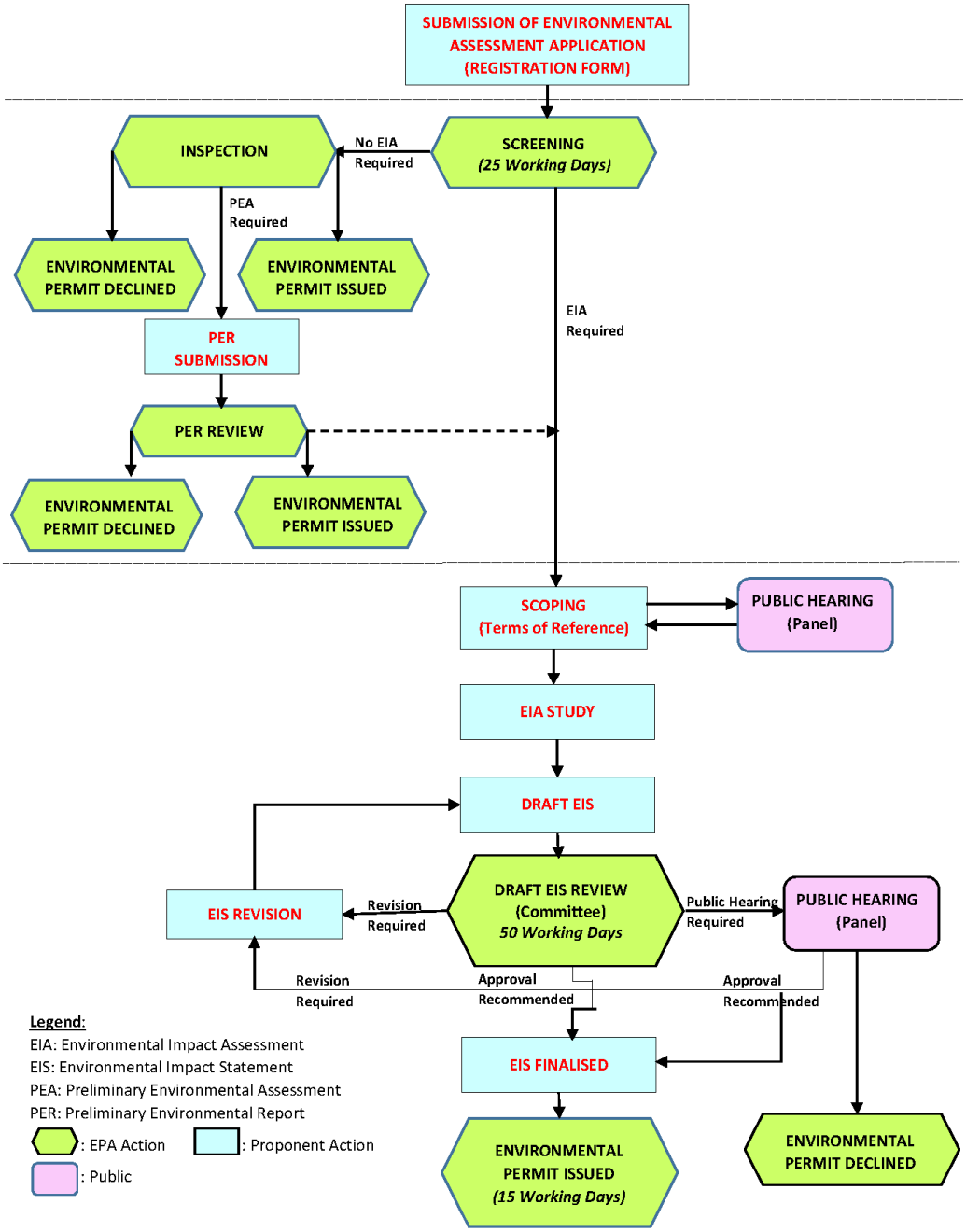
Assessments have shown that the project generally has moderate impacts on the environment and impacts could be further mitigated with the adoption of good health, safety and environment practices. Occupational, public health, safety and security issues and impacts will be properly managed to prevent 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

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 Municipal/ Metropolitan 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					
Ministry of Food and Agriculture – Savelugu	Christopher Dzukunu Mahama Dramani Sumani Ibrahim	MIS DDO DDO		17/11/2021	• **Resolution of land-related conflicts** – The project should collaborate with chiefs and traditional leaders in order to resolve land-related issues before commencing the project. • **Conduct of soil fertility tests** – The project should ensure that soil for commercial production be tested prior to cultivation in order to ascertain the fertility of the soil that necessary measures be put in place for higher yield. • **Bush fire education** – Farmers should be educated to on the effect of bush fire and its prevention especially as this is a major issue especially after harvest. • **Issues with Fulani herdsmen** – The project should ensure that care is taken with the Fulani herdsmen and if possible provide relocation for them to ensure project operates smoothly. • **Employment of competent personnel –** The project should ensure that experienced and dedicated technical staff are employed on the field to ensure project efficiency. • **Agricultural conservation practices –** In order to maintain good soil texture and fertility all year round appropriate conservation practises should be followed. • **Marketing of produce and post-harvest management –** Produce marketing can be difficult, therefore it should be carefully managed, and storage facilities should be available to cater for post-harvest losses. • **Value-addition/processing –** The project should procure machinery such as mills to process the produce by way of adding value to the raw farm produce. • **Resettlement planning –** Affected persons of the project should be adequately compensated after a consensus has been reached by both parties.
EPA – Tamale	Huriatu Moro	Programme Officer	0241583006	21/06/2022	• **Acquiring Environmental Permits – Farmers should acquire environmental permits before start of farming activities.** • **EPA Monitoring – the project should include EPA staff in the implementation phase of the project to monitor the compliance of the farmers with environmental standards.**

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
NADMO, Savelugu	Imoro Alhassan Ibrahim Yakubu Yahuga Sayibu	Director Administrator Stores	0200345908 0541592795 0245745493	23/11/2021	• **Bagre Dam Spillage/floods –** Seasonal floods that occur in the municipality due to the Bagre dam spillage should be taken into consideration by the project as this could be a potential risk to the project. • **Conduction of soil tests –** The project should conduct soil fertility tests to ascertain the suitability of the soil for higher crop yield. • **Infestation of fall armyworms –** The project should take precautions against fall armyworms which could cause havoc to crops that may be cultivated. • **Bush fires –** NADMO will liaise with the Ghana Fire Service to train fire fighters and community volunteers to handle bush fires as well provide education on the effects of bush fires on the project.
District Assembly, Savelugu	Lawrence Agyekum Sakara Faozia Ibrahim A. Gombilla	Municipal Budget Officer Deputy Director Municipal Dev. Planning Officer	0244530056 0245848995 0543047931	25/11/21	• **Support from the District Assembly –** The assembly is willing to provide support to any project that will improve the production of farmers in the community. • **Resettlement planning –** This is a very critical issue and the project should see to it that affected persons are adequately compensated. • **Land-related issues –** Land acquisition for the project may be difficult, so the authorized land owners and stakeholders, such as chiefs, should be consulted to avoid any potential disputes. • **Industrial park –** At Nabogu, the district has secured land for the development of farm processing industries. As a result, this project will contribute to the efforts already undertaken. • **Bagre Dam spillage –** The spillage of the White Volta from the Bagre Dam could pose a risk to the project.
Ghana National Fire Service, Savelugu	Alhassan Mohammed Sadia Mahama Simon Kofi Beekley	Safety officer Fire woman Assistant Station Officer	0555929665 0241840417 0240998545	20/11/2021	• **Preservation of water bodies –** The project should put measures in place to preserve existing water bodies as this serves as farm boundaries and also helps to curb bush fires. • **Training of fire volunteers –** Fire volunteers from the farming communities should be trained to provide immediate assistance in the case of fire outbreaks. • **Soil tests –** The project should conduct water logging as well as fertility tests to determine the suitability of soil for maximum crop production.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Inadequate logistics –** The Fire Service department should be provided with adequate logistics like vehicles to facilitate project monitoring and training of fire volunteers.
Private Institutions – Category B					
Commercial Farmer, Savelugu	Imoro Alhassan	Farmer	0200345908		• **Land availability –** Farm land is available at Gushie area which only needs to be stumped. Moreover, there are vast tracts of land suitable for the growth of maize, soy, and rice. • **Lack of storage facilities –** The project should provide adequate storage facilities and warehouses to store produce after harvest since they are kept in the open and in homes. • **Inadequate machinery –** There's not enough agricultural tractors to plough fields, for example, delaying planting at the start of the season, and the ones that are available are broken. The project should procure such machinery as harvesters and tractors etc. to facilitate farming. • **Bush fire awareness –** There is the need for farmers to be educated on fire belt creation and other preventive measures during farming to help curb bush fires.
FBO, Savelugu	Sule Seidu James Japiong	General Supervisor General Manager	02040376131 0243233873	22/11/2021	• **Bush fires –** There is the need for bush fire awareness creation and education. This is because large acres of farm land are constantly destroyed due to bush fires resulting from lack of fire belts after crop harvesting and negligence of farmers. • **Soil fertility tests –** The project should verify that soil for commercial production is examined prior to cultivation to determine its fertility and that appropriate steps are taken to increase yield. • **Land issues –** In order to prevent land related conflicts, relevant land owners and stakeholders must be contacted for land acquisition before the inception of the project. The Integrated Tamale Fruit Company (ITFC) is also willing to collaborate with the project in food crop production.
FBO/FBG, Savelugu	Alhassan Shaibu Iddrisu Adam Baba Mohammed	Member Member Secretary	0547486747 0545743531 0596263681	19/11/21	• **Scarcity of arable land –** Farmland is scarce. Available land is mostly rocky. • **Land susceptible to flood –** The arable land capable of cultivation crops is prone to flooding. • **Commercial farmers occupying most arable lands –** Commercial farmers occupy the majority of farmland, thus others should be given bonds to allow them to farm as well.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
Supplier, Savelugu	Alhaji Alhassan Red Mahama Amadu	CEO Supplier	0242179580 0247486333	20/11/2021	• **Political interference –** To ensure that the project is implemented successfully, the project should be devoid of all political interference. • **Procurement of quality seeds –** The project should procure quality seeds for farmers in order to increase the yield of farm produce. • **Storage facilities –** The Busaka warehouse in Savelugu for example should be reconstructed and new facilities provided to prevent post-harvest losses. • **Availability of food –** The project will help provide adequate food in the community as production will be increased. • **Income generation –** The increase in farm yield will generate income as farm produce is supplied to consumers.
Community and Focus Group – Category C					
Sawaba, Savelugu	Sualihu Abdul-Basit Salifu Mohammed Adam Sulemana Mohammed Saaka Mohammed Fuseini				• **Community Awareness of Project –** The community is not aware of the project. The community however understands the project. • **Land Acquisition and Involuntary Resettlement –** The community is 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 have a positive impact by creating jobs for the people, opening up the communities for investment, and promoting community development. • **Land Ownership –** All the land is stool land. • **Land Use –** The land is mainly used for farming. • **Land Right and Access –** The people access the land through their chiefs. Moreover, there are no squatters present who may be affected by the acquisition of land. • **Land Related Conflicts –** Community members have experienced land-related conflicts. Land boundaries were the typical issues of conflict which have been resolved by traditional leaders. However, conflicts are not frequent. • **Livelihood Activities –** The main livelihood activities include: farming, petty trading, and animal husbandry. • **Livelihood Challenges –** Capital acquisition, high cost of farm inputs, lack of technical know-how in farming, and issues with theft are among the major livelihood challenges in the area. • **Community Population –** The community has a population of about 23,752. • **Ethnic Groups –** Members of the community belong to the Dagomba ethnic group.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Migrant Population –** There are no migrants in the community. • **Vulnerable Groups –** There are vulnerable persons in the community. • **Religion –** Islam (90%) is the major religion followed by Christianity (10%). • **Women Headed Households –** About 210 households are headed by women. • **Indigenous people –** There are no such people in the community. • **Support for Less Privileged –** The LEAP project provides support for the less privileged present in the community. The months of June and July are the most difficult in terms of having money. • **Key Decision Makers –** Chiefs and elders, Assembly member, and opinion leaders are the key decision makers in the community. The community is represented in government decisions through the assembly member, DCE and the MP of which they are satisfied with their representation. • **Women in leadership** – Women are not involved in decision making. • **Local groups** – Local groups present include: women VSLA groups, providing financial support to members and youth groups that help to promote peace and development. • **Appointment of community leadership** – Community appoints its leaders through election by members. • **Existing traditional/cultural groups** – The Tora and Simpa groups for women dance, the Jara, Bamaya and Nabiegu groups for men dance. • **Festivals and sacred events/sites** – The Bugum Fire festival celebrated in August, and the Damba festival celebrated in October, are the festivals undertaken in the community. The Sakpuli Slave site may be impacted by the project. • **Health care** – The community has a Poly clinic and a CHIP Compound. The nearest hospital and the nearest clinic are both located in Savelugu. • **Educational facilities** – The community has a primary school, a Junior High School and a Senior High School. • **Water and Sanitation** – Water is supplied to the community through stand pipes, pumps, and wells. • **Utility Services** – Energy available to the community include: fuel wood, charcoal, and electricity. The community also has access to 3 mobile phone networks. • **Quality of life** – The quality of life in the community is satisfactory. The prevailing peace, the availability of food and basic social amenities make life positive in the

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					community. A change in sanitary conditions and waste disposal, in addition to road network expansion will improve the quality of life in the community. • **Community needs/priorities** – Water, Farming, and quality health care are the three topmost needs of the community.
Nakpanzoo, Savelugu	Baba Mohammed Issah Mohammed Adam Abukari Alhassan Mohammed Mohammed Sayibu Mohammed Sualesu	Secretary Chairman Organiser Member Treasurer	0243741097 0245375424 0249249715 0553985174 0546913102 0247900699		• **Community Awareness of Project –** The community is not aware of the project. The community however understands the project due to similar projects previously undertaken. • **Land Acquisition and Involuntary Resettlement –** The community is 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 have a positive impact by expanding their farming activities. The community is interested in knowing the lifespan of the project. • **Land Ownership –** All the land is stool land. • **Land Use –** The land is mainly used for farming and rearing of livestock. • **Land Right and Access –** The people access the land through their chiefs. Moreover, there are no squatters present who may be affected by the acquisition of land. • **Land Related Conflicts –** Community members have not experienced any land-related conflicts. • **Livelihood Activities –** The main livelihood activities include: farming, fishing, and charcoal burning. • **Livelihood Challenges –** Depletion of soil fertility, degraded vegetation cover, and declining water bodies are the main livelihood challenges. • **Community Population –** The community has a population of about 1062. • **Ethnic Groups –** Members of the community belong to the Dagomba ethnic group. • **Migrant Population –** There are migrants in the community from Mali and from the Fulani ethnic group. • **Vulnerable Groups –** There are no vulnerable persons in the community. Nevertheless, there are about 6 disabled persons in the community. • **Religion –** Islam (90%) is the major religion followed by Christianity (5%) and Traditionalists (5%). • **Women Headed Households –** About 5 households are headed by women. • **Indigenous people –** There are no indigenous people in the community.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Support for Less Privileged –** There is no support for the less privileged in the community. The months of May and June are the most difficult in terms of having money. • **Key Decision Makers –** Youth leaders**,** Elders, and women leaders are the key decision makers in the community. The community is represented in government decisions by an assembly member, however they are dissatisfied with their representation. • **Women in leadership** – Women are involved in decision making through women representatives known as 'magasia'. • **Local groups** – Local groups present include: VSLA group, providing financial support to members, farmers' group and shear pickers that provide support to its members. • **Appointment of community leadership** – Community appoints its leaders on age basis, by ethnicity, by experience and on character basis. • **Existing traditional/cultural groups** – The Tora, Sapashini and Simpa groups for dance purposes at festivals and funeral ceremonies. • **Festivals and sacred events/sites** – The Bugum Fire festival celebrated in August, Eid-ul Adha and the Damba festival celebrated in October, are the festivals undertaken in the community. No sacred/important site may be impacted by the project. • **Health care** – The community has a children's weighing center. The nearest clinic is located in Nabogu and the nearest hospital in Savelugu. • **Educational facilities** – The community has a primary school, but no Junior High and Senior High School. • **Water and Sanitation** – Water is made available to the community through the Nabogu river. • **Utility Services** – Energy mainly available to the community include: fuel wood, and charcoal. The community also has access to 3 mobile phone networks. • **Quality of life** – The quality of life in the community is low as they lack basic social amenities like public toilets, clinics, and pipe-borne water among others. The community has a large area of farm land and electricity which makes life positive. Provision of a clinic will improve the quality of life in the community. • **Community needs/priorities** – Water, Farming, and quality health care are the three topmost needs of the community.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
Diare, Savelugu	Alhassan Abdul-Rahman Saaka Alhassan Braimah Tia Alhassan Tia Ayishetu Braima Samata Alhassan Ibrahim Abdulai	Chairman Secretary Member Member Member Member Treasurer	0245954275 0245951712 0243052500		• **Community Awareness of Project –** The community is not aware of the project. The community however understands the project. • **Land Acquisition and Involuntary Resettlement –** The community is not aware there may be land acquisition and resettlement as a result of the project. • **Project Impact on Community –** The community feels that the initiative will benefit them by increasing the output of their produce and, as a result, providing income. The community is interested in knowing the particular crop needed by the project. • **Land Ownership –** All the land is stool land. • **Land Use –** The land is mainly used for farming and rearing of livestock. • **Land Right and Access –** The people access the land through the chief. Moreover, there are squatters present who may be affected by the acquisition of land. • **Land Related Conflicts –** Community members have not experienced any land-related conflicts. • **Livelihood Activities –** The main livelihood activities include: farming, trading, and rearing of livestock. • **Livelihood Challenges –** The community has challenges with capital acquisition, improved breeds of livestock for crossing, irregular climate patterns. • **Community Population –** The community has a population of about 7842. • **Ethnic Groups –** Members of the community belong to the Dagomba ethnic group. • **Migrant Population –** There are migrants in the community from Mali and from the Fulani ethnic group and the Frafra ethnic group from Bolgatanga. • **Vulnerable Groups –** There are vulnerable persons in the community as well as disabled persons in the community. • **Religion –** Islam (90%) is the major religion followed by Christianity (10%). • **Women Headed Households –** There are about 78 women headed households. • **Indigenous people –** There are indigenous people in the community. • **Support for Less Privileged –** There is support for the less privileged in the community through the LEAP project. The months of April through July are the most difficult in terms of having money. • **Key Decision Makers –** Chief and elders, opinion leaders and the assembly members are the key decision makers in the community. The community is represented in

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					government decisions by an assembly member, however they are dissatisfied with their representation. • **Women in leadership** – Women are involved in decision making through the unit committee and the women representatives known as 'magasia'. • **Local groups** – Local groups present include: VSLA group, providing financial support to members, farm groups, and youth groups providing assistance to each other. • **Appointment of community leadership** – Community appoints its leaders through lineage succession. People with mental health issues are forbidden from being elders/leaders. • **Existing traditional/cultural groups** – Cultural groups in the community includes: 'Bamaya', for dance purposes, 'Lonsi', for conducting chiefs to gatherings, 'Simpa', that perform youth dances, 'Kambonsi', who are warriors and the 'Wanzams', that perform shaving activities. • **Festivals and sacred events/sites** – The Fire festival celebrated in October, and the Damba festival celebrated in November, are the festivals undertaken in the community. Sacred/important sites like shrines may be impacted by the project. • **Health care** – The community has a health centre. The nearest clinic is located in Nambapala and the nearest hospital in Savelugu. • **Educational facilities** – The community has a primary school and a Junior High, but no Senior High School. • **Water and Sanitation** – Water is made available to the community through boreholes, wells, dams and other small water systems. • **Utility Services** – Energy mainly available to the community include: fuel wood, and charcoal. The community also has access to 3 mobile phone networks. • **Quality of life** – The quality of life in the community is better because there is no conflict and there is a large farm area. A bountiful farm produce and capital for trading will improve the quality of life in the community. • **Community needs/priorities** – Water, Farming, and education are the three topmost needs of the community.
Tindang, Savelugu	Ayishetu Yakubu Meili Mahamadu			23/11/2021	• **Community Awareness of Project –** The community is not aware of the project. The community however understands the project.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
	Fajima Zakaria Memunatu Mahamadu Mata Ziblim Azara Mahamadu Abibata Abukari Ayi Mahamadu Rahi Yahaya Salamatu Alhassan Abdulai Meimunatu Abiba Yakubu Sanatu Mahamadu Adisa Yakubu Fatimata Iddrisu Ayisha Abdul Rahaman Azara Yahaya Kpiliga Warahama Mahamadu Sanatu Musah Yahaya Azara	0542433966 0545302198 0246753977 0545347699 0555601470			• **Land Acquisition and Involuntary Resettlement –** The community is aware there may be land acquisition and resettlement as a result of the project. • **Project Impact on Community –** The community feels that the initiative will benefit them by increasing the output of their produce and, as a result, providing income. • **Land Ownership –** All the land is stool land. • **Land Use –** The land is mainly used for farming and rearing of livestock. • **Land Right and Access –** The people access the land through the chief. Moreover, there are squatters like the Fulanis present who may be affected by the acquisition of land. • **Land Related Conflicts –** Community members have not experienced any land-related conflicts. • **Livelihood Activities –** The main livelihood activities include: farming, trading, and shea butter production. • **Livelihood Challenges –** The community has challenges with capital acquisition, availability of potable water, healthcare, machinery such as grinding mill for food processing and entrepreneurship. • **Community Population –** The community has a population of about 1263. • **Ethnic Groups –** Members of the community belong to the Dagomba ethnic group. • **Migrant Population –** There are migrants in the community from the Fulani ethnic group from Niger. • **Vulnerable Groups –** There are vulnerable persons in the community as well as a disabled person in the community. • **Religion –** Islam (96%) is the major religion followed by Traditionalists (4%). • **Women Headed Households –** There are about 9 women headed households. • **Indigenous people –** There are no indigenous people in the community. • **Support for Less Privileged –** There is no support for the less privileged in the community. The dry season is the most difficult in terms of having money. • **Key Decision Makers –** Chief and elders, youth groups and women representatives are the key decision makers in the community. The community is represented in government decisions by an assembly member, however they are dissatisfied with their representation. • **Women in leadership** – Women are involved in decision making women representatives known as 'magasia'.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Local groups** – Local groups present include: VSLA group, providing financial support to members, farm groups, shea butter group and youth groups providing assistance to each other. • **Appointment of community leadership** – Community appoints its elders through the chief. People with questionable character traits are forbidden from being elders/leaders. • **Existing traditional/cultural groups** – 'Nabiegu,' 'Takai,' and 'Tora,' all for dancing reasons, are among the cultural groups in the community. • **Festivals and sacred events/sites** – The community's festivals include the Fire festival in August, the Chimsi festival in October, the 'Kpeni' celebration in April/May, and the Damba festival in October. Sacred/important sites may be impacted by the project. • **Health care** – The community has no health facility. The nearest clinic is located in Kuldanali and the nearest hospital in Savelugu. • **Educational facilities** – The community has a primary school but no Junior High and Senior High School. • **Water and Sanitation** – Water is made available to the community through boreholes, and a dam. • **Utility Services** – Energy mainly available to the community include: fuel wood, and charcoal. The community has no access to mobile phone networks. • **Quality of life** – The members of the community enjoy a decent quality of life. Due to the availability of farmland, the community has a positive outlook on life. A plentiful harvest, safe drinking water throughout the dry season, rice and maize processing machinery, and access to health care would all improve the people's quality of life. • **Community needs/priorities** – Water, healthcare and Farming, are the three topmost needs of the community.
Gushie, Savelugu	Abubakari Sulemana Salifu Dawuni Issah Abdul-Rahman Alhassan Gurnndoo	Youth leader Achiri Yimahi-Naa Laligilana	0209022777 0504587843		• **Community Awareness of Project –** The community is not aware of the project. The community however understands the project. • **Land Acquisition and Involuntary Resettlement –** The community is not aware there may be land acquisition and resettlement as a result of the project. • **Project Impact on Community –** The community feels that the initiative will benefit them by creating employment for the youth and providing food security as well. • **Land Ownership –** About 95% of the land is stool land and 5% being government land.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
	Saaka Nindoo	Silinboma –Naa	0561320530		• **Land Use –** The land is mainly used for farming and rearing of livestock. • **Land Right and Access –** The people access the land through the chief. Moreover, there are no squatters present who may be affected by the acquisition of land. • **Land Related Conflicts –** Community members have not experienced any land-related conflicts. • **Livelihood Activities –** The main livelihood activities include: farming, rearing of livestock. • **Livelihood Challenges –** The community has challenges with climate change, lack of veterinary officers, lack of farm inputs and machinery such as fertilizer etc. • **Community Population –** The community has a population of about 3500. • **Ethnic Groups –** Members of the community belong to the Mole-Dagbani ethnic group. • **Migrant Population –** There are migrants in the community from the Fulani ethnic group from Niger and Mali, as well as the Moshi and Frafra ethnic groups. • **Vulnerable Groups –** There are vulnerable persons in the community as well as a disabled person in the community. • **Religion –** Islam (96%) is the major religion followed by Traditionalists (4%). • **Women Headed Households –** There are no women headed households. • **Indigenous people –** There are no indigenous people in the community. • **Support for Less Privileged –** There is no support for the less privileged in the community. The months of June through August are the most difficult in terms of having money. • **Key Decision Makers –** Chief and elders, youth groups and women representatives are the key decision makers in the community. The community is represented in government decisions by an assembly member, and they are satisfied with their representation. • **Women in leadership** – Women are involved in decision making women representatives known as 'magasia'. • **Local groups** – There are no local groups present in the community. • **Appointment of community leadership** – Community appoints its elders through succession. People with questionable character traits are forbidden from being elders/leaders.

Stakeholder/ Institution/ Location	Contact Person(s)	Role	Contact No.	Date	Concerns Raised/ Information Received
					• **Existing traditional/cultural groups** – 'Nabiegu,' for cultural dance, 'Simpa' for youth dance, 'Attair' group which serves the interest of the youth and 'Kabousi' – the warriors in the community are among the cultural groups in the community. • **Festivals and sacred events/sites** – The community's festivals include the Bugum festival celebrated in January, the Damba festival celebrated in March, and the Yam festival in October. The project may have an impact on land east of the Gushei locality, where cultivating land is forbidden. • **Health care** – The community has no health facility. The nearest clinic is located in Diare and the nearest hospital in Savelugu. • **Educational facilities** – The community has a primary school and a Junior High but no Senior High School. The nearest Senior High school is located in Pong, Tamale. • **Water and Sanitation** – Water is made available to the community through boreholes, and a dam. • **Utility Services** – Energy mainly available to the community include: fuel wood, electricity and charcoal. The community has access to 3 mobile phone networks. • **Quality of life** – The members of the community have a low quality of life. The availability of a good land for farming and the presence of water bodies make life positive in the community. The employment of good farming practices, provision of good quality seeds, adequate farm machinery like harvesters and processes etc. would provide a better quality life for the community. • **Community needs/priorities** – Healthcare, potable water and Farm machinery, are the three topmost needs of the community.

Republic of Ghana Ministry of Food & Agriculture African Development Bank

SAVANNAH AGRICULTURE VALUE CHAIN DEVELOPMENT PROJECT

(SADP)

AIR QUALITY, NOISE ASSESSMENT AND WATER QUALITY ANALYSIS

SAVELUGU MUNICIPAL

(NAKPANZOO 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 Nakpanzoo community (**Figure 2**) a selected community in the Savelugu Municipality.

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 is 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 Nakpanzoo community in the Savelugu Nanton District. This community was selected as a beneficiary community of the upcoming SADP project.

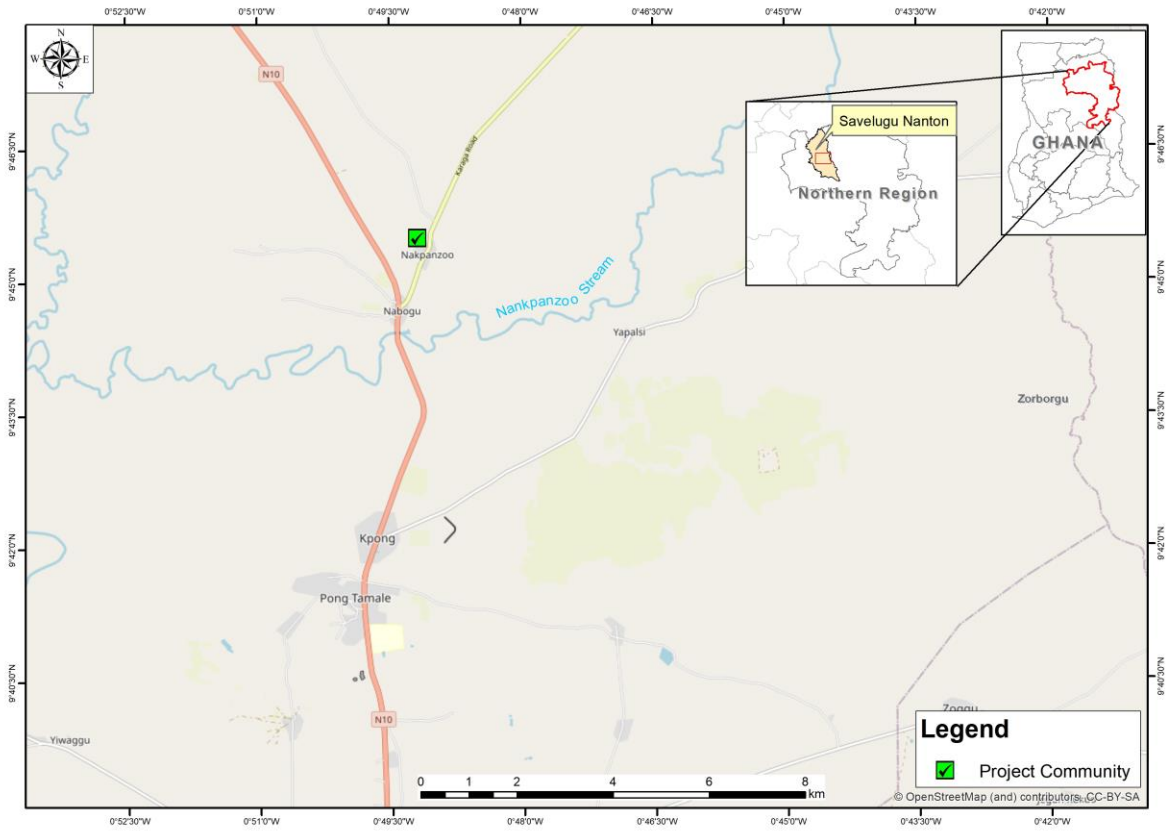

Figure 2:Location Map showing Nakpanzoo community

2.2 Sampling Location and Weather conditions

Table 3 and Table 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}	18/01/22	24HRS	9.755301	-0.818547	34^0C	19%	Clear/dry	NE 14Km/hr
$PM_{2.5}$	18/01/22	24HRS	9.755301	-0.818547	34^0C	19%	Clear/dry	NE 14Km/hr
NOISE ASSESSMENT Daytime	18/01/22	12HRS	9.755301	-0.818547	34^0C	19%	Clear/dry	NE 14Km/hr
NOISE ASSESSMENT Nighttime	18/01/22	12HRS	9.755301	-0.818547	22^0C	19%	Clear/dry	NE 14Km/hr

Table 4: Details of water testing locations

	Date	Sampling code and description		Longitude	Latitude
WATER SAMPLING	18/01/22	Nakpanzoo Stream		9.755301	-0.818547

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 µg/m^3 using the formula below.

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

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 Plate 1 below:

Plate 1:Setting up ARA N-FRM sampler 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 Plate 2.

Plate 2:Noise monitoring in the Nakpanzoo community

2.5 Water Sampling

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

This is a relatively clean source of water based on the in-situ testing results and results from CSIR-WRI (table 8).

The community relies mainly on the Nakpanzoo stream for drinking, washing and farming.

Plate 3: Nakpanzoo stream

The Nakpanzoo stream was sampled and tested on the, 18th January 2022 at 7:15am and 7:30am respectively (plate 5). 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.

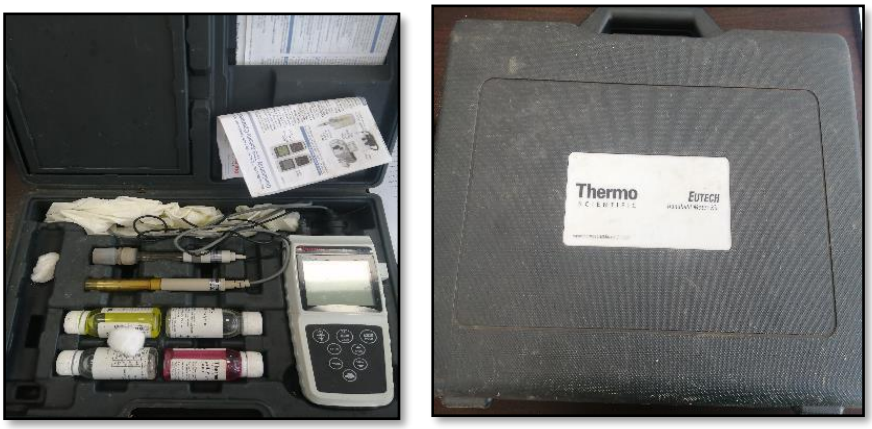

Plate 4:Thermo Scientific EUTECH Handheld Meter Kit

Plate 5 Stream 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 community were **19 µg/m³ and 45 µg/m³** respectively (See **table 5**).

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

Location	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)
Nakpanzoo Community	**19**	**45**
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: 18th to 19th 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 Nakpanzoo 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 Nakpanzoo community. The daytime ambient noise levels (LEQ) recorded was 54.5 dB(A) at the Nakpanzoo Community.

Table 6: Day Ambient Noise Results.

Location	L_{EQ}	L_{10}	L_{50}	L_{90}	L_{MAX}
Nakpanzoo Community	**54.5**	**57.7**	**48.0**	**42.4**	**76.3**
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: 18th January 2022					

- From the Table above, the daytime noise levels complied with the GSA standards at the Nakpanzoo community.
- During the monitoring, the observed sources of noise were from intermittent passing of motor bikes, bleating of goats and some form of chatter amongst community members passing by.

3.2.2 Nighttime Ambient Noise Levels

The Table 7 below shows the measured daytime noise levels at the Nakpanzoo community. The nighttime ambient noise levels (LEQ) recorded was 47.9dB(A) at the Nakpanzoo Community.

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

Location	LA_{EQ}	L_{10}	L_{50}	L_{90}	L_{MAX}
Nakpanzoo Community	47.9	50.5	43.7	40.1	67.2
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: 18th to 19th January 2022					

- From the Table above, the nighttime noise levels complied with the GSA standards at the Nakpanzoo community.
- During the monitoring, the observed sources of noise were from the rustling of winds, crickets chirping and bleating of goats.

3.2.3 Surface water Quality

The quality of the Nakpanzoo stream against WHO drinking guidelines is provided in **table 8** below.

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

Parameter	SN - **Nakpanzoo** stream)	WHO drinking water quality guidelines
pH	6.45	6.5 – 8.5
Conductivity, µS/cm	83.30	-
TOTAL DISSOLVED SOLIDS (TDS)	44.83	1000
TEMPERATURE	20.9^0C	-
TURBIDITY		-
TOTAL SUSPENDED SOLIDS (TSS)		-
NITRATE-NITROGEN		50
PHOSPHATE-PHOSPHORUS		

ALKALINITY		-
CHLORIDE		250
BOD		-
COD		-
OIL/GREASE		-
IRON		0.300
MANGANESE		0.400
Sampling and In-situ testing date: 17th January 2022		

4.0 CONCLUSION

Air Quality

The Particulate Matter ($PM_{2.5}$ & PM_{10}) concentrations monitored at Nakpanzoo 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 level (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 within the WHO drinking water guidelines, showing that the quality of the Nakpanzoo stream is generally good.

Annex 7: Pictures of stakeholder engagements

Consultation with MoFA Department of Agriculture, Savelugu

Plate 1: Meeting with Project Proponent

Savelugu Municipal Assembly

National Disaster Management Organization (NADMO), Savelugu Municipal

Plate 2: Meetings with representatives of Government Institutions

Meeting with Commercial Farmers

Meeting with Produce Suppliers

Engagement with Farmer Based Organizations

Plate 3: Private Sector Engagement

Chief and elders of Gushie, Savelugu

Assembly men from some Electoral Areas in Savelugu

Women's Group in Tindang community

Plate 4: Community Engagement