



GOVERNMENT OF GHANA

MINISTRY OF ROADS & HIGHWAYS

**GHANA HIGHWAY AUTHORITY
DEPARTMENT OF URBAN ROADS
DEPARTMENT OF FEEDER ROADS**

**ENVIRONMENTAL AND SOCIAL
ASSESSMENT**

**FOR TRANSPORT SECTOR IMPROVEMENT
PROJECT (P151026)**



MARCH 2017

List of Acronyms

AER	Annual Environmental Report
AIT	Agency Implementation Team
ARIs	Acute Respiratory Infections 3
BA	Beneficiary Agency
BECE	Basic Education Certificate Examination
BOST	Bulk Oil Storage & Transportation Company
BP	Bank Policy
BRT	Bus Rapid Transit
CERSGIS	Centre for Remote Sensing and Geographic Information System
CI	Conservation International
CIA	Cumulative Impact Assessment
CPESDP	Coordinated Program of Economic and Social Development Policies
CWSA	Community Water and Sanitation Agency
DBOMT	Design-Build-Operate-Maintain-Transfer
DFR	Department of Feeder Roads
DUR	Department of Urban Roads
DVLA	Driver and Vehicle Licensing Authority
EA	Environmental Assessment
EAR	Environmental Assessment Regulations
ECG	Electricity Company of Ghana
ECOP	Environmental Code of Practice
ECOWAS	Economic Community of West African States
EHS	Environmental Health and Safety
EIA	Environmental Impact Assessment
EIS	Environmental Impact Statement
EMP	Environmental Management Plan
EMU	Environmental Monitoring Unit
EPA	Environmental Protection Agency
EPAA	Environmental Protection Agency Act
ESA	Environmental and Social Assessment
ESAs	Environmentally Sensitive Areas
ESAP	Environmental and Social Action Plan
ESM	Environmental and Social Management
ESMF	Environmental and Social Management Framework
ESMS	Environmental and Social Management System
ESMU	Environmental and Social Management Unit
FC	Forestry Commission
FSD	Forest Services Division
GAMA	Greater Accra Metropolitan Area
GASIP	Ghana Agriculture Sector Improvement Program
GDHS	Ghana Demographic and Health Survey
GDP	Gross Domestic Product
GHA	Ghana Highway Authority
GLSS	Ghana Living Standards Survey
GoG	Government of Ghana
GPRS I	Ghana Poverty Reduction Strategy
GPRSII	Growth and Poverty Reduction Strategy
GRFS	Ghana Road Fund Secretariat

GRM	Grievance Redress Mechanism
GRS	Grievance Redress Service
GSGDA I	Ghana Shared Growth and Development Agenda I
GSGDA II	Ghana Shared Growth and Development Agenda II
GPRTU	Ghana Private Road Transport Union (of the TUC)
GUTP	Ghana Urban Transport Project
GWCL	Ghana Water Company Limited
HIV/AIDS	Human Immuno-deficiency Virus/ Acquired Immune Deficiency Syndrome
IA	Implementing Agencies
ICT	Information and Communication Technology
IFAD	International Fund for Agriculture Development
IFR	Interim Financial Report
ILO	International Labour Organisation
IRI	International Roughness Index
ITP	Integrated Transport Plan
KTC	Koforidua Training Centre
LAC	Limits of Acceptable Change
LGU	Local Government Unit
LI	Legislative Instrument
LVD	Land Valuation Division
MDAs	Ministries, Departments and Agencies
MESTI	Ministry of Environment, Science and Technology and Innovation
MLGRD	Ministry of Local Government, Rural Development
MMDAs	Metropolitan, Municipal and District Assemblies
MOFA	Ministry of Food and Agriculture
MoH	Ministry of Health
MoT	Ministry of Transport
MP	Management Plan
MRH	Ministry of Road and Highways
MSLC	Middle School Leaving Certificate
MTDP	Medium Term Development Plan
MTEF	Medium Term Expenditure Framework
MTTU	Motor Transport and Traffic Unit
NCCP	National Climate Change Policy
NDPC	National Development Planning Commission
NEAP	National Environmental Action Plan
NGO	Non-Governmental Organization
NMMTMP	National Multi Modal Transportation Management Plan
NMT	Non-Motorised Transport
NMTDP	National Medium Term Development Plan
NRSC	National Road Safety Commission
NSDF	National Spatial Development Framework
NTP	National Transport Policy
O&M	Operation and Management
OPRC	Output and Performance-based Contracting
OPD	Out Patient's Department
OSH	Occupational Safety and Health
PEA	Preliminary Environmental Assessment
PEIR	Public Expenditure Institutional Review

PER	Preliminary Environmental Report
PIT	Project Implementation Team
PIU	Project Implementation Unit
PLWAs	People Living with AIDS
PLWD	People Living with Disability
PMMR	Performance Management and Maintenance of Roads
PMU	Project Management Unit
PNDC	Provisional National Defence Council
PPP	Public-Private Partnership
PSS	Project Specific Standards
PROTOA	Progressive Transport Owners' Association
PSC	Project Steering Committee
PWD	Public Works Department
RSDP	Road Sector Development Programme
RTI	Respiratory Tract Infections
RTTFP	Road Transport and Transit Facilitation Program
SADA	Savanna Accelerated Development Authority
SDG	Sustainable Development Goal
SEA	Strategic/Sectoral Environmental Assessment
SMTDPs	Sectoral Medium Term Development Plans
SHS/SSS	Senior High School/Senior Secondary School
STDs	Sexually Transmitted Diseases
SVP	Southern Voltaian Plateau
TCPA	Town and Country Planning Authority
TOR	Terms of Reference
TSDP	Transport Sector Development Program
TSIP	Transport Sector Improvement Program
TSP	Transport Sector Project
UEMOA	West African Economic and Monetary Union
UNEP	United Nations Environment Programme
URTI	Upper Respiratory Tract Infection
UTP	Urban Transport Project
VEC	Valued Ecosystem Component
VSB	Voltaian Sandstone Basin
WB	The World Bank
WD	Wildlife Division
WHO	World Health Organisation
WRC	Water Resources Commission

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EXECUTIVE SUMMARY

Introduction

The Government of Ghana (GoG) through the Ministry of Roads and Highways (MRH) intends to combine the well-known and traditional methods of road rehabilitation and reconstruction with the new concept of output and performance-based contracting (OPRC) and public-private partnership (PPP) instruments for the management and maintenance of selected trunk, feeder, and urban roads in the country to strengthen road asset management and preservation. Each road type has its specific user characteristics and the methodology has to be adapted accordingly. Performance-based contracting is of particular interest to GoG, as the design and construction risks are transferred to the Contracting Entity who will be paid a lump sum amount to provide (and maintain) the road at specific levels of service. The introduction of the PPP and OPRC will have significant implications for social and environmental impact assessments in the road sector. This has warranted the revision of the existing Road Sector Environmental and Social Management Framework (ESMF) prepared in 2007 to accommodate the PPP and OPRC contracting model. The new revised ESMF is currently under preparation.

This ESA is intended for use for all roads (Tamale-Yendi-Tatale road and yet to be identified feeder roads) under the WB-funded Transport Sector Improvement Project (TSIP).

Rationale and Objective

The ESA is prepared to serve as a safeguard document to examine the environmental and social risks of the Tamale-Yendi-Tatale road under the TSIP. The ESA document also provides guidance in designing appropriate measures and plans to reduce, mitigate and/or offset adverse impacts and enhance positive outcomes. The overall objective and purpose of the ESA are summarized as follows: i) Assessment of potential adverse environmental and social risks or impacts commonly associated with road project activities and in particular the Tamale-Yendi-Tatale road and the ways to avoid, minimize or mitigate them; ii) To provide guidance on procedures and methodologies for the environmental and social assessment, review, approval and preparation and implementation of Environmental Management Plans (EMPs) of sub-projects (feeder roads) to be financed under the TSIP; iii) To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to TSIP; iv) To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESA; and v) To provide practical information resources for implementing the ESA.

The approach adopted for the preparation of the ESA is based on the new ESMF (the updated ESMF is currently under review) and includes: a) Review of relevant legislations, policies and other documents; b) Baseline environmental and social condition of the proposed Tamale-Yendi-Tatale road corridor; c) Social and environmental impact assessment and mitigation measures based on the current road conditions; d) Consultations with key stakeholders and field observations; e) ESA implementation and management; and f) Application of ESMF principles to the feeder roads.

Relevant Policies, Laws and Regulations

The implementation of the activities proposed under the TSIP will be consistent with all applicable policies, laws, regulations, and notifications. The implementing entities (MOT, MRH, DFR, DUR and GHA) and the contracting entity will ensure that project activities are consistent with the applicable regulatory and legal frameworks. Additionally, the implementing agencies will ensure that activities are consistent with World Bank Safeguard Policies. The key, relevant and applicable policies, laws and regulations of GoG, as well as policies and guidelines of the World Bank have been outlined in the ESA. These need to be updated as and when new laws, regulations and policies are made and enforced or the existing ones are revised.

Road Network and Classification

Roads are the dominant means of transportation in Ghana and they are categorized into three types; trunk roads, urban roads and feeder roads. Trunk roads are roads that run through the country connecting the regions and linking Ghana to its neighbours. The feeder roads connect from the towns and villages into the main trunk roads while the urban roads are the roads within the cities and major towns. The road network has a functional classification system for each road type. The road classification is given in the Table below.

Road Classification

Trunk Road	Feeder Road	Urban Road
National	Inter District	Major Arterial
Inter-Regional	Connector	Minor Arterial
Regional	Access	Distributor/Collector
-	-	Access/Local

As of 2015, there was about 72,381 km of roads. This is made up of 42,045 km of feeder roads, 15,462 km of urban roads and 14,874 km of trunk roads. Table 3-2 below shows the trend of the network size and condition for the period 2012-2015.

Road network size and condition (2012-2015)

Network Condition	2012		2013		2014		2015	
	%	Length (km)	%	Length (km)	%	Length (km)	%	Length (km)
Good	42%	28,588	45%	31,978	35%	24,872	39%	28,210
Fair	28%	19,059	25%	17,766	33%	23,451	32%	23,127
Poor	30%	20,420	30%	21,319	32%	22,740	29%	21,044
Network Size								
Trunk Roads	13,477		14,873		14,873		14,874	
Urban Roads	12,400		14,000		14,500		15,462	
Feeder Roads	42,190		42,190		42,045		42,045	
Total Network	68,067		71,063		71,418		72,381	

Source: Ministry of Roads and Highways

Transport Sector Improvement Project (TSIP)

The overarching development objective of the proposed TSIP is to support Government of Ghana improve the management of Transport Sector and improve road asset management of the classified road network. The following specific objectives are

pursued: (i) reduce travel time on selected parts of the classified road network in northern Ghana through the introduction of asset management contracts and to (ii) promote road safety.

The TSIP will include the following components:

- Component 1: Road Asset Preservation (Estimated costs US\$127.0 million)
 - *Sub-Component 1.1: Development of a Road Asset Management System*
 - *Sub-Component 1.2: Improved Asset Management on the Trunk Road Network (managed by the Ghana Highways Authority (GHA))*
 - Improvement / rehabilitation of about 181 km of Tamale-Yendi-Tatale road including minor potential realignments to improve road safety
 - *Sub-Component 1.3: Improved Asset Management of the Feeder Road Network (Managed by Department of Feeder Roads (DFR))*
 - Improvement / rehabilitation and longer term maintenance of about 150-250 km of Feeder and Farm roads in a prioritized geographical area in the northern part of Ghana
- Component 2: Improved Road Safety (Estimated cost US\$8 million)
 - *Sub-Component 2.1: Supporting the National Road Safety Commission (NRSC)*
 - *Sub-Component 2.2: Supporting the Driver and Vehicle Licensing Authority (DVLA)*
- Component 3: Institutional Strengthening and Capacity Building (Estimated cost: US\$ 15 million)

The MRH will have overall responsibility for project implementation. Other implementing agencies are MOT, GHA, DUR, and DFR. To facilitate smooth implementation, MRH will develop a Project Implementation Manual (PIM), that will include: (a) institutional coordination and day-to-day execution arrangements of the project; (b) disbursement and financial management; (c) procurement; (d) environmental and social safeguards procedure/due diligence; (e) monitoring, evaluation, reporting and communication; and (g) such other administrative, financial, technical and organizational arrangements and procedures as may be required for the project.

A mainstreamed structure has been adopted by GoG for the project consisting of (a) a Project Steering Committee (PSC); (b) a full-time Project Coordinator (PC); and (c) three Agency Implementation Teams (AITs).

Summary of Assignment of Implementation Teams

Component/Subcomponent	Agency Implementation Team (AIT)
1.1 Road Asset Management System	MRH
1.2 Improved Asset Management on the Trunk Road Network	GHA
1.3 Improved Asset Management on the Feeder Road Network	MRH
2.1: Supporting the National Road Safety Commission (NRSC)	MOT
2.2: Supporting the Driver and Vehicle Licensing Authority (DVLA)	MOT
3: Institutional Strengthening and Capacity Building	MRH, MOT, GHA

Baseline Conditions

The natural resources, social and climatic conditions as well as land form, land use and related characteristics that have relevance or implications for the Tamale-Yendi-Tatale road development and the road sector generally is described in Chapter 5 of the ESA.

Potential Environmental and Social Impacts and Mitigation

Road infrastructure and indeed the transport sector play a strategic role in the socio-economy development of Ghana. A wide range of environmental and social benefits will arise as a result of road sector projects and programs. These will include economic benefits, employment generation, social services, travel and transport, enhanced gender opportunities, fuel economy and reduced pollution. In addition to the numerous benefits, road sector projects and programs will also have potential adverse environmental and social impacts. For the Tamale-Yendi-Tatale road these include: Health and safety impacts (including injuries and HIV/AIDS); Water Resources Impacts; Landscape Alteration; Impacts on Soils; Land Acquisition and Property Loss; Community and Economic Activities Impacts; Noise and Vibration Impacts; Potential Impacts on Cultural Resources; Minor Habitat Disruption; Waste Generation and Disposal Impacts; Traffic Disruption and Diversion Impacts; and Utility Disruption Impacts.

The general mitigation principles covering the above mentioned thirteen broad areas of impacts are provided for use in the project. Risk assessment of the TSIP and measures for controlling the identified risks has also been outlined.

ESA Implementation and Management

The ESA provides an approach for managing environmental and social issues/impacts in the project. It also includes general guidance on the management measures to be adopted for various types of planned investments under the project. The key ESA areas relevant to the successful implementation of safeguards are outlined, and include:

- Safeguards management approach and process;
- Institutional arrangements;
- Capacity building;
- Environmental and social monitoring and reporting; and
- Environmental and social principles and clauses.

Within the framework of EPA's EA Procedure and the World Bank Operational Policies, the ESA presents specific steps and responsibilities for safeguards management in the TSIP.

Stakeholder Participation

The key elements of the citizen engagement strategy for TSIP include the following: (i) Disclosure of important project related information by the implementing agencies and contracting entities on its website and at the appropriate local level and other disclosure procedures agreed with the Bank, (ii) framework for consultation with the key stakeholders including the affected communities and important road user groups (e.g., GPRTU) during planning, design and implementation of all sub-projects; (iii) free, prior, informed consultation with the affected communities and key road user groups and their representatives for obtaining broad community support as a part of preparation of specific sub-projects relevant to that area; (iv) the establishment of Grievance Redress Mechanisms (GRM) at PIT, IA (AIT) and project site levels detailed in this document to meet specific grievance redress requirements of operations/projects; (v) promoting community based risk reduction initiatives with the participation of and

networking with relevant stakeholders including women, school children, youth, civil society organizations, and local bodies.

To ensure stakeholders' participation in the planning phase and aiming at promotion of public understanding of project scope, activities and impacts, various sections of project affected persons and other groups will be engaged in various consultation throughout the planning and implementation of the project.

Borrowers Capacity Assessment

The major capacity issues has to do with the staffing numbers, skill sets and the availability of and exposure to the use of basic environmental monitoring equipment (e.g. noise and dust monitoring) and appropriate modern technologies (including GPS) within the main implementing road sector agencies (MRH, GHA, DUR, and DFR). The staff strength of the environmental and social safeguards units/desks of the road sector agencies are grossly inadequate, lack the full complement of the variety of skill sets (e.g., Social and Environmental Safeguards Specialists) needed to perform their functions, and are highly under-resourced with respect to the equipment and modern technologies needed to perform their required functions and roles effectively and efficiently. Under the TSIP, full time Monitoring Consultants will be engaged who will monitor the performance of the Contracting Entity to deliver the promised product, in terms of safety, riding surface, maintenance, environment, etc. so as to make monthly payments. This will also mean additional work for the agency safeguards staff with respect to oversight of Monitoring Consultants and review of monitoring reports. Additional staff and training will be required and some hand held equipment such as noise monitors, particulate matter (PM10) monitors, cameras with built-in GPS and SOx, NOx and CO2 monitors. In addition, computer and smart phone-based monitoring system to facilitate rapid tracking of project activities and for quick generation of various kinds of reports will be required.

To mitigate the safeguards capacity constraints, the following specific institutional strengthening measures are adopted: i) the appointment of a full-time social specialist with gender experience; ii) the use of a Non-Governmental Agency (NGO) to assist communities and oversee the grievance redress system; iii) focused training programs for safeguards staff; and iv) dedicated funding for safeguards operational costs.

Provisional Budget for ESA Implementation

An estimated budget of USD2.11M will be required to implement the ESA, with provisional breakdown as presented below.

Item	Description	Amount (USD)
1	Hiring of Safeguards Specialist(s) for AIT	450,000
2	Implementing Agency safeguards capacity development	200,000
3	Training for various relevant stakeholder groups	260,000
4	Allowances for preparation of subproject safeguard documents	300,000
5	Annual reviews	200,000
6	Equipment for Safeguards Teams	100,000
7	Vehicles (3No)	300,000
8	Operating Cost	200,000
9	Sensitization & Grievance Management by NGO	100,000
	Total	2,110,000

The above costs will be funded from TSIP Sub-Component 3.3. Costs related to the required mitigation measures for TSIP subprojects are not set out in the budgets

presented here. These will be assessed and internalized by sub-project specific ESIA's, EMPs, RAPs and ARAPs as part of the overall subproject cost.

With respect to resettlement/rehabilitation, all TSIP subproject specific RAPs will include a budget and identification of source of funding for payment of compensation. The RAPs will also include a time table for the payment of such compensation. Counterpart funding from the Government of Ghana will be used to fund resettlement/rehabilitation cost of road projects.

A grievance redress mechanism for TSIP operations/projects is outlined in this document for addressing legitimate concerns of affected individuals and groups who raise issues of concern during project implementation. The implementing agencies and contracting entities will establish information and grievance management systems as part of the environmental and social management planning of operations/projects. Effective management of grievances is especially important in the context of resettlement, compensatory payments, gender and child issues and where issues concerning entitlements may arise.

1.0 INTRODUCTION

In 2007, the then Ministry of Transportation developed a sectoral Environmental and Social Management Framework (ESMF) as a policy document establishing “principles and procedures that would govern the mitigation of potential adverse environmental and social impacts” which could arise as a result of Transport Sector Development Projects (TSDP) under the Department of Urban Roads (DUR), Department of Feeder Roads (DFR) and the Ghana Highway Authority (GHA).

Since 2007, two World Bank financed projects – the Transport Sector Project (TSP) and the Ghana Urban Transport Project (GUTP) – have referenced the sectoral ESMF in safeguards implementation. The contractual responsibilities in the preparation and implementation of the two projects were identical, with the environmental and planning units of the relevant Ministries, Departments and Agencies (MDA) taking responsibility for project and sub project safeguards including the preparation of the screening reports. The environmental management units of GHA, DUR and DFR were responsible for the initiation of environmental and social screening and the registration of the proposals with the Environmental Protection Agency (EPA). The EPA and other resource management agencies such as the Water Resources Commission (WRC), and the Forestry Commission’s Wildlife Division (WD) and the Forestry Services Division (FSD) also independently monitored the project activities.

The Government of Ghana (GoG) through the Ministry of Roads and Highways (MRH) intends to combine the well-known and traditional methods of road rehabilitation and reconstruction with the new concept of output and performance-based contracting (OPRC) and public-private partnership (PPP) instruments for the management and maintenance of selected trunk, feeder, and urban roads in the country to strengthen road asset management and preservation. Each road type has its specific user characteristics and the methodology has to be adapted accordingly. Performance-based contracting is of particular interest to GoG, as the design and construction risks are transferred to the Contracting Entity who will be paid a lump sum amount to provide (and maintain) the road at specific levels of service. The introduction of the PPP and OPRC will have significant implications for social and environmental impact assessments in the road sector.

OPRC transfers a significant burden of risk to the Contractor where the Contractor is responsible for designing and carrying out the works, services and actions the Contractor believes are necessary in order to achieve and maintain the Service Levels stated in the contract. The Contractor is also responsible for preparing site specific ESIA and ESMP based on detail design, environmental and social screening reports which will be prepared based on this ESA and RPF.

This ESA has been prepared to accommodate the expanded role of the private sector in the OPRC contracting arrangement, from the simple execution of works to the management and conservation of road assets over the duration of the contract. It is prepared to address environmental and social risks associated with the WB-funded Transport Sector Improvement Project (TSIP), involving the rehabilitation/reconstruction of Tamale-Yendi- Tatale road and selected feeder roads (from 220 to 250 km) in the Brong Ahafo, Northern, Upper East and Upper West regions of Ghana.

The rationale for preparing this ESA is as follows:

- Under the PPP / OPRC type of contracting, the detailed designs of project road operations are deferred to the Contracting Entity and consequently, the specific impacts are not known upfront;
- The project roads to be financed under the TSIP are yet to be identified (with the exception of the Tamale-Yendi-Tatale corridor for which concept designs are yet to be completed);
- In absence of the concept design, the MRH and the World Bank found it useful to have a safeguard instrument establishing principles and procedures that will govern the mitigation of adverse environmental and social impacts induced by the TSIP, to share with various stakeholders in the road transport sector.

1.1. Road Infrastructure Needs

The transport sector accounts for approximately 9% of the GDP and generates a significant share of the total budgetary revenue of the country. Ghana's transport system consists of one international airport, four domestic airports, an estimated national road network of 72,380 km in 2015, a limited rail network in the southern half of the country which has deteriorated considerably, and an underdeveloped inland water transport system. By far, road transport accounts for the bulk of transport services, constituting over 95% of total land transport services supply in Ghana. It has linkages with the economic sector with respect to macro-economic development, and in addressing conditions of rural equity for access and conveyance as economic development grows.

Roads are important indicators of the level and distribution of poverty in the country. For instance, the Ghana Statistical Service produced two poverty maps, one for 2005 and one for 2012, respectively using data from the most recent Census and Living Standards Surveys. These maps show the decrease in poverty incidence throughout Ghana over time. The northern part of Ghana had the smallest decrease with the largest number of poor (about 20.8 percent or 1.3 million of the total) residing in the Northern Region. The same Report also plotted the poverty map with the proximity to roads and maize yield respectively and showed a high correlation between the presence of road infrastructure and low poverty rates. South-western Ghana, where poverty is below 20 percent in most districts, has the best road network; the nearest road is, on average, less than an hour away. In the north, the average distance to the nearest road increases and poverty rates increase.¹ Transport improvement is known to be essential to accelerate connections to main food growing and potential agricultural growth areas of the country.

Some general problems of the road transport sector in Ghana include traffic congestion; inadequate maintenance, improvements and implementation of traffic control devices; and insufficient enforcement of traffic regulations. These problems could be attributed to the lack of proper institutional arrangement, capacity, regulatory mechanisms and enforcement, and also the lack of proper coordination. For instance, the various transport agencies have prepared separate, mode-focused policies which have produced

¹World Bank Project Information Document (PID) Concept Stage; Report No.: PIDC31437

an imbalance in the development of the individual modes, inhibited healthy competition and prevented the country from benefiting from inter-modalism.

1.2. Purpose and Objectives of the ESA

The purpose of preparing the ESA in the implementation of TSIP is to adapt for the MRH and the implementing agencies (and consultants and contracting entities) a framework that will facilitate compliance with relevant National, the World Bank and other safeguard requirements for road sector projects in a coherent manner. The ESA is prepared to identify and monitor the environmental and social impacts of Tamale-Yendi-Tatale road and selected feeder roads (in the Savanna Zone of Ghana) rehabilitation projects under the TSIP. The ESA also provides guidance in designing appropriate measures and plans to reduce, mitigate and/or offset adverse impacts and enhance positive outcomes.

The overall objective and purpose of the ESA can be summarized as follows.

- Assessment of potential adverse environmental and social risks or impacts associated with the Tamale-Yendi-Tatale and other feeder roads project activities under the TSIP and the ways to avoid, minimize or mitigate them;
- Identify a way of enhancing project's benefits and identify issues and/or obligations for addressing the management of social impacts to be included in contracts with project contractors;
- To establish clear procedures and methodologies for the environmental and social assessment, review, approval and implementation of project specific Environmental and Social Management Plans (ESMPs) for the TSIP feeder roads and detailed Environmental and Social Impact Assessments (ESIA) and ESMP for the Tamale-Yendi-Tatale road to be financed under the TSIP;
- To specify appropriate roles and responsibilities, and outline the necessary reporting procedures, for managing and monitoring environmental and social concerns related to TSIP;
- To determine the training, capacity building and technical assistance needed to successfully implement the provisions of the ESA; and
- To provide practical information resources for implementing the ESA.

The ESA is complemented by sector wide Environmental and Social Management Framework (ESMF) currently under preparation and a Resettlement Policy Framework (RPF) that establishes the Project resettlement and compensation principles and implementation arrangements.

1.3. Methodology for the ESA Preparation

The methodology used for the preparation of the ESA is briefly described below.

a. Review of relevant legislations, policies and other documents

The ESA preparation involved conducting review of the existing national legislations, policies, guidelines and institutional arrangements to ensure incorporation of updates, if any. The ESMF toolkit and template of the World Bank (February, 2008) and the World Bank Safeguards Policies and Performance Standards were reviewed and applied for the preparation of the current ESA. Moreover, various related documents such as road sector ESMFs/ESAs were consulted in the review process. Previous

project mission Aide Memoires and other similar project concept papers were also reviewed.

The main national and the World Bank reference documents reviewed were the following:

- Environmental Protection Agency Act, 1994 (Act 490);
- Environmental Assessment Regulations, 1999 (LI 1652);
- Ghana Shared Growth and Development Agenda 2, 2014 – 2017;
- Ghana National Transport Policy, 2008;
- Ghana Integrated Transportation Plan, 2011 - 2015;
- Transport Policy Strategic Environmental Assessment (SEA) Report;
- Urban Transport Policy Strategic Environmental Assessment (SEA) Report;
- Road Sector Medium Term Development Plan (RSMTDP), 2014 – 2017;
- Draft National Environmental Policy, 2012;
- The National Environmental Action Plan, 1993;
- The Ghana EIA Procedures;
- Ghana National Climate Change Policy, 2013;
- Lands Commission Act, 2008 (Act 767);
- Land Use and Spatial Planning Act, 2016 (Act 925);
- The World Bank’s Environmental and Social Safeguards Policies (OP/BP 4.01: Environmental Assessment; OP/BP 4.04: Natural Habitats; OP/BP 4.36: Forests; OP 4.09: Pest Management; OP/BP 4.11: Physical Cultural Resources; OP/BP 4.12: Involuntary Resettlement; and OP/BP 7.50: Projects on International Waterways); and
- IFC Good Practice Handbook: Cumulative Impact Assessment and Management: Guidance for the Private Sector in Emerging Markets.

b. Consultations and field observations

The process also involved consultation with key stakeholders in the road sector, in addition to the lead road sector institutions. Key stakeholders consulted included the MRH, Ghana Highway Authority (GHA), Department of Urban Roads (DUR), Department of Feeder Roads (DFR), Land Valuation Division (LVD) of the Lands Commission (LC) and the Environmental Protection Agency (EPA), among others.

Similarly, field visits were undertaken to potential areas of TSIP to assess possible impacts on bio-physical and socio-economic factors. Consultations were held with some local stakeholders, including local road sector bureaus (the northern regional directorate of GHA notably), local government administrations (the Mion District Assembly, Yendi Municipal Assembly, Zabzugu District Assembly and Tatale Sanguli District Assembly) and local community leadership, along the known TSIP road corridor (Tamale-Yendi-Zabzugu-Tatale). The leadership and personnel of the Ghana Immigration Service, Ports Health Unit of Ghana Health Service, and the Customs Division of Ghana Revenue Authority manning the Tatale-Nanchamba border post were also engaged.

The consultations focused on providing information on the proposed TSIP and the need to prepare an ESA to address the potential environmental and social impacts. The views of the consulted stakeholders were sought on the potential benefits and adverse impacts of the intended road rehabilitations and measures to address anticipated adverse

impacts. The ESA procedures were also presented and discussions were conducted to identify their concerns, opinions, institutional capacity gaps and other potential constraints to implementation of the procedures. The general concerns raised by stakeholders during these sessions include the potential disruptions in utility services, blockage of access to residents / businesses during construction, potential traffic disruptions, and the potential effects of the volatile security situation in the project environs among others. Pictures of the field visits and consultation sessions are included below and in Annex 19.

2.0 EXISTING POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORKS

The implementation of the activities proposed under the TSIP must be consistent with all applicable policies, laws, regulations, and notifications. It is the responsibility of the MOT, MRH, DFR, DUR and GHA (and the contracting entity) to ensure that project activities are consistent with the applicable regulatory and legal frameworks. Additionally, it is also to be ensured that activities are consistent with World Bank policies, Performance Standards and guidelines.

This section covers key, relevant and applicable policies, laws and regulations of GoG, as well as policies and guidelines of the World Bank. It does not present a legal opinion on the applicability of the law but serves as guidance for the application of the legal and regulatory provisions to the current project context. This chapter needs to be updated as and when new laws, regulations and policies prepared or the existing ones are revised.

2.1. The Constitution and Relevant National Environmental Requirements

The principal environmental provisions and requirements in Ghana include or are found in the:

- Constitution of Republic of Ghana, 1992;
- Ghana National Environmental Action Plan I & II (1993);
- Environmental Protection Agency Act, 1994 (Act 490);
- Ghana Environmental Impact Assessment Procedures (1995);
- Environmental Assessment Regulations, 1999 (LI 1652); and
- Environmental Assessment (Amendment) Regulations, 2002 (LI 1703).

The main environmental protection and management tools derived from the above list include the:

- Environmental Assessment (EA) system (comprising project-level EA and strategic-level EA) for proposed projects, policies, plans, programs, investments, etc.;
- Environmental management system (comprising environmental management planning, annual environmental reporting, compliance monitoring and environmental auditing) for implementation phase management of projects, plans, programs, etc.; and
- Other environmental quality and discharge guidelines, procedures and instruments.

The broad mandate for environmental protection and over-arching resources and development sustainability fall under the Ministry of Environment, Science, Technology and Innovation (MESTI), as the overall policy and coordinating entity, and the Environmental Protection Agency (EPA) as the lead regulator.

2.2. Ghana's Environmental Policy

The most effective tool for environmental protection is “prevention”. This is reflected in the Environmental Policy of Ghana formulated in the National Environmental Action Plan (NEAP) of 1993. The NEAP defined a set of policy and other actions that would make Ghana's development strategy more environmentally sustainable. The Ghana environmental policy aims at a sound management of resources and the environment, and to avoid developments that are unsound or environmentally destructive. The policy seeks reconciliation between economic development and natural resources

conservation with the view to make a high quality environment a key element supporting achievement of sustainable national development. Within this context and in relation to the transport sector, the policy seeks among others to:

- Develop procedures for the utilization of land resources that ensure the maximum degree of economy in the use of land and avoid or minimize conflicts;
- Institute and implement an environmental quality control and sustainable development programs by requiring prior EA of all developments; and
- Take appropriate measures to protect critical eco-systems, including the flora and fauna they contain against harmful effects, nuisance or destructive practices.

The specific objectives of the policy include:

- Ensuring sound management of natural resources and the environment;
- Protecting human, animals and plants and their biological communities and habitats;
- Guiding development in accordance with quality requirement to prevent, reduce and as far as possible eliminate pollution and nuisances; and
- Integrating environmental considerations in sectoral, structural and socio-economic planning at the national, regional, district and grassroots levels.

2.3. The Environmental Protection Agency Act

The Environmental Protection Agency (EPA) Act, 1994 (Act 490) grants the Agency enforcement and standards setting powers, and the power to ensure compliance with such standards and guidelines. The EPA is also mandated to ensure compliance with the Ghana EA requirements and procedures for proposed, as well as existing, “undertakings”. Additionally, the Agency is required to:

- Control and prevent the discharge of waste and the generation, treatment, storage, transportation and disposal of waste;
- Control and monitor use and advice on regulation and management of hazardous substances;
- Develop comprehensive database on environment and environmental protection for promotion of sound ecological systems, effective planning and sustainable development; and
- Create environmental awareness and build environmental capacity as relates all sectors.

The Agency is also vested with the power to determine what constitutes an “adverse effect on the environment” or an activity posing “a serious threat to the environment or public health”, to require EAs, EMPs, AERs, etc. of an “undertaking”, to regulate and serve an Enforcement Notice for any offending or non-complying undertaking, including transport sector undertakings. Furthermore, a requirement by EPA for an EA for an undertaking overrides any authorizing MDA from licensing, permitting, approving or consenting such undertaking, unless notified otherwise by the EPA.

2.4. Environmental Assessment Regulations and Procedures

The Environmental Assessment (EA) Regulations of Ghana combine both environmental assessment and environmental management systems. The regulations prohibit commencing an “undertaking” (including transport sector projects, investments, etc.) without prior registration and environmental permit.

Undertakings/activities are grouped into schedules to enable registration and securing environmental permit from the EPA through the EA system. The schedules include undertakings requiring registration and Environmental Permit (Schedule 1), EIA mandatory undertakings (Schedule 2), as well as Schedule 5 – relevant undertakings (located in Environmentally Sensitive Areas) in Ghana. Roads and highway projects fall under Schedule 2, and therefore require EIA. Schedules 1, 2 and 5 of the Ghana EA regulations are included as *Annex 1*.

The EA Regulations define the relevant stages in the procedure, including:

- Registration;
- Screening;
- Preliminary Environmental Assessment (PEA);
- Scoping and terms of reference (TOR);
- Environmental Impact Assessment (EIA);
- Public Notices and Public Hearing;
- Review of EA reports;
- Environmental permitting and certification;
- Environmental Management Plan (EMP); and
- Annual Environmental Report (AER).

The environmental management system (EMS) refers to the implementation phase environmental stewardship requirements for projects, etc. These include EMP, AER and Environmental Certification. The Regulatory Agency conducts compliance monitoring to verify compliance with given approval/permit conditions or against required environmental standard and/or project mitigations. The Agency may also require an environmental audit for a project. An Environmental Audit is a systematic environmental evaluation process that presents a comprehensive environmental status of an existing project or activity (including risks and liabilities).

An Annual Environmental Report is required to be submitted to the EPA on and for all undertakings granted Environmental Permit 12 months from commencement of operation, and annually thereafter. An annual report would provide an evidence of the extent of compliance with relevant mitigation commitments, monitoring requirements and results, etc. An Environmental Management Plan on the other hand, provides information on the system for meeting the environmental stewardship commitments (including mitigation and monitoring, training, reporting and resource allocation and responsibilities) for a project. EMPs are for projects qualified under PEA and EIA, and required to be submitted to EPA within 18 months of commencement of operations, and updated every 3 years thereafter.

2.5. Land Tenure and Acquisition

There are pieces of legislation relevant in the consideration of land, land tenure, right of way and acquisition. These include the:

- The Administration of Lands Act, 1962 (Act 123);
- State Lands Act, 1962 (Act 125);
- State Lands Regulations 1962 (LI 230);
- State Lands (Amendment) (No. 2) Regulations 1963 (LI 285);
- Lands (Statutory Way Leaves) Act, 1963 (Act 186);
- Office of the Administrator of Stool Lands Act, 1994 (Act 481); and
- The Lands Commission Act, 2008 (Act 767)

The Office of the Administrator of Stool Lands Act, 1994 generally provide for the administration of Stool Lands. The Act sets out among others the procedures for the administration of Stool Lands. The Administration of Lands Act, 1962 and the State Lands Act, 1962 are still in effect, however, with modifications necessary to give effect to the Office of the Administrator of Stool Lands Act. The Act defines the distribution of any revenue accruing from stool lands.

The Land Commission Act, 2008 streamlined land administration institutions by merging four land sector agencies into a single entity – the Lands Commission (LC) – and brought the title and deeds registries under one organizational unit, the Land Registration Division.

2.6. The World Bank’s Safeguard Policies

The World Bank's environmental and social safeguard policies are a cornerstone of its support to sustainable poverty reduction. The objective of these policies is to prevent and mitigate undue harm to people and the environment in the development process. These policies provide guidelines for the identification, preparation, and implementation of programs and projects. The Bank favours preventive measures over mitigations or compensatory measures, whenever feasible. The following WB environmental and social safeguard policies were triggered by TSIP:

- Environmental Assessment (OP/BP 4.01);
- Natural Habitats (OP/BP 4.04);
- Physical Cultural Resources (OP/BP 4.11);
- Involuntary Resettlement (OP/BP 4.12); and
- Forestry (OP/BP 4.36).

2.6.1. Environmental Assessment (OP/BP 4.01)

The objective of this policy is to ensure that road sector operations are environmentally sound and sustainable, and that decision-making is improved through appropriate analysis of actions and of their likely environmental impacts. This policy is triggered if a road sector operation/project is likely to have adverse potential environmental risks and impacts on its area of influence.

Environmental Screening

The Bank requires environmental screening of each proposed operation/project to determine the appropriate extent and type of EA. The Bank classifies the proposed operation/project into one of four categories, depending on the type, location, sensitivity, and scale of the project and the nature and magnitude of its potential environmental impacts:

- Category A: A proposed project is classified as Category A if it is likely to have significant adverse environmental impacts that are sensitive, diverse, or unprecedented. These impacts may affect an area broader than the sites or facilities subject to physical works. EA for a Category A project examines the project's potential negative and positive environmental impacts, compares them with those of feasible alternatives (including the "without project" situation), and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.

- **Category B:** A proposed project is classified as Category B if its potential adverse environmental impacts on human populations or environmentally important areas—including wetlands, forests, grasslands, and other natural habitats—are less adverse than those of Category A projects. These impacts are site-specific; few if any of them are irreversible; and in most cases mitigation measures can be designed more readily than for Category A projects. The scope of EA for a Category B project may vary from project to project, but it is narrower than that of Category A EA. Like Category A EA, it examines the project's potential negative and positive environmental impacts and recommends any measures needed to prevent, minimize, mitigate, or compensate for adverse impacts and improve environmental performance.
- **Category C:** A proposed project is classified as Category C if it is likely to have minimal or no adverse environmental impacts. Beyond screening, no further EA action is required for a Category C project.
- **Category FI:** A proposed project is classified as Category FI if it involves investment of Bank funds through a financial intermediary, in subprojects that may result in adverse environmental impacts.

2.6.2. *Natural Habitats (OP/BP 4.04)*

Natural habitats are land and water areas where (i) the ecosystems' biological communities are formed largely by native plant and animal species, and (ii) human activity has not essentially modified the area's primary ecological functions. The policy implementation ensures that Bank-supported development projects give proper consideration to the conservation of natural habitats, in order to safeguard their unique biodiversity and ensure the sustainability of the environmental services and products which natural habitats provide to human society.

The key objectives are to: (a) Protect, maintain, restore natural habitats and their biodiversity; and (b) Ensure sustainability of services and products which natural habitats provide to human society. This policy is applicable when a project (including any sub-project under a sector investment or financial intermediary loan) with the potential to cause significant conversion (loss) or degradation of natural habitats, whether directly (through construction) or indirectly (through human activities induced by the project).

2.6.3. *Physical Cultural Resources (OP/BP 4.11)*

The objective of this policy is to assist the implementing agency to avoid or mitigate adverse impacts of road sector projects on physical cultural resources. For purposes of this policy, “physical cultural resources” are defined as movable or immovable objects, sites, structures, groups of structures, natural features and landscapes that have archaeological, paleontological, historical, architectural, religious, aesthetic, or other cultural significance. Physical cultural resources may be located in urban or rural settings, and may be above ground, underground, or underwater. Their cultural interest may be at the local, provincial or national level, or within the international community.

The impacts on physical cultural resources resulting from project activities, including mitigating measures, may not contravene either the Country's national legislation, and OP/BP 4.11, or its obligations under relevant international environmental treaties and agreements. The following projects are classified during the environmental screening process as Category A or B, and are subject to the provisions of this policy: (a) any

project involving significant excavations, demolition, movement of earth, flooding, or other environmental changes; and (b) any project located in, or in the vicinity of, a physical cultural resources site recognized by the Country.

The implementing agency identifies physical cultural resources likely to be affected by sector projects and assesses its potential impacts on these resources as an integral part of the EA process, in accordance with the Bank's EA requirements. The TORs normally specify that physical cultural resources be included in the baseline data collection phase of the EA. As an integral part of the EA process, the implementing agency develop a physical cultural resources management plan that includes measures for avoiding or mitigating any adverse impacts on physical cultural resources, provisions for managing chance finds, any necessary measures for strengthening institutional capacity, and a monitoring system to track the progress of these activities. The physical cultural resources management plan must be consistent with the country's overall policy framework, OP/BP 4.11 and national legislation and takes into account institutional capabilities with regard to physical cultural resources.

2.6.4. *Involuntary Resettlement (OP/BP 4.12)*

Involuntary Resettlement is triggered in situations of physical displacement of people, land acquisition, or restrictions on land use, access to natural resources including legally designated parks and protected areas. The policy aims to avoid involuntary resettlement to the extent feasible, or to minimize and mitigate its adverse social and economic impacts. As a result, it seeks for alternatives to avoid displacement and promotes participation of displaced people if necessary in resettlement planning and implementation, and its key economic objective is to assist displaced persons in their efforts to improve or at least restore their incomes and standards of living after displacement. The policy prescribes compensation and other resettlement measures to achieve its objectives and requires that borrowers prepare adequate resettlement planning instruments prior to Bank appraisal of proposed projects.

This policy covers not only physical displacement (loss or relocation of home/shelter) but also economic displacement (loss of income or livelihood source due to loss of assets or access to assets). In the event that there are differences between national legislation and OP 4.12, the provision of the later will prevail during project implementation.

A Resettlement Policy Framework (RPF) for road sector operations has been prepared by the client to fulfil compliance with OP/BP 4.12.

2.6.5. *Forests (OP/BP 4.36)*

The OP/BP 4.36 aims at enhancing the environmental and social contribution of forested areas, and the need to reduce deforestation. The protection of forests through the control of forest-related impact of all investment operations is a concern of the policy. It promotes the restriction of operations affecting critical forest and conservation areas, while requiring that the sector and other relevant stakeholders should be consulted as appropriate. This policy applies to the following types of Bank-financed investment projects:

- (a) Projects that have or may have impacts on the health and quality of forests;
- (b) Projects that affect the rights and welfare of people and their level of dependence upon or interaction with forests; and

- (c) Projects that aim to bring about changes in the management, protection, or utilization of natural forests or plantations, whether they are publicly, privately, or communally owned. The Bank does not finance projects that contravene applicable international environmental agreements.

Under this policy:

- All projects must avoid significant damage to critical forests (forested critical natural Habitats), same as under the Natural Habitats OP 4.04.
- All projects must minimize and mitigate damage to other (non-critical) natural forests, same as OP 4.04.
- Critical forests are forest areas that qualify as critical natural habitats under OP 4.04:
 - Existing and officially proposed protected areas, including areas protected by traditional local communities (e.g., sacred forests).
 - Sites that maintain conditions vital for these protected areas.
 - Sites of known importance for biodiversity conservation (identified on the basis of high endemism, species richness, rarity or vulnerability of component species, etc.).

2.6.6. Policies on Public Consultation and Disclosure

In addition, OP/BP 4.01 requires that during the EA process, for all Category A and B projects, the implementing agency consult project-affected groups and local nongovernmental organizations (NGOs) about the project's environmental aspects and takes their views into account. The implementing agency will initiate such consultations as early as possible. For Category A projects, the implementing agency consults these groups at least twice: (a) shortly after environmental screening and before the terms of reference for the EA are finalized (i.e. scoping); and (b) once a draft EA report is prepared. In addition, the implementing agency will consult with such groups throughout project implementation as necessary to address EA related issues that affect them. The OP 4.01 is applicable to all components of Bank financed projects, even for co-financed components.

For meaningful consultations with the project-affected groups and local NGOs, relevant materials on the project should be made available to the public in a timely manner prior to consultation and in a form and language that are understandable and accessible to the groups being consulted. The materials or information may include; summary of the proposed project's objectives, description, and potential impacts and draft EA report.

2.6.7. Cumulative Impact Assessment (CIA)

Cumulative impacts are changes to the environment caused by an action (project or project activity) in combination with other past, present, and future human actions. A CIA is an assessment of these impacts. Assessment of cumulative impacts requires consideration of other assessment concepts, which are different from the conventional approaches used in EIA. Some of these concepts are the following:

- Assessment of impacts during a longer period of time into the past and future;

- Consideration of impacts on valued ecosystem components (VECs)² due to both the project of concern and interactions with other past, existing, and reasonably foreseeable future actions;
- Evaluation of significance in the consideration of other than just local and direct effects (such as indirect impacts, cumulative impacts, and impact interactions); and
- Assessment of impacts over a larger (i.e., “regional”) area.

The challenge is to determine how large an area around the action should be assessed, for how long, and how to practically assess the often complex interactions among the actions. In all other ways, CIA is fundamentally the same as EIA and often relies on established EIA practice.

Integrating CIA into the Project -Level EIA Process

The assessment of cumulative impacts should be thought of as an integral part of all stages of the EIA which should be ideally an iterative process. The potential for these impacts to occur should be considered during the following stages:

- Scoping
- Collection of baseline data
- Assessment of impacts
- Development of mitigation measures
- Analysis of alternatives
- Development of management and monitoring plans

The key stage for integrating CIA into the EIA process is during scoping. Scoping (or focusing) involves the identification of key concerns, thereby ensuring that the assessment remains focused and the analysis remains manageable and practical. This is the stage at which the requirements for the EIA study’s boundaries are decided upon.

In this context, the following requirements for considering the cumulative impacts of projects would be incorporated into the terms of reference for carrying out EIA studies:

- Define project activities along with other existing, in progress, or planned projects (for the reasonably foreseeable future) in the region that could contribute to cumulative effects on VECs. For uncertain cases, scenarios can be developed that include (i) definite future actions, (ii) definite future actions plus probable future actions (still involving some uncertainty), (iii) definite future actions plus probable and less probable future actions (with a higher degree of uncertainty);
- Identify the area of influence for the project (which may vary for different types of potential impacts);
- Identify the time boundary for the study, especially with regard to considering actions in the reasonably foreseeable future (e.g., a concomitant construction period or operation). Scenarios can be developed to identify temporal boundaries as well, particularly when there is uncertainty;
- Identify possible VECs in the region in or close to the project’s area of influence;

² VECs are the main objects of the cumulative impact assessment process. VECs are defined as any part of the environment that is considered important by the proponent, public, scientists, and government involved in the assessment process. Importance may be determined on the basis of cultural values or scientific concern. (Hegmann et al., 1999)

- Identify the VECs in the area of influence that should be considered in the study based on information related to current or anticipated future conditions, the existence of protected species or habitats, and the presence or anticipated presence of other human activities that would (adversely) affect the VECs; and
- Identify project-specific standards (PSS), including relevant regulatory and/or international thresholds and standards (providing information on the carrying capacity and limits of acceptable change (LAC) if possible).

Once requirements related to the assessment of cumulative impacts are incorporated into the project-specific EIA format, the adequacy of the cumulative impacts assessment in the EIA report should be checked during the review phase. This phase must ensure that cumulative impacts are addressed in the project EIA.

2.6.8. Disadvantaged or Vulnerable Status

OP 4.01 requires the environmental assessment to take into account social aspects relevant to the project, including those addressed in OP 4.10 and 4.12. Both OP 4.10 and 4.12 have specific requirements for the treatment of vulnerable groups. In accordance with Bank procedures, disadvantaged or vulnerable groups would be examined as part of the environmental assessment and Resettlement Action Plan (RAP).

2.7. The Ghana Shared Growth and Development Agenda 2 (2014 – 2017)

The Ghana Shared Growth and Development Agenda (GSGDA) II, 2014-2017, is the fifth in the series of medium-term national development policy frameworks prepared over the past two decades. It is the operational framework of the President's *Coordinated Programme of Economic and Social Development Policies (CPESDP), 2014-2020 – An Agenda for Transformation*, which was submitted to Parliament in December 2014 in fulfilment of Article 36, Section 5 of the Constitution.

The strategic direction underlying the GSGDA II is to leverage the natural resource endowments, agriculture potential and relatively large human resource base to accelerate socio-economic transformation through value addition and industrial production. This will be underpinned by partnership with the private sector to expand development of critical infrastructure through self-financing vehicles including Public-Private Partnerships (PPPs) and other commercial arrangements. The priority areas for PPPs are expected to include power generation, roads and railways, large-scale housing development, water, healthcare and sanitation and public safety.

In line with the Sustainable Development Goals (SDGs), and to address climate change concerns, the GSGDA 2 takes into consideration the need to promote basic living standards; and adoption of the principles of green economy in the national development planning and implementation, and enhance the capacity to mitigate and reduce the impact of natural disasters, risks and vulnerability.

Within this context of medium-term targets, policies and strategies to be implemented are prioritised in the following thematic areas:

- Ensuring and sustaining macroeconomic stability;
- Enhanced competitiveness of Ghana's private sector;
- Accelerated agricultural modernisation and natural resource management;
- Oil and gas development;

- Infrastructure and human settlements development;
- Human development, productivity and employment; and
- Transparent, responsive and accountable governance

The GSGDA 2 forms the basis for Donor Coordination within the framework of the Paris Declaration which requires all Donors to coordinate their support towards approved national agenda. It is also the strategic policy framework that guides the preparation of District and Sectoral Medium Term Development Plans, which form the basis of the annual budget of Ghana.

2.8. The National Transport Policy (2008)

The Ministry of Roads and Highways and the Ministry of Transport have adopted a sector approach with the formulation of the National Transport Policy (NTP) (currently under review) as the guide to development and improvement of transportation in general. The vision of the transport sector, as stated in the NTP, is to provide an integrated, efficient, cost-effective and sustainable transportation system.

The NTP defined the following strategic goals for improving the performance of the sector as follows:

- Establish Ghana as a Transportation Hub for the West African Sub-Region;
- Create a sustainable, accessible, affordable, reliable, effective, efficient, safe and secure transport system that meets user needs and is world class;
- Integrate land use, transport planning, development planning and service provision;
- Create a vibrant investment and performance-based management environment that maximizes benefits for public and private sector investors;
- Develop and implement a comprehensive and integrated Policy, Governance and Institutional Framework;
- Ensure Sustainable Development in the Transport sector; and
- Develop adequate Human Resources and apply new Technology.

Over the years, this has meant a more complex decision making environment as well as gradual re-orientation from a project-led approach to a strategy-led approach to planning investments in the Sector. This intention has been reinforced by Sector Medium Term Plans adapted from the Transport Sector Development Programme (2008-2012), the GSGDA II and the Integrated Transport Plan (ITP), which intends to facilitate the transition of transport development to a strategy-led approach.

2.9. The Road Sector Medium Term Development Plan (2014 - 2017)

The mission of the road sector is to “Provide leadership and an enabling environment for the development and maintenance of Ghana’s road transportation system through effective policy formulation, market regulation, asset management and service provision”. The Road Sector MTDP is anchored on the NMTDP 2014-2017 (GSGDA 2), which has seven thematic areas. The road sector identified four out of the seven GSGDA 2 thematic areas for which it aligned the sector’s objectives as shown in *Table 2-1* below:

Table 2-1 Linkages between GSGDA II and Road Sector Objectives

Ghana Shared Growth and Development Agenda Thematic Areas	Sectors Objectives
Thematic Area 2: Enhancing Competitiveness of Ghana's Private Sector	Sector goal 4: Create appropriate environment for private sector participation in the delivery of transport infrastructure
Thematic Area 5: Infrastructure and Human Settlements Development	Sector Goal 1: Establish Ghana as a Transportation Hub for the West African Sub-Region Sector Goal 2: Create and sustain an efficient and effective transport system that meets user needs Sector Goal 3: Integrate land use, transport planning, development planning and service provision Sector Goal 5: Ensure sustainable development and management of the transport sector
Thematic Area 6: Human Development, productivity and employment	Sector goal 6: Develop adequate skilled human resource base
Thematic Area 7: Transparent, Responsive and Accountable Governance	Sector goal 4: Create appropriate environment for private sector participation in the delivery of transport infrastructure Sector Goal 7: Develop and implement comprehensive and integrated policy, governance and institutional frameworks

The Road sector MTDP outlines the following priorities: (i) Asset preservation, (ii) road rehabilitation and international corridor development, (iii) Improved Financing and Cost recovery, (iv) Install and utilize planning and budgeting systems, (v) Improvement in Road Management, (vi) Capacity Building, (vii) Mainstreaming of crosscutting issues, (viii) Pro-poor Programs, and (ix) Collaboration with other sectors.

2.10. Institutional and Stakeholder Context

This section discusses the key road transport sector agencies, as well as the other stakeholder institutions whose statutory functions bear on or relate to the sector or activities thereof.

2.10.1. The Ministry of Transport (MOT)

The Ministry of Transport was established in January, 2009 by re-aligning the functions of the erstwhile Ministries of Aviation, Harbours and Railways and the Road Transport Services. The Ministry is responsible for policy development, coordination and oversight of aviation, inland water and maritime, railway and road transport services sub-sectors. It is being supported by fifteen (15) modal Agencies which provide services, regulations and infrastructure development. This is to ensure the integration and co-ordination of all the transport modes for better planning and effective utilization of resources. The MoT plays oversight role over the following:

Road Transport Services:

- National Road Safety Commission
- Metro Mass Transit Limited
- Intercity State Transport Corporation
- Driver and Vehicle Licensing Authority
- Government Technical Training Center

The MoT has a Deputy Director in-charge of Road Safety and Environment under the Directorate of Policy and Planning (See *Annex 2* for the organogram of MoT) and the various units under it that are relevant to the implementation of this ESA.

2.10.2. The Ministry of Roads and Highways (MRH)

The Ministry of Roads and Highways (MRH) has overall responsibility for the road infrastructure sector with the mandate of policy formulation, sector coordination and oversight, and sector performance monitoring and evaluation of the following broad areas:

- Road infrastructure development and maintenance; and
- Road maintenance financing.

The Departments, Agencies and Units that operate under the direct ambit of the MRH and the functions they perform are:

Road Infrastructure

- Ghana Highway Authority (GHA) - Responsible for the administration, planning, control, development and maintenance of trunk roads and related facilities in the country.
- Department of Feeder Roads (DFR) - Responsible for the administration, planning, control, development and maintenance of feeder roads and related facilities in the country.
- Department of Urban Roads (DUR) - Responsible for the administration, planning, control, development and maintenance of urban roads and related facilities in the country.

Road Transport Training

Koforidua Training Centre (KTC) - Centre for the training of professionals (engineers, contractors, consultants, administrator staff, etc.) in the road transport sector.

Road Maintenance and Financing

Road Fund Secretariat - established by Act 536 (1997) to finance the following activities:

- Routine and periodic maintenance of road and related facilities;
- Upgrading and rehabilitation of roads;
- Road safety activities;
- Selected road safety projects; and
- Such other relevant matters as may be determined by the Board.

Safeguards Management

The Director of Policy and Planning is responsible for ensuring the mainstreaming of crosscutting issues into all sector policies, plans, programmes and ensuing projects. In the road sector the issues regarded as crosscutting and mainstreamed in all activities include Environment, Social, HIV/AIDS, Road Safety, gender and Anti-corruption reporting. The Director undertakes this role with the assistance of two (2) safeguards officers (a Principal Engineer of 11 years experience and an Assistant Development Planning Officer of 1 year experience) as shown in the organogram of the ministry (see *Annex 3*).

The Director coordinates the activities of environmental units of the road agencies which oversees the day to day activities on the projects. On the schedule of environmental and social issues, the safeguards officers (who also work on other schedules) assist the Director Policy and Planning to;

- Respond to Issues on environment, social and other cross cutting issues in the sector.
- Coordinate the conduct of SEA on sector Policies, Plans and programmes
- Ensure inclusion of environmental and social considerations during project preparation
- Coordinate the preparation of environmental and social documents for projects
- Review environmental and social documents prepared for projects
- Coordinate the activities of environmental units in the road agencies
- Coordinate site visits with missions and report on environmental and social issues
- Liaise with other stakeholders (LVD, EPA, etc) to ensure that adequate and appropriate measures are made to safeguard the environment and compensate/resettle PAPs

The Public-Private Partnership (PPP) Directorate

The Ministry of Roads & Highways has a Public-Private-Partnership (PPP) Directorate which reports directly to the Chief Director and is responsible for the PPP processes in the road sector from project identification to contract signing and financial closure. This directorate is relevant to the implementation of this ESA because of the policy changes in the road sector to embrace PPP and OPRC models of contracting in road operations/project. The general roles of the Directorate are; capacity building, coordination, facilitation, review and advisory. The Directorate performs its responsibilities in close collaboration with the relevant directorates of MRH and other road agencies by leveraging all PPP skills in the sector to achieve timely delivery of projects. It also maintains a close link with the Public Investment Division (PID) of the Ministry of Finance (MoF) to ensure the proper alignment of the projects with national policy, priorities, and best practices.

Annex 3 shows the organizational structure of the Ministry of Roads and Highways and its units relevant to the implementation of this ESA.

2.10.3. Ghana Highway Authority (GHA)

GHA is a semi-autonomous body responsible for the provision and management of trunk roads. It was originally established in 1974 as the organisation responsible for the development and administration of the entire national road network. Since the GHA Act of December 1997, its role is limited to the administration, control, development and maintenance of trunk roads and related facilities subject to the policies of the MRH.

The GHA has a 4-person Environmental Management Unit (EMU) that has oversight of environmental and social issues of the Authority's mandate. The EMU operates under the Road Safety and Environment Division. *Annex 4* depicts the organisational structure of the GHA with its Road Safety and Environment Division. The Authority also has a Public-Private Partnerships (PPP) unit which facilitates and coordinates all PPP road contracting arrangements.

2.10.4. The Department of Feeder Roads (DFR)

The DFR is a civil service institution responsible for rural roads. It was set up under Government instrument in 1981 to have the sole responsibility for the administration, planning, control, development and maintenance of feeder roads and related facilities in the country.

The DFR has an Environmental, Health and Safety Unit responsible for environmental and social issues associated with the feeder road sub-sector. The Unit falls under the Planning Section of DFR and reports to the Deputy Director (Planning). However, the Unit works also with the Deputy Directors (Maintenance and Development). The Unit has two (2) staff, a Principal Engineer and an Environmental Officer. *Annex 5* provides the organogram of the DFR and its environmental and social safeguards unit.

2.10.5. The Department of Urban Roads (DUR)

The DUR is a civil service institution responsible for the administration, planning, control, development and maintenance of urban roads and related facilities in the country. It was established in 1989 as an implementing agency within the then Ministry of Roads and Transport (MRT) (now MRH). Prior to its establishment the responsibility for the urban roads were with the PWD and the then City Councils (now Municipal and Metropolitan Assemblies), and later with the GHA.

The DUR has an Environmental Unit responsible for handling environmental and social issues that arise in the pursuit of the DUR's functions and activities. The Environmental Unit is located within the Planning and Development Unit (See *Annex 6* for organogram). The unit has two staff, a Principal Planner and an Environment Officer.

2.10.6. Koforidua Training Centre (KTC)

The Centre falls under the responsibility of the Ministry of Roads and Highways. Its core mandate is to deliver practical hands-on skills and professional training for all levels of management and projects implementation personnel of Ministry of Roads and Highways and its stakeholders.

2.10.7. The Ghana Road Fund Secretariat (GRFS)

The Road Fund Secretariat was established by Act 536 (1997) to finance the following activities:

- Routine and Periodic Maintenance of road and related facilities.
- Upgrading and rehabilitation of Roads.
- Road Safety Activities. }
- Selected Road Safety projects; and
- Such other relevant matters as may be determined by the Board.

2.10.8. Environmental Protection Agency

The EPA has the mandate to decide on project screening, guide the conduct of any EA studies and to grant environmental approval for road sector projects to commence. Its mandate also covers monitoring of implementation phase of road projects to ensure compliance with approval conditions, mitigation measures, and other environmental commitments and quality standards.

2.10.9. Resource Management Institutions

The Water Resources Commission (WRC), the Wildlife Division (WD) and the Forest Services Division (FSD) of the Forestry Commission (FC) are the water, wildlife and forest resource management institutions respectively. These institutions become relevant whenever such resources under their management are likely to be impacted on or implicated in a proposed road project. Such a stakeholder institution would then be consulted in the planning and decision processing to prevent, avoid, reduce or mitigate the likely impact of the project. They may also have to give their consent with respect to the extent to which such resources may be affected or lost as a result of the road development.

2.10.10. Utility Service Providing Institutions

The ECG, GWCL, Vodafone and BOST are public/private institutions that provide and/or manage utility services including, electricity, water, telecommunications and petroleum transmission and storage infrastructure. These are all linear transmission facilities either through underground pipes or overhead lines, often along existing road network corridors (where roads exist). Road construction or re-construction and other road services and interventions tend to affect such transmission lines. These often require relocation, realignment, etc. to make room for the road project, which calls for the involvement of the respective utility companies or institutions to be consulted in the road project decision-making processes as appropriate.

The other institutions whose functions relate to the road sector, road project corridor selection and regulation, and project approvals and management include:

- Land Use and Spatial Planning Authority (LUSPA)
- Metropolitan, Municipal and District Assemblies (MMDAs)

The private sector also features prominently in the operations of the road infrastructure sector. Projects in the sector are opened to local contractors and other foreign contractors, and, typically, supervision of road works is mostly given to private consultants who could be local or foreign depending on the condition specific to the contracts.

3.0 ROAD CLASSIFICATION AND NETWORK COVERAGE

3.1. Road Network Classification System

Roads are the dominant means of transportation in Ghana and they are categorized into three types; trunk roads, urban roads and feeder roads. Trunk roads are roads that run through the country connecting the regions and linking Ghana to its neighbours. The feeder roads connect from the towns and villages into the main trunk roads while the urban roads are the roads within the cities and major towns.

The road network has a functional classification system for each road type. The road classification is given in *Table 3-1*.

Table 3-1: Road Classification

Trunk Road	Feeder Road	Urban Road
National	Inter District	Major Arterial
Inter-Regional	Connector	Minor Arterial
Regional	Access	Distributor/Collector
-	-	Access/Local

3.1.1. Trunk Roads

Trunk roads are classified using socio-economic considerations as follows:

- **National (N)** – Roads linking the national capital to regional capital, important border towns in neighbouring countries, ports and major tourist sites;
- **Inter-Regional (IR)** – Second hierarchy roads serving as important lines of communication between the various regions to ensure regional coherence; and
- **Regional (R)** – The third category link district capitals to their respective regional capitals or to the nearest district capitals and major industrial, trade or tourist centres.

3.1.2. Feeder Road System

The functional classification of the feeder road system is as follows:

- **Inter District** – Roads that cross more than one district;
- **Connector** – Feeder roads that link a trunk or higher class feeder road; and
- **Access** – Feeder roads that start from either a trunk or higher class feeder road and ends in a community.

3.1.3. Urban Road System

The urban road system is classified into four main classes as follows:

- **Major Arterials** – Roadways that serve most of the inter-city trips. Principal arteries are further divided into freeways and main arterials;
- **Minor Arterials** – They augment the major arterials in the formation of a network of roads that connect urbanised areas. Travel speeds on the minor arterials can be as high as those on the major arterials;
- **Distributor/Collector** – roads, which primarily carry traffic within individual urbanized areas and trip distances, are usually shorter than those on the arterial roads;
- **Access/local** – These are streets that provide access to residence and to adjacent lands and properties and residential driveways.

3.2. The Road Network Coverage

As of 2015, there was about 72,381 km of roads. This is made up of 42,045 km of feeder roads, 15,462 km of urban roads and 14,874 km of trunk roads. (See *Annex 7* for the spread of the road networks in Ghana for all the road agencies).

The network is comprehensive, connecting to neighbouring countries, linking all regions, districts, farming and tourist centres within the country. Currently, 39% of the road network is in good condition, 32% is in fair condition and 29% is in poor condition. The paved section of the network is only about 30%. The sector as a policy has prioritised maintenance of the existing network over expansion hence the network size has remained fairly constant over the past years. Maintenance coverage is targeted to increase annually to ensure a good condition. *Table 3-2* below shows the trend of the network size and condition for the period 2012-2015.

Table 3-2: Road network size and condition (2012-2015)

Network Condition	2012		2013		2014		2015	
	Percent	Length (km)	Percent	Length (km)	Percent	Length (km)	Percent	Length (km)
Good	42%	28,588	45%	31,978	35%	24,872	39%	28,210
Fair	28%	19,059	25%	17,766	33%	23,451	32%	23,127
Poor	30%	20,420	30%	21,319	32%	22,740	29%	21,044
Network Size								
Trunk Roads	13,477		14,873		14,873		14,874	
Urban Roads	12,400		14,000		14,500		15,462	
Feeder Roads	42,190		42,190		42,045		42,045	
Total Network	68,067		71,063		71,418		72,381	

Source: Ministry of Roads and Highways

3.3. The Road Sector and Output and Performance-based Road Contracts (OPRC) Concept

In the face of the huge resource constraints to expand, rehabilitate, maintain and operate the country's road networks and other transport infrastructure, the Government of Ghana has been looking for alternative sources of financing transport infrastructure in the country. Based on the World Bank's recommendation, the concepts of OPRC and PPP are being considered by the government.

In the traditional contracts for road works, the Contractor is responsible for the execution of works which are normally defined by the Employer. The Contractor is paid on the basis of unit rates for different work items, i.e., a contract based on "inputs" to the works. While this modality often brings improvement over force-account practices, too often the results are less-than-optimal as the Contractor has the wrong incentive, i.e., to carry out the maximum amount of works, in order to maximize its turnover and profits. Under this traditional way of "contracting out" works, the overall service quality for the road user depends on the quality of the design given to the Contractor who is not accountable for it (the design) and therefore the results are sometimes not satisfactory.

The output and performance-based road contract (OPRC), (also known as Performance-based Management and Maintenance of Roads (PMMR) Contract), has been used in

many countries over the past 20 years. The OPRC concept is in response to a growing need to find adequate contracting modalities for Public-Private Partnerships (PPP) in the Road Sector; and alternatives to traditional work contracts.

OPRC can be used to;

- Manage and maintain existing roads during multi-year periods
- Bring roads to a maintainable condition and then manage and maintain them for several years
- Rehabilitate and improve roads, and then manage and maintain them for several years
- Construct new roads, followed by a long period of management and maintenance

Primary objectives and expected benefits of OPRC modality

The main objectives of this model of contracting are:

- To better respond to a new approach to Road Network Management.
- To achieve better roads for the same money, or to use less money for assuring the same level of service. and
- To reduce the administrative effort for the Road Agency (fewer contracts)

The typical expected benefits for undertaking the OPRC include the following:

- reduce the amount of Ministries, Departments and Agencies (MDA) resources required on a road project;
- re-allocate or transfer rehabilitation and performance risks (by increasing the private sector/contractor’s commitment and accountability towards quality in rehabilitation and O&M services by transferring to them as much responsibility as possible);
- increase private contractor innovation;
- reduce the overall life cycle costs of the roads;
- reduce the managerial and financial burden on a weak public sector;
- provide better results and services to road users at lower cost; and
- support local communities.

Change of Approach

Table 3-3: Comparison of Characteristics of Traditional Contracting versus OPRC

Traditional Method-based Contracting Approach	OPRC Approach
Road by road (fixing bad roads)	Road sector efficiency (network management)
Project lending	Sector program financing
Road Engineer view (road characteristics)	Road user view (service levels)
Completion of works ... payment ... end	Provision of service level over long periods
Payment based on input quantities and unit prices	Payment based on outputs (agreed service levels)

Some key principles that need to be adhered to under the OPRC are that;

- Contract must remain attractive throughout contract period, and not only during initial period.

- Contractor has to ensure that road users get a certain level of service defined in terms of usability, road surface conditions, safety features, roadside assistance, etc. The level of service expected for each road in the network is described in the specifications included in the contract.
- Contractors get paid a fixed monthly amount if they fulfil the agreed performance criteria, and
- Contractors are free to decide (i) what to do, (ii) when to do, (iii) how to do, and (iv) where to do.

4.0 THE TRANSPORT SECTOR IMPROVEMENT PROJECT (TSIP)

The overarching development objective of the proposed TSIP is to support Government of Ghana improve the management of Transport Sector and improve road asset management of the classified road network. The following specific objectives are pursued: (i) reduce travel time on selected parts of the classified road network in northern Ghana through the introduction of asset management contracts and to (ii) promote road safety; and (iii) strengthen the institutional management of the sector.

4.1. Project Components

The TSIP will include the following three components:

Component 1: Road Asset Preservation (Estimated costs US\$127.0 million):

This Component aims at improving the sustainable management of the Ghana roads network with support for the establishment of a network-wide Road Asset Management System and the introduction of performance-based contracting, in the form of long-term asset management roads contracts based on design-build-operate-maintain-transfer (DBOMT) principles.

The project will introduce asset management contracts on selected parts of the networks managed by the GHA and DFR. The contracting methodology will use World Bank's sample bid document for Output and Performance-based Road Contracts (OPRC), as amended, and will be rolled out on both paved and unpaved roads. The asset management contracts will include the initial rehabilitation works and maintenance services in lump sum contracts where payments are based on achieving performance targets. Based on experience gained elsewhere the duration of these contracts would be between 7 and 10 years for paved and about 5 years long for unpaved roads.

The project activities are spread over two main road networks allowing all the respective responsible Agencies to gain experience with this new contracting arrangement after which Government could repeat and roll-out the methodology with similar, but domestically-funded, contracts.

Sub-Component 1.1: Development of a Road Asset Management System:

The Project will continue support, commenced in the ongoing TSP, for the development of a Road Asset Management System (RAMS) to be used by the GHA, DFR and DUR. The support will include expanding the GIS-system already in place to cover all the classified roads and verifying and uploading key road information data.

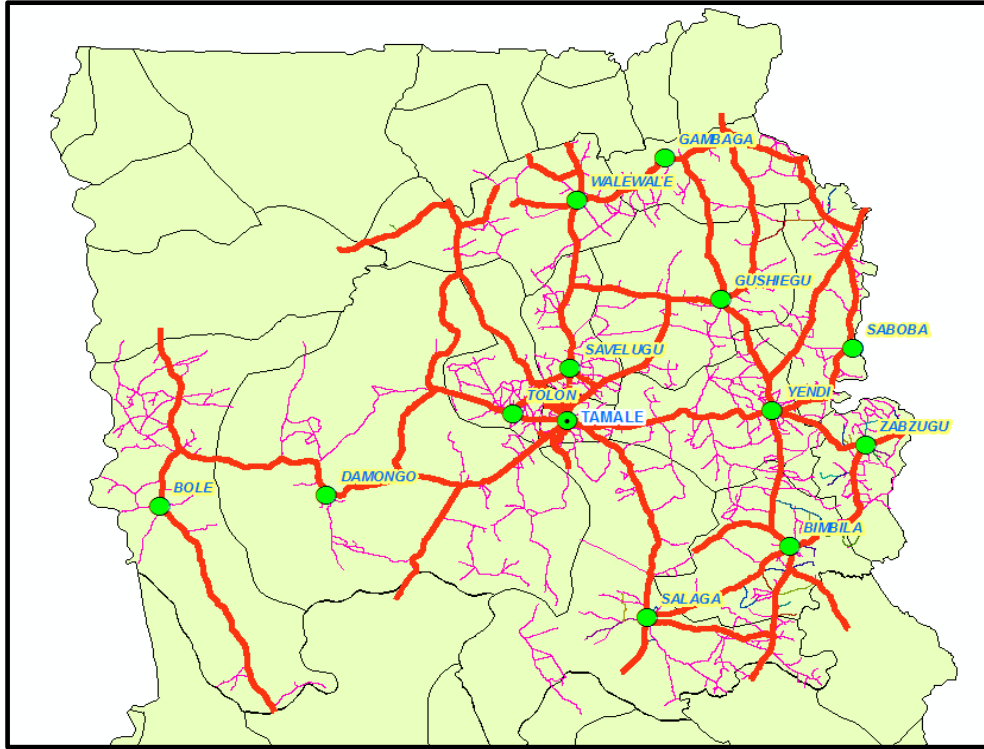
Sub-Component 1.2: Improved Asset Management on the Trunk Road Network Managed by the Ghana Highways Authority (GHA):

This sub-component aims at improving the weak implementation results, both in terms of delayed completion and cost overruns that the GHA has experienced in the recent past with the traditional approach of design-bid-build contracts. The introduction of performance-based contracts based on lump sum payments for providing and maintaining (preserving) the selected road links, will provide the GHA the opportunity to assess the benefits and value for money of this contracting methodology compared to the current system.

The selected road link from Tamale to Yendi and Tatale on the eastern border with Togo, is an integral part of the central east-west corridor linking the three north-south

corridors in the country. The road link consists of about 118 km of paved and about 63 km of unpaved roads³. *Figure 4.1*, below, shows the location of the Tamale-Yendi-Tatale road and road networks in the general area of the project.

Figure 4.1: Tamale-Yendi-Tatale Road and Road Networks in Northern Area



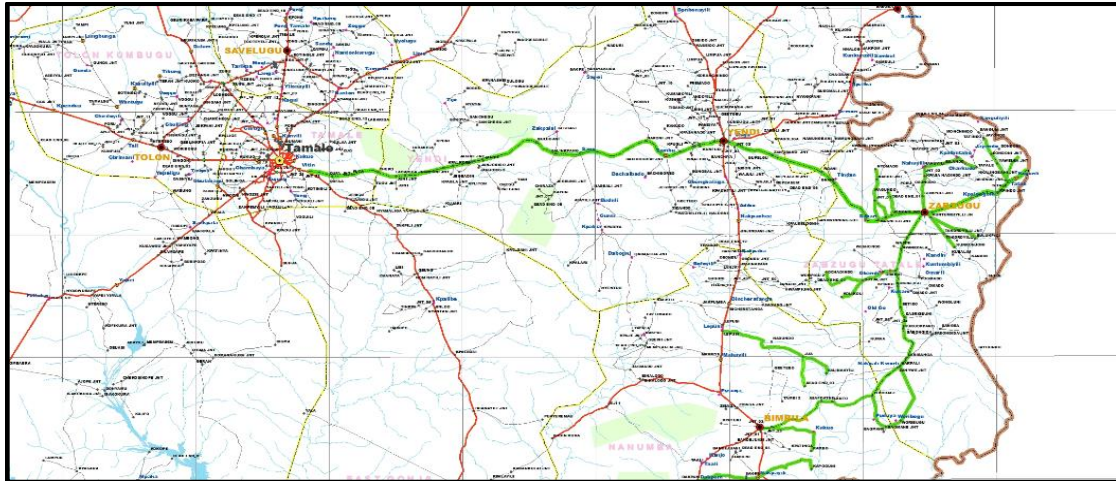
Source: Ministry of Roads & Highways

This sub-component will also provide support to operationalize the Tatale Border Post, currently manned but not operational due to lack of internet connectivity. Government has established north-south running fibre-optic infrastructure along the Central and Eastern Corridors. The Project will support the expansion of this network with an east-west link from the Eastern corridor at Yendi as well as linking the border post at Tatale. This new link will provide internet connection opportunities for all communities along the corridor.

An assessment study for the main road investment is underway and the pavement concept design would recommend the actual works and the associated need for land acquisition and resettlement to provide expected level of service. The study will review and recommend the horizontal alignment of the paved road between Tamale and Yendi to improve road safety and ease of travel for all users. The study would also determine the best alignment either through or around Yendi to reduce congestion and minimize the need for costly resettlement along the urban section and determine technically viable pavement solution for the unpaved road between Yendi and Tatale to the Togo border. *Figure 4.2*, below, shows the alignment of the Tamale-Yendi-Tatale road and the communities it connects.

Figure 4.2: Tamale-Yendi-Tatale Road Alignment

³ The GHA recently upgraded the section west of Tamale with support from the African Development Bank.



Source: MRH

This sub-component will finance the following activities;

- (a) Consulting services to undertake the assessment study and develop the bid documents for the Tamale-Yendi-Tatale road link.
- (b) The Asset management works contract and monitoring services for the improvement of the Tamale-Yendi-Tatale road link.
- (c) Support to the axle load control program with the procurement of equipment for two permanent weigh stations at Akatsi and Jema stations and four additional portable axle weighing units.

Sub-Component 1.3: Improved Asset Management of the Feeder Road Network (Managed by Department of Feeder Roads (DFR)):

The project will support the improvement/rehabilitation and longer term maintenance, carried out under performance-based contracting principles, of about 150-250 km of Feeder and Farm Roads in a prioritised geographical area in the northern part of Ghana. The final length and locations will be determined based on the actual works inputs required.

The Feeder / Farm roads carry very low volume of traffic (<50 vehicles per day) and the final pavement design is expected to be gravel road standard.

The prioritisation methodology firstly determined, for each of the Northern, Brong Ahafo, Upper East and Upper West Regions, the districts with the highest poverty incidence based on the 2014 Household Survey.

Secondly, the influence areas of all active agricultural value chains were overlain on the poverty maps. The Government has several agricultural support programs funded by, among others, IFAD, EU and World Bank. The Ghana Agriculture Sector Investment Program (GASIP) is developing support programs for these existing active value chains. These active value chains include areas where farmers have agreements with specific producers to purchase their produce. While other interventions will deliver on-farm support, the Project will provide the much needed road network connectivity and mechanisms to sustain it over the longer-term.

The Project will support a comprehensive Socio-economic Impact Assessment of the longer-term support to the road sector and other GASIP-activities. This assessment study will include the development of an initial baseline, prior to the works contracts

commencing, and two surveys, one about one year and the second about three-four years after the initial rehabilitation works have been completed.

Component 2: Improved Road Safety (Estimated cost US\$8 million):

This Component will support the activities to be implemented by both the National Road Safety Commission (NRSC) and the Driver and Vehicle Licensing Authority (DVLA).

Sub-Component 2.1: Supporting the National Road Safety Commission (NRSC)

The NRSC is the lead agency for road safety in Ghana, established by Act of Parliament in 1999. The NRSC's 2015-2017 action plan gives high priority to pedestrian safety as well as bus and heavy goods vehicle safety interventions, reflecting the high numbers of deaths and serious injuries associated with these road users. In 2014 there were 1,836 deaths on the roads in Ghana, some 40% being pedestrians and 23% of the total pedestrian deaths were children under 16 with the initial 2015-data showing a similar trend.

This sub-component will comprise the following set of activities approximately half of which will directly support NRSC and the remainder will be linked to the road safety activities of the roads agency components in the project:

- (a) *Road Accident Database Management System (RADMS);*
- (b) *Lollipop-program at about 500 schools (making pedestrian road crossings safer);*
- (c) *Training Needs Assessment; and*
- (d) *Other Activities agreed for support.*

Sub-Component 2.2: Supporting the Driver and Vehicle Licensing Authority (DVLA)

The sub-component will finance the following activities;

- a. *Rollout of vehicle inspections to Private Garages;*
- b. *Establishing an Integrated software Driver and Vehicle Licensing System;*
- c. *Institutional Strengthening.*

Component 3: Institutional Strengthening and Capacity Building (Estimated cost: US\$ 15 million):

Government has a general vision to modernise the transport sector in general and the Road Sub-sector in particular to improve the management efficiency of the respective Road Agencies in response to the increasing demands for reliable road infrastructure. The MOT and MRH will coordinate the agreed activities to assess the status of transport sector management in Ghana. These findings will identify opportunities to improve the management of the road sub-sector through internal reforms and potential restructuring of the current agencies and ministries.

GoG is undertaking a Public Expenditure Institutional Review (PEIR) of the Sector: This study will review the performance of the transport sector agencies in utilizing public funds and will review the efficiency of the sector in its planning and implementation of programs. The output of this study is a building block for the review of the National Transport Policy and the development of the NMMTMP.

Sub-Component 3.1: Institutional Strengthening (Estimated Cost US\$8.4 million)

The Project will support the following activities:

- (a) *Review of the National Transport Policy (2008)*;
- (b) *Institutional Review of the Road Sub-Sector Agencies*;
- (c) *Support Road sub-sector Reforms*;
- (d) Development of a *National Multi-Modal Transport Master Plan for Ghana (NMMTMP)*;
- (e) Assist the MOT to implement and operationalize a comprehensive, nationwide *Transport Sector Monitoring and Data Management System*; and
- (f) *Ghana Tolling Policy review*.

Sub-Component 3.2: Support Capacity Building (Estimated Cost US\$1.6 million)

Capacity Building: The project will support limited capacity building across the different Agencies benefitting from the program. This will include a mix of short-term international and local courses as well as specific, agreed post-graduate training programs, if considered essential. The agreed approach will be for the MRH/MOT to prepare an Annual Training Program for review and agreement by World Bank. Once agreed, the respective Agencies will implement the program.

Sub-Component 3.3: Project Implementation Support (Estimated Cost US\$5 million):

This Component will provide for technical assistance, equipment, training and operating costs for:

- a. Project management and implementation oversight;
- b. Project monitoring and evaluation; and
- c. Operating costs of the Project Office including the three AITs.

Project implementation support will specifically include implementation of citizen engagement (CE) mechanisms and HIV/AIDS and gender- targeted activities as following:

- (a) Behavior change and awareness raising interventions on HIV/AIDS and STD-prevention among beneficiary communities to both increase knowledge of HIV/AIDS and STD and to reduce HIV-affected people's discrimination and stigma;
- (b) Awareness raising and behavior change interventions on GBV among female and male beneficiaries to minimise GBV, address masculinity issues and promote new and more constructive male identities. This will include trainings on GBV prevention, care and report mechanisms to community health workers;
- (c) Increase the use of community monitoring committees in each beneficiary community to bring back citizens' ownership on project development and implementation as well as to promote a constant dialogue and collaboration between communities, Government and campsite workers; and
- (d) *Ad hoc* mechanisms allowing beneficiaries to report any questions and concerns associated with project's development and including these in the grievance redress system.

The estimated total project cost is US\$150 Millions and will be fully financed with IDA resources. Government will not provide counterpart funding for the project. The costs

include all taxes as well as the cost of resettlement activities associated with the works activities.

4.2. TSIP Management and Implementation

The MRH will have overall responsibility for project implementation. To facilitate smooth implementation, MRH will develop a Project Implementation Manual (PIM), that will include: (a) institutional coordination and day-to-day execution arrangements of the project; (b) disbursement and financial management; (c) procurement; (d) implementation of environmental and social safeguards; (e) monitoring, evaluation, reporting and communication; and (g) such other administrative, financial, technical and organizational arrangements and procedures as may be required for the project.

A mainstreamed structure has been adopted by GoG for the project consisting of (a) a Project Steering Committee (PSC); (b) a full-time Project Coordinator (PC); and (c) three Agency Implementation Teams (AITs) headed by full-time managers and complimented by additional full-time or part-time staff, as implementation requires.

The PSC is responsible for reviewing and approving the project's annual work plans and budgets, providing policy and program guidance to the PC, and ensuring communication and cooperation among stakeholders. The PSC will be co-chaired by the Directors of Planning of the MRH and MOT and will include officials from the MRH, MOT, MOF, MOFA, GHA, DUR, DFR, DVLA and NRSC. It is expected to meet on a regular basis (quarterly) and, at any other time should the project require it.

The PC is responsible for coordinating and implementing the project activities and will be selected competitively and be appointed by MRH and MOT. The PC will report directly to the PSC and will be supported by a project office adequately staffed and housed in the MRH. The PC will be responsible for the overall coordination of the project subcomponents. More specifically, he will: (a) lead the preparation of annual work plans and budget for the project for consideration and approval by the PSC and clearance by the World Bank; (b) coordinate the procurement actions taken by the three AITs for all agreed activities; (c) ensure that the agreed implementation schedules are followed by the AITs; (d) provide overall management of the financial accounts of the project, including external financial audit; (e) arrange independent technical audits of the works under the project and procurement audit of all components of the project; (f) prepare and distribute aggregated quarterly and six-monthly implementation progress reports for all project stakeholders; (g) consolidate agency project updates for review by implementation support missions by the World Bank; and (h) lead the preparation of a mid-term review report and the Implementation Completion Report (ICR) with assistance from the Implementing Agencies (IAs), Beneficiary Agencies (BAs), key stakeholders and World Bank.

The three AITs will report to the PC in all matters of project implementation, coordination and reporting. They will assist the PC with project implementation and will, amongst others, be responsible for; (a) preparing AIT annual work plans, procurement plans and budget as part of the project's annual work plans and budgets; (b) providing progress updates in the course of project implementation; (c) implementing the procurement process and deliverables including liaison with agency entities (formally constituted procurement committees required under Ghana Law) to secure procurement clearances and payment for eligible project activities; (d) quality control of procurement related activities and assessment of suppliers outputs including evaluation of technical (design and specifications); (e) ensuring compliance of agency

activities with World Bank fiduciary policies (including environmental and social safeguards), in liaison with relevant agency departments; (f) quarterly reporting on the progress of agency activities; and (g) preparing ad-hoc project updates on agency components for review by the PC.

The three AITs are: MRH, also responsible for the DFR; Ghana Highway Authority (GHA); and MOT, responsible for the DVLA and the NRSC. Table 4-1 below summarises the areas of responsibility for the respective AITs. The Beneficiary Agencies (BAs), which will be responsible for providing technical inputs to the AITs during implementation, are the Ministry of Food and Agriculture (MOFA), Motor Transport and Traffic Department (MTTD) and the Local Assemblies responsible for the farm roads works. The BAs will provide technical and implementation inputs to the AITs. *Table 4-1*, below summarizes the assignment of AITs.

Table 4-1: Summary of Assignment of Implementation Teams

Component/Subcomponent	Agency Implementation Team (AIT)
1.1 Road Asset Management System	MRH
1.2 Improved Asset Management on the Trunk Road Network	GHA
1.3 Improved Asset Management on the Feeder Road Network	MRH
2.1: Supporting the National Road Safety Commission (NRSC)	MOT
2.2: Supporting the Driver and Vehicle Licensing Authority (DVLA)	MOT
3: Institutional Strengthening and Capacity Building	MRH, MOT, GHA

During project implementation, the PC will arrange monthly implementation meetings with AITs to review progress and address any implementation-related issues. The monthly reports will be aggregated into a quarterly report to be submitted to the PSC for discussions and critical decision making on the project.

All components will be managed in line with World Bank fiduciary and safeguards requirements. In those areas where expertise is lacking, short-term consulting specialists (contract management, engineering, procurement, financial management, environmental and social safeguards management) will be employed to enhance performance and project implementation. The short-term specialists would be financed as part of the capacity building component of MRH and MOT.

4.3. OPRC in the TSIP

Under the OPRC, during the bidding process, contractors compete amongst each other by proposing a fixed lump-sum for bringing the road to a certain, specified level of service and then maintaining it at that level for a relatively long period. The contractors are not paid directly for "inputs" or physical works, but for "outcomes," i.e., the initial rehabilitation of the road to pre-defined standards, the maintenance service of ensuring certain quality levels on the roads under contract and specific improvements. Irrespective of the amount of works carried out, the Contractor's monthly payment remains the same as long as the required service levels are complied with.

To operationalize the works under OPRC, the Client (GHA/DUR/DFR/MRH) will employ the services of a qualified consulting firm to undertake an assessment study that would include, amongst others, collection of baseline engineering and other data of the identified road network links; preparation of the concept design, preparation of environmental and social reports (ESIA and RAP) of the identified roads (based on ESA, ESMF and RPF), cost estimate, bidding and pre-qualification documents as well as support the Client with the procurement of the OPRC contracts. The Contractors would bid on the works based on the concept design, bid documents, and the environmental and social reports (ESIA, RAP and RPF). The successful Contractors would update Environmental and Social Impact Assessment (ESIA), and prepare Environmental Management Plan (EMP) and a Resettlement Action Plan (RAP) based on the agreed engineering design. These documents will be submitted to the Client and the Bank for review and clearance.

Learning from experience with other Bank-funded road projects in Ghana, the project will focus on early execution of land acquisition and implementation of Resettlement Action Plans (RAPs) before the start of the construction works, in order to avert project implementation delays and promote timely completion. These measures include:

- 1) During the assessment study, GoG will implement the RAP based on the concept design. The works contractor will then only have to update the RAP to incorporate any changes based on differences between the final and concept designs. This approach will clear significant sections of road for commencement of works and will reduce the potential delays associated with slow implementation of the updated RAP.
- 2) GoG will fund the cost of resettlement based on the RAP. This upfront funding of resettlement costs will eliminate/minimize the delays in project implementation emanating from slow/late advancement of funds for compensation and resettlement payments which had bedevilled previous road projects in Ghana.

The Contractor will not be allowed to proceed with the implementation of the works / sub projects until the Contractor's Environmental Management Plan (C-EMP) specific measures, environmental health and safety measures and rules, and all environmental and social clause have been cleared and the RAP has been successfully implemented. To assist with the monitoring of the implementation of these contracts, the Client will employ Monitoring Consultant(s) for the duration of the OPRC contracts.

One of the main contract features would include: (a) each contract specifies the minimum rehabilitation solution; (b) the contractor carries out (detailed) engineering design for the rehabilitation works; and (c) the lump-sum based contractual payment (to motivate the contractor's efficiency and accountability). The achievement of the OPRC objectives would be monitored by the following performance measures: (a) consistency and constancy of road quality; (b) road user safety standards corrective and preventive maintenance; (c) maintaining standard road and contract operating procedures; and (d) environmental and social performance.

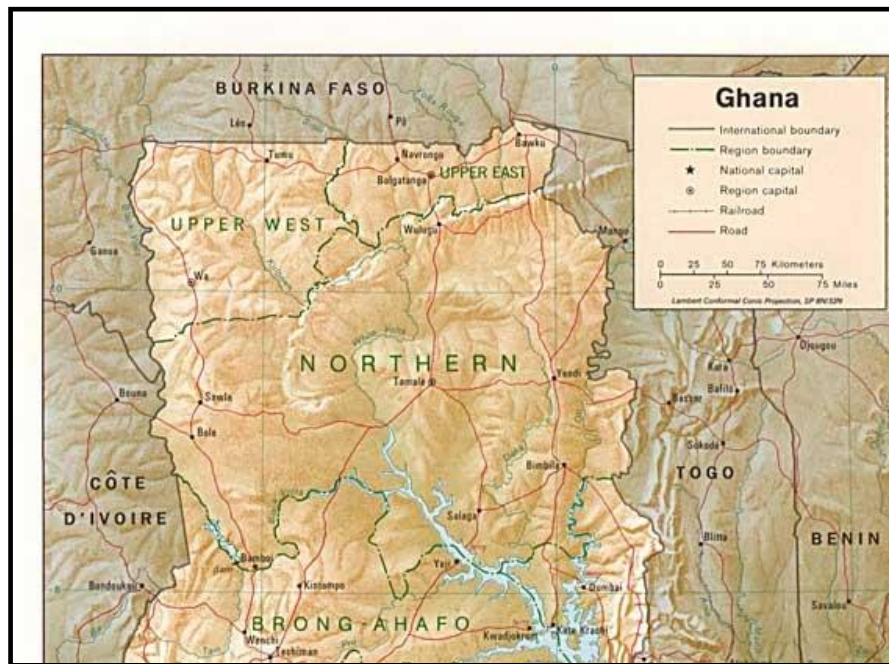
5.0 DESCRIPTION OF BASELINE CONDITIONS

This section describes natural resources, social and climatic conditions as well as land form, land use and related characteristics that have relevance or implications for the rehabilitation/reconstruction of the Tamale-Yendi-Tatale and the selected feeder road development within the Brong Ahafo, Northern, Upper East and Upper West regions of Ghana.

5.1. Ecosystem Characteristics

The Tamale-Yendi-Tatale corridor and the regions where the feeder roads projects are planned falls within the general woodland Savanna ecosystem type in Ghana. The topography is gently rolling with average height of the plain ranging between 180m and 300m above sea level. Small rounded hills composed mainly of granite are scattered on this plain (Dickson and Benneh, 1988). A generalized relief map of the locations of the TSIP operations is shown in *Figure 5.1*, below. The generally flat terrain is characterized by subsurface hard pans. Vegetation is mainly woodland savannah. This comprises of a mixture of trees, shrub and tall grass species. The trees and shrub matrix may form a light canopy often less than 15 m high (Grimes 1987). There is intermittent riparian vegetation or fringing forest along water courses.

Figure 5.1: Generalized Relief Map of TSIP Regions

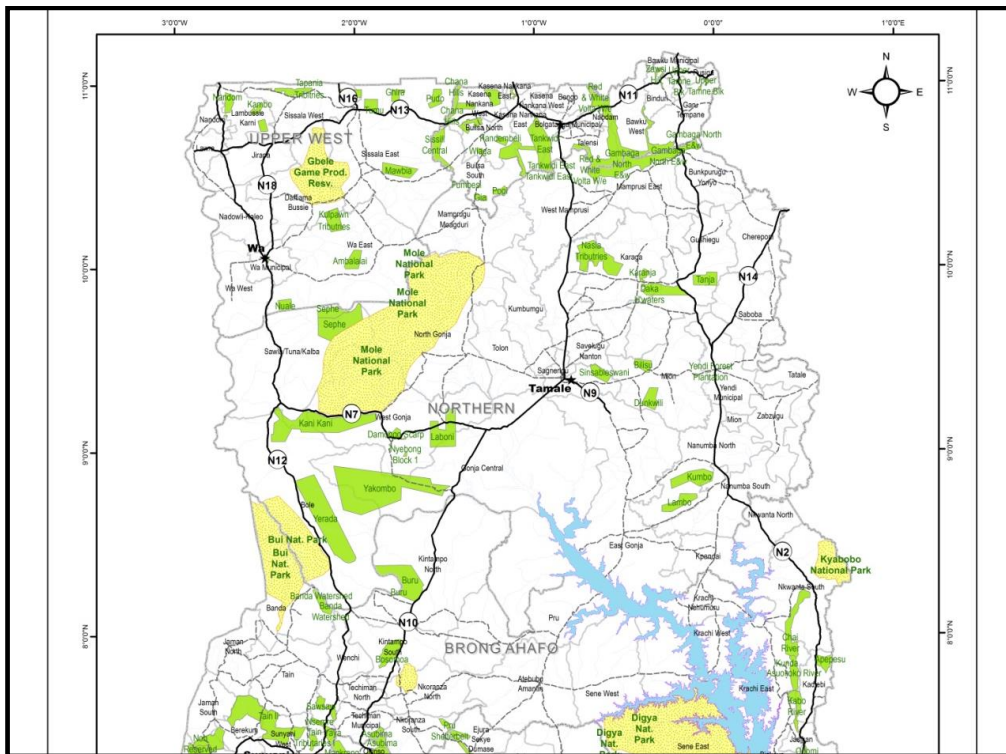


With respect to the Tamale-Yendi-Tatale road, there are three forest reserves along the corridor. These are the Sinsablegbini, Gunkwibi and Biligu forest reserves. The reserves were established primarily to protect the headwaters of various tributaries, prevent soil erosion as well as to ensure the provision of thatch and poles for local housing needs. Other uses include plantations for fuel wood, fire protection, prevention and control. These reserves are classified as Savanna woodlands with 5-25 percent canopy cover. Typical of the forest reserves found in the area, parts of the Sinsablegbini reserves have been converted into plantation of various exotic species, notably Teak and Eucalyptus.

Recurrent wild fires are prevalent in the general landscape and occurs annually devastating villages, destroying crops and damaging the general landscape.

The reserves are completely surrounded by predominantly farming communities most of which are situated right at the boundaries with high dependence of the surrounding communities on the reserves, for firewood. Hunting pressure and human activities in the reserves are high. Besides hunting and collection of fire wood, local communities also graze their cattle in the reserves. Figure 5.2, below, shows a map of protected areas and primary and secondary roads in the northern parts of Ghana.

Figure 5.2: Protected Areas and Road Network in Northern Ghana



Source: CERSGIS, University of Ghana, Legon

For the purposes of the proposed project, it will be necessary to benchmark certain parameters of the ecosystem on the project corridor. This will assist in monitoring the selected parameters during the project implementation and operation phases to determine the scope and magnitude of any impacts - positive or negative that the project may have on its environs. The environmental and social parameters would be updated after the final design. In this regard, the following should be considered during the preparation of project-specific ESIA after the selection, siting and final concept design of the feeder and other roads is completed:

1. Identification of ecosystem classifications of the proposed project site
2. Description of the current ecosystems including climatic, topographic and geologic characteristics
3. Identification of baseline biodiversity information from an assessment of fauna and flora including identification of dominant species and the presence or absence of endangered species (based on national and international classifications)
4. Identification of the major topographical features along the corridor in relation of biological diversity

5.2. Drainage and Water Resources⁴

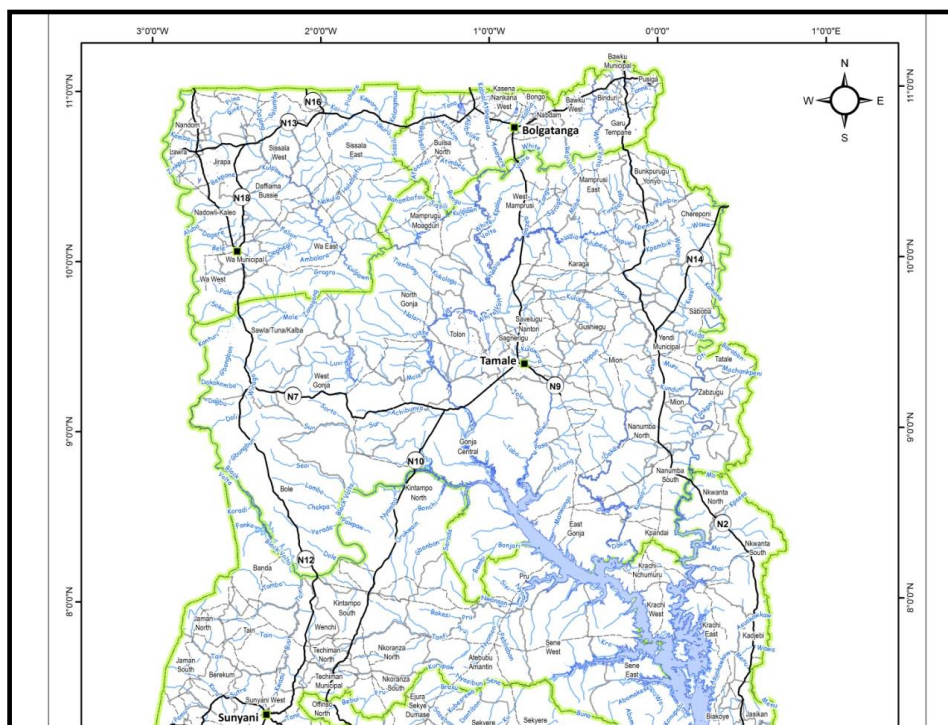
Ghana is well endowed with water resources, but the amount of water available changes markedly from season to season as well as from year to year. Also the distribution within the country is far from uniform with the south-western part better watered than the coastal and northern regions. However, availability of water is decreasing owing to rainfall variability (climate change), rapid population growth, increased environmental degradation, pollution of rivers and draining of wetlands.

River System and Ground Water

All of Ghana's rivers drain southwards to the Gulf of Guinea. The Volta River, with a catchment area within Ghana of nearly 70% of the country, is by far the largest river draining the entire north, centre and east of the country. The Tamale-Yendi-Tatale road and the TSIP feeder roads are all located within the Volta Basin. The remaining rivers, all in the south and southwest, drain about 30% of the country.

The major sub-basins of the Volta include the Black and White Volta Rivers, the Oti River and the Lower Volta, including Lake Volta. The Volta River basin is shared with Cote d'Ivoire, Burkina Faso, Togo, Benin and Mali. Figure 5.3, below, depicts a map of the major roads and major river systems in the TSIP focus regions.

Figure 5.3: River System in the TSIP Focus Regions



Source: CERGIS, University of Ghana, Legon

The occurrence of groundwater in Ghana is associated with 3 main geological formations. These are the basement complex, comprising crystalline igneous and metamorphic rocks; the consolidated sedimentary formations underlying the Volta

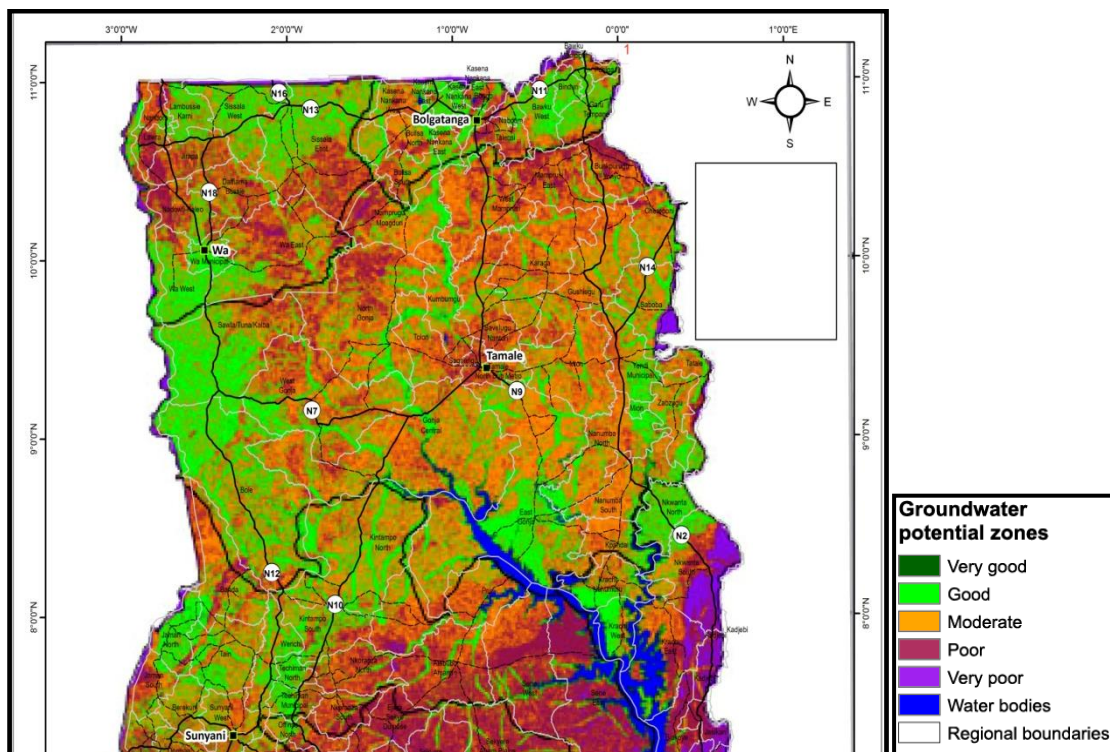
⁴ Source: National Integrated Water Resources Management (IWRM) Plan, 2012 (Water Resources Commission) and Dickson and Benneh (1988).

basin (including the limestone horizon); and the mesozoic and cenozoic sedimentary rocks. The basement complex and the Voltaian formation cover 54 percent and 45 percent of the country respectively. The remaining 1 percent consists of mesozoic and cenozoic sediments.

Groundwater occurrence in the basement complex is associated with the development of secondary porosity as a result of jointing, shearing, fracturing and weathering. The depths of aquifers are normally between 10 m and 60 m, and yields rarely exceed 6 m³/hr. In the mesozoic and cenozoic formations occurring in the extreme south eastern and western part of the country, the aquifer depths vary from 6 m to 120 m. There are also limestone aquifers, some of which are 120 m to 300 m in depth. The average yield in the limestone aquifers is as high as 180 m³/hr. In all, the total actual renewable water resources are estimated to be 53.2 billion m³ per year. All recharge to water resources is precipitation.

The quality of groundwater resources in Ghana is generally good except for some cases of localised pollution and areas with high levels of iron, fluoride and other minerals. Salinity in certain groundwater occurrences is also found especially in some coastal aquifers. Figure 5.4 depicts a map of the Ground Water Potential Zones in Ghana.

Figure 5.4: Ground Water Potential Zones in Focus Regions



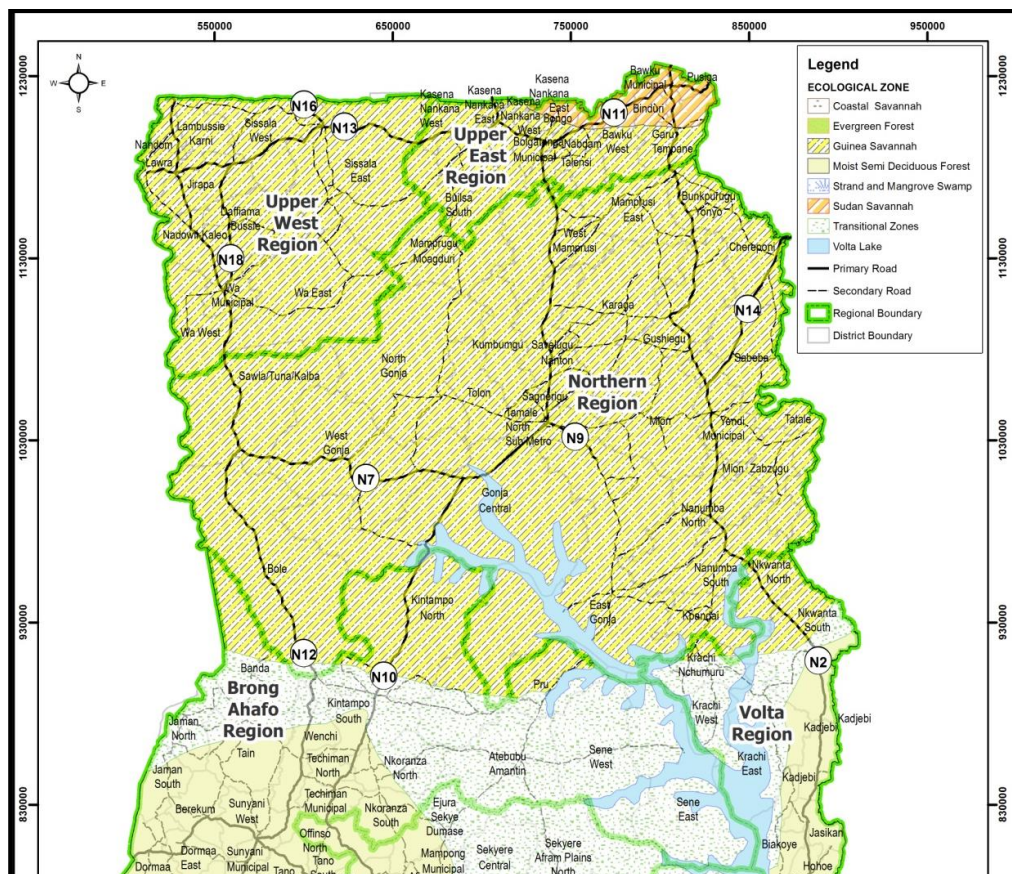
The above characteristics of water bodies in Ghana implies that any disturbance of water quality resulting from road construction and road use could exert potentially detrimental effect in the northern half during the long dry season. The characteristic widespread seasonal flooding requires careful route selection, proper drainage or the need to elevate the base of roads significantly above the general elevation of the neighbouring land.

5.3. Climate

Using the average characteristics of rainfall, temperature and humidity for a period of 25 – 30 years, Ghana can be classified into four main climatic regions. These are the South-western Equatorial Climatic Zone, Dry Equatorial Climatic Zone, Wet-semi Equatorial Climatic Zone and Tropical Continental (Savannah) Climatic Zone.

The Tamale-Yendi-Tatale road and the TSIP feeder roads fall within the Tropical Continental (Savannah) Climatic Zone. This climatic region, unlike the three others has a single rainy season which starts in May and ends in October, followed by a prolonged dry season. Mean annual rainfall of between 100 and 115cm is recorded. Mean annual temperatures vary from about 36°C in March to about 27°C in August. Relative humidity of between 70 and 90% may be recorded during the rainy season, but may fall to as low as 20% during the dry season. The zone between the wet-semi equatorial region and Salaga, however, experiences a modified form of the typical interior Savannah and the wet-equatorial climatic. Here a double maxima rainfall regime is experienced, recording mean annual rainfall of between 115 and 125cm. here, the first season (May to June), is rather the minor season. Mean monthly temperatures range from 30°C in March to about 24°C in August. Higher relative humidity of 90 to 95% and 75 to 80% are recorded in the rainy seasons respectively (Benneh and Dickson, 1988). Figure 5.5 depicts the Climatic Zones Map of Ghana.

Figure 5.5: Climatic Zones of TSIP Focus Regions



Source: CERGIS, University of Ghana, Legon

Table 5.1: Summary of rainfall characteristics in the different climatic zones

Climatic zone	Rainfall characteristics	Impact of Rainfall characteristics on road construction
Wet Semi Equatorial	*Double maxima rainfall regime: -May to June -September to October *Mean annual rainfall is 125cm *Akwapim -Togo ranges however, records average annual rainfall of over 165cm	Road construction between the months of May and June would be problematic. Movement of heavy and noisy construction machinery in zone of the Akwapim Togo Ranges could cause landslides (and mudslides during the rainy season)
Tropical Continental (Savannah) Climatic Zone	*Single rainy season : May to October *Mean annual rainfall is between 100cm and 115cm	Long dry period (November to April) gives enough ideal time for road construction. Though rainfall amount is relatively low, the existence of the iron pan implies that relatively small amount of rainfall could still cause flooding.

5.4. Climate Change and Resilience

Several studies have been undertaken to reveal climate trends in Ghana. Findings suggest that overall Ghana is projected to become hotter, with projected overall annual temperatures increasing between 1 to 3°C by 2060; wetter during the wet season and drier during the dry season, with a greater rainfall variability and intensity. However the overall annual rainfall is expected to decrease by 20.5% by 2080, exacerbating droughts. Moreover, increase in sea level rise up to 34.5 cm in 2080 and storm surges are expected.

Geographical distribution of climate changes indicates that the North of Ghana is likely to encounter a hotter and possibly drier climate, while the south is likely to face a hotter future with higher rainfall variability and intensity. This difference in climate patterns over the country can have important implications on migration to the capital.

The National Climate Change Policy (NCCP) is Ghana’s integrated response to climate change. The Government of Ghana recognizes that climate change must be mainstreamed into policies and sectoral activities to achieve sustainable growth. As such, the vision outlined in the NCCP is: to ensure a climate-resilient and climate-compatible economy while achieving sustainable development through equitable low carbon economic growth for Ghana. Climate change issues are already being addressed and mainstreamed into activities by a number of existing national institutions, such as the ministries including the MRH, nongovernmental and civil society organizations and the private sector, and bi-lateral and multi-lateral donor partners.

Climate change and resilience is very critical for the road sector as future climate changes could affect transport modes and system components. Extreme weather events can damage roads and bridges and cost large sums to repair, not to mention the cost to the economy from disrupted travel. If such impacts are not anticipated in future road transport infrastructure design and maintenance, those changing weather conditions could, in some regions, accelerate their deterioration, increase severe damages risks, traffic interruption and accidents which could, on their turn, affect economic activities.

It is important for the road and transport sector to undertake climate change vulnerability assessments using vulnerability assessment frameworks; integrating climate change, resilience and sustainability in road and transportation planning

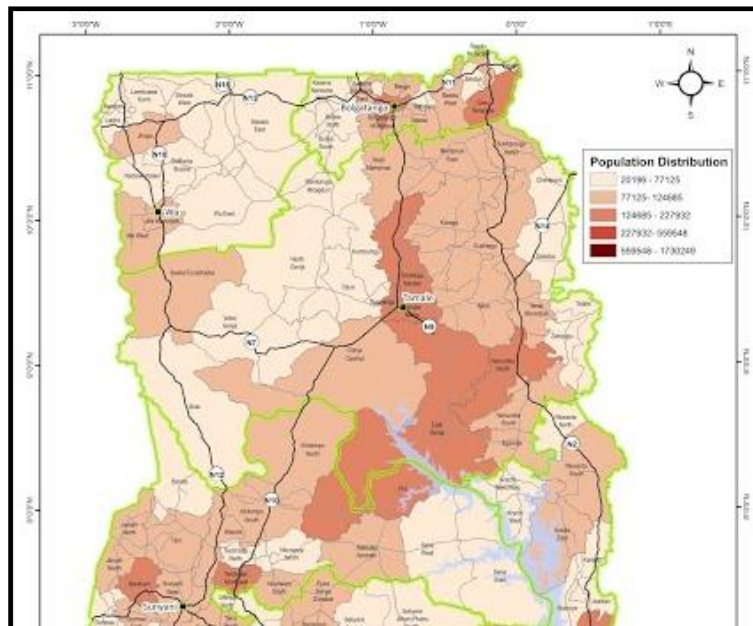
process; incorporating climate risks into road design and asset management (risk-based asset management); following operations and maintenance strategies that can also lessen climate impacts on transportation (examples include more frequent cleaning of storm-drains, improved plans for weather emergencies, closures and rerouting, traveller information systems, debris removal, early warning systems, prepositioning materials, damage repairs, and performance monitoring).

5.5. Population and Socio-economic Conditions

5.5.1. Population Distribution

Ghana has ten administrative regions. The September 2016 projected total national population is approximately 28.3 million people.⁵ The distribution of the population across the country is highly uneven. The Upper East (4.2%), Upper West (2.8%), and Northern Regions (10.1%), all of which can be found in the Savannah zone together have 17.1% of the total population (these together with the Brong Ahafo Region are the TSIP target regions). The Ashanti Region and Brong Ahafo Region which lies in the middle belt have 19.1% and 9.4%, respectively. Greater Accra Region, with the national capital and lying in the dry equatorial climatic zone has 16.3%. The Western Region has 10.1%, while the Volta, Central and Eastern Regions have 8.6%, 8.6% and 10.7% respectively. Figure 5.6, below, depicts population distribution in the TSIP focus regions.

Figure 5.6: Population Distribution Map of TSIP Focus Regions



Source: CERSGIS, University of Ghana, Legon

The estimated number of households in Ghana is 6.6 million according to the Ghana Living Standards Survey 6 (GLSS 6), 2014. The mean household size for the country is 4 compared to 4.4 obtained from the 2010 Census. Average household sizes that are higher than the national average are found in the three northern regions (5.5 for Upper West, 5.4 for Northern and 4.5 for Upper East) and in Volta and Brong Ahafo regions (each with a mean household size of 4.3 each). GLSS 6 further reveals that in general

⁵ Source: Data Production Unit, Ghana Statistical Service, 16th September, 2016

rural (4.5) household size is larger than urban (3.6) household size. Rural Savannah has the highest mean household size of 5.5, while rural coastal has the least (3.8).

The pattern of population distribution and density do not necessarily reflect road network density, except that construction of roads within high population centres carry greater liabilities and public health risks, especially in urban centres, than in sparsely populated rural communities.

5.5.2. Health

The distribution of health facilities appears skewed in favour of regions in the southern sector. However, by virtue of the relatively low population densities of the northern half of the country, the population per facility ratio shows fairly equitable distribution. The Greater Accra and Volta Regions have the lowest population per facility while Central, Eastern, and Northern regions have the highest population per facility ratio. However, by reason of proximity of the Central and Eastern Regions to Accra, the Northern Region may be considered the most disadvantaged in comparison.

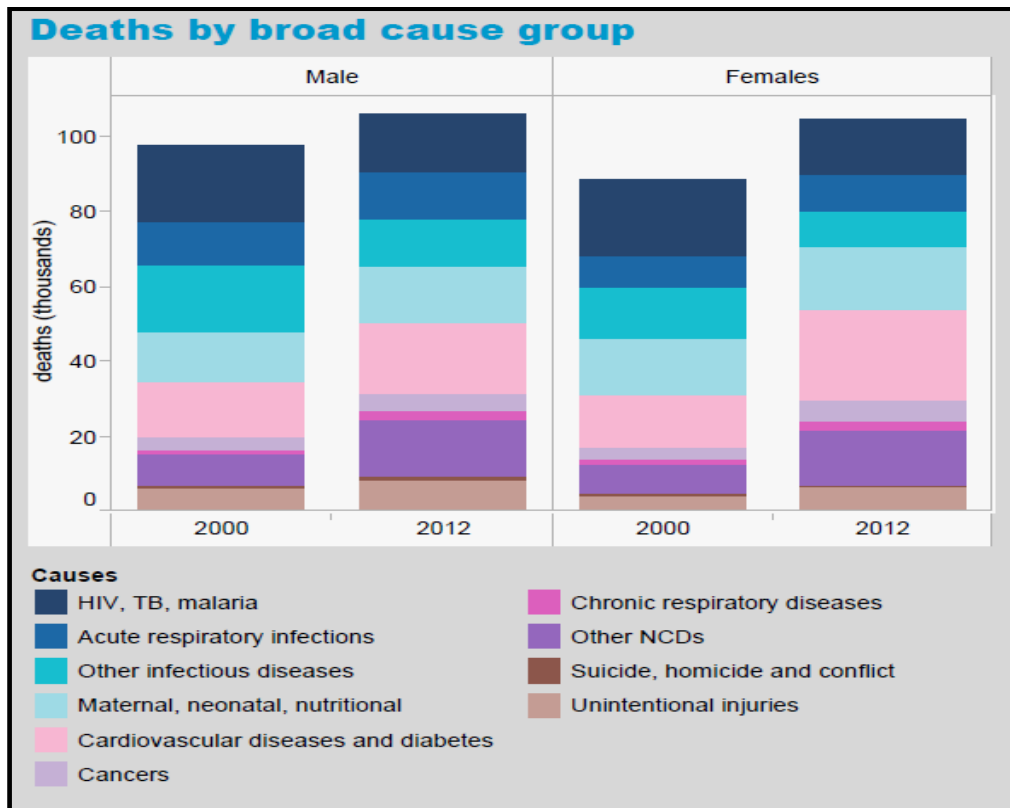
Road construction results in air pollution which affect the health of people exposed. Table 5-2 and Figure 5.7 indicate that respiratory tract infections (RTIs) are among the commonest causes of deaths in Ghana. The main sources of particulate emission that give such high ranking for RTIs include road construction and unpaved road use (also motor vehicle emissions, industrial pollution, charcoal burning, etc.). This calls for strict environmental management practices to suppress dust generation, especially during road construction in order not to aggravate the situation. Pits and trenches left abandoned and unfilled, and inadequate or lack of drainage after road construction allow rainwater and run-off to collect in such depressions and pits. These become good breeding ground for mosquitoes, which cause malaria and other ailments. Communities along such road corridors become exposed and suffer higher incidence of malaria, which is the leading cause of out patients' visits and mortality in Ghana.

Table 5.2: Top 10 Causes of Death in Ghana

Top 10 Causes of Death in Ghana			
1. Malaria	13%	6. Ischemic Heart Disease	5%
2. Lower Respiratory Infections	9%	7. Sepsis	4%
3. HIV	9%	8. Protein-Energy Malnutrition	3%
4. Stroke	8%	9. Road Injuries	3%
5. Cancer	6%	10. Meningitis	3%

Source: GBD Compare (<http://viz.healthmetricsandevaluation.org/gbd-compare/>), 2010

Figure 5.7: Deaths in Ghana by Broad Cause Group



Source: Ghana: WHO statistical profile <http://www.who.int/gho/countries/gha.pdf?ua=1>

HIV/AIDS

Information about HIV/AIDS awareness of the population is critical for road sector projects. This is because of the influx of large numbers of people into project locations and the associated hazards of exposure to all kinds of deviant sexual behaviors. Results of the GLSS 6 indicates that, overall, 6.2 percent of people in the country “do not know” that a healthy looking person may have HIV. More than four out of every five persons are aware that a healthy-looking person can have HIV while 7 percent have no idea. Awareness is lowest among those in the Northern region (72.5%) but very high among people in Greater Accra (92.7%) and Ashanti (92.6%) regions.

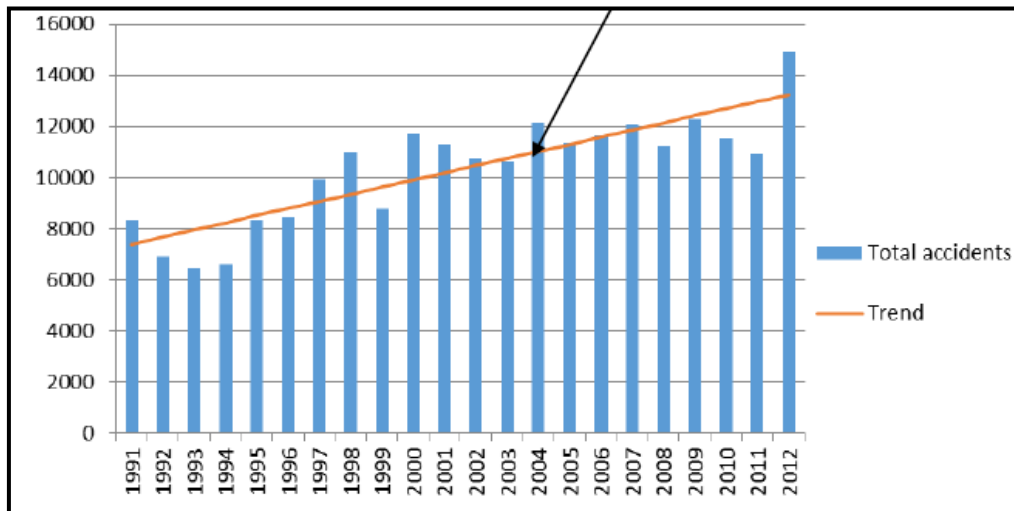
GLSS 6 further indicates that among the localities, knowledge is higher in urban (90.5%) than in rural areas (82.7%); with awareness being higher in Accra (GAMA) than other urban areas, and higher in rural forest and rural coastal than in rural savannah.

Results from the 2014 Ghana Demographic and Health Survey (GDHS) indicate that 2.0 percent of Ghanaian adults are living with HIV. HIV prevalence in women age 15-49 is 2.8 percent, while for men 15-59 it is 1.1 percent. The HIV gender ratio of three to one (female-to-male) is higher than that found in most population-based studies in Africa. The high female-to-male ratio implies that young women are particularly vulnerable to HIV infection compared with young men. Prevalence is consistently higher among women than among men in all age groups. At the same time, HIV prevalence shows an age pattern among women and men: prevalence generally increases with age, leveling off after age 44. The peak prevalence among women is at age 40-44 (5.4 percent), while prevalence rises gradually with age among men to peak at age 35-39 (2.7 percent).

Road Safety

Road traffic injuries constitute a major but neglected public health and development crisis that require more focused efforts for effective and sustainable prevention (WHO, 2004). In Africa and particularly in Ghana, mortalities and morbidities associated with road transport injuries are most often among pedestrians, passengers, cyclists, users of motorized two-wheels, and occupants of buses and mini buses (National Road Safety Commission, 2008 and Lopez et al., 2001). In Ghana, statistics show that between 2002 and 2008, 13,166 people were killed in road accidents. Of that figure, 42% were pedestrians, 23% were passengers in buses, and 12% were car occupants, while the remaining 23% consisted of riders (National Road Safety Commission, 2008). Road transport accidents have been identified to contribute 3% of deaths in Ghana annually (refer to Table 5.2, above). In 2012 alone, 2,249 Ghanaians lost their lives while 14,169 got injured through RTA and were mostly from the active labour force and predominantly those between the ages of 30-49 years (NRSC 2012). According to the latest WHO data published in May, 2014 road traffic accidents deaths in Ghana reached 5,540 or 2.96% of total deaths⁶. Figure 5.8, below, depicts the number of road traffic accidents (RTA) and trend.

Figure 5.8: Trends of Road Traffic Accidents, 1991 - 2012



Source: National Road Safety Commission, 2012

5.5.3. Education

Statistics on educational attainment help in knowing the present educational levels of the adult population as well as availability of skilled manpower for various types of economic activity. Results of the Ghana Living Standards Survey Round 6 (GLSS 6), 2014 indicates that nearly one-fifth of the adult population (19.7%) has never been to school while 44.6 percent have attained a level below Middle School Leaving Certificate (MSLC) or Basic Education Certificate Examination (BECE). About 21 percent of the population has MSLC/BECE and only 14.7 percent have acquired Secondary/Senior Secondary School (SSS) or Senior High School (SHS) or a higher level of education.

⁶ <http://www.worldlifeexpectancy.com/ghana-road-traffic-accidents>

GLSS 6 further indicates that there is disparity in educational attainment between the sexes. The proportion of females who have never been to school (24.3%) is higher than for males (14.6%). On the other hand, the proportion of males (22.8%) who have attained MSLC/BECE/Vocational education is higher than the proportion of females (19.3%). The same pattern is observed at the Secondary/SSS/SHS and higher category where the level of attainment is higher for males (18.0%) than for females (11.7%).

Literacy is defined as the ability to read and write a simple sentence in English and any Ghanaian language with understanding. According to GLSS 6 the literacy rate in Ghana is 56.3 percent. The literacy rate for males (67.3%) is higher than for females (46.9%). There are substantial differences between rural and urban literacy rates. Whereas seven out of every 10 persons (69.6%) 15 years and older in the urban areas is literate, only about two out of every five (41.7%) of their rural counterparts are literate. A similar pattern is observed among male and females in the urban and rural areas of the country. Greater Accra (79.6%) and other urban (65.1%) have the highest literacy rates while the rural savannah area (30.0%) has the lowest; this is also true for males and females.

Road construction can positively or negatively impact access to education and create or reduce disparities in access and educational attainment levels. Road construction impacts the local economy through the generation of direct employment and other sources of livelihood for local people. It also provides / facilitates access to education. It is important for the baseline information on these socio-economic indicators to be known for a better impact assessment.

5.5.4. Employment

More than three-quarters of the population 15 years and older is economically active (77.1%) according to GLSS 6. Similarly, about 75.5% of the population 15 years and older are employed, 1.7 percent are unemployed and 22.8 percent are economically not active. Irrespective of sex, the population in rural areas (81.7%) is more likely to be employed than those in urban areas (69.9%). On the other hand, the population in the urban area is more likely than rural dwellers to be unemployed and economically not active. GLSS 6 further shows that for both urban and rural dwellers and irrespective of sex, children (5-14 years) are more likely to be economically not actively (75.1%).

Across Ghana, skilled agricultural or fishery workers constitute the largest occupational group with 44.3 percent of all persons 15 years older, followed by service or sales workers (24.5%) and craft and its related workers (12.7%). These three occupations together engage four out of every five (81.5%) currently employed persons in the country. The proportion of males is higher than females in the agricultural or craft related occupations. However, there is nearly four times the proportion of females (37.2%) than males (10.8%) in service or sales occupations. Not surprising, agricultural and fishery occupations are predominant in rural Ghana, engaging 70.7 percent of all workers. On the other hand, only one in six (16.5%) urban dwellers are agricultural/fishery workers with slightly more males (19.0%) than females (14.3%). The dominant occupation among urban females is service or sales work with nearly three out of every five (57.4%) currently employed females 15 years and older in this occupation. Among the urban males, however, craft and related workers dominate.⁷

⁷ Source: Ghana Living Standards Survey Round 6 (GLSS 6), 2014, Ghana Statistical Service.

The ILO Convention 138 (Minimum age convention, 1973) sets 15 years as the age below which children should not be engaged in any form of work. In 1998, Ghana enacted the Children's Act which prohibits children from engaging in any work that is exploitative or hazardous to the child's health, education, or development. There is evidence that children in Ghana, even as young as five years, engage in economic activities (Ghana Child Labour Survey, GSS, 2003), and this was confirmed by GLSS 6.

GLSS 6 results shows that, overall, 28.8 percent of children (5 – 14 years old) are currently employed and 70.1 percent are economically not active. As expected, the older children (10-14 years) are more likely than the younger children (7-9 years) to engage in some economic activity (35.4% and 18.0% respectively). On the contrary, younger children (7-9 years) are more likely than the older children (10-14 years) to be economically not active (81.1% and 63.2% respectively). The majority (91.2%) of the children are engaged in agriculture, forestry and fishing, followed by wholesale and retail trade (13.2%). The proportion of males (84.6%) engaged in agriculture, forestry and fishing is higher than females (71.2%).

By geographical location, the proportion of children in rural areas engaged in agriculture, forestry and fishing (88.2%) is higher than those in urban areas (51.8%). On the other hand, the proportion of children in urban areas engaged in wholesale and retail trade (29.8%) is nearly five times those in rural areas (6.7%). Very small proportions of children in the rural areas are engaged in mining and quarrying. In both urban and rural areas, the proportion of females engaged in wholesale and retail trade is higher than their male counterparts.

5.5.5. Income and expenditure

The annual average household expenditure for Ghana is estimated at GH¢9,317 with a mean annual per capita expenditure of GH¢3,117 according to GLSS 6. The total annual household expenditure is estimated at GH¢61,507 million with the share of urban expenditure (65.8%) almost twice as much as that of rural localities (34.2%). Moreover, the average household expenditure in urban localities (GH¢11,061) is about 1.5 times that of the rural localities (GH¢7,152). In the urban localities average annual household expenditure is higher in Accra (GAMA) (GH¢13,677) than in other urban areas. However, rural coastal areas have a slightly higher annual expenditure of GH¢ 7,663 compared to the rural forest areas (GH¢ 7,301).

The household's mean annual per capita expenditure on food (actual and imputed) of GH¢1,302 accounts for the largest share (46.7%) of the total annual household expenditure of GH¢61.507 million. Households total expenditure on housing accounts for 12.4 percent of total expenditure with an annual average of GH¢1,156 and an annual per capita expenditure of GH¢395.

The total annual income of Ghana is estimated at GH¢108,300 million according to results of GLSS 6. Urban households in the country have a mean annual income of GH¢74,893.45 million, representing 69.2 percent of the total national income while rural localities have GH¢33,406.63 million, representing 30.8 percent. GLSS 6 results further shows that among the rural localities, rural forest has the highest annual income of GH¢20,257.47 million followed by rural savannah (GH¢8,767.67 million), with rural coastal having the lowest (GH¢4,381.49 million).

The average annual household income for Ghana is GH¢16,644.59, with a mean annual per capita income of GH¢5,346.91 according to GLSS 6. The mean income of a

household in an urban locality is GH¢20,930.05 while that of rural is GH¢11,408.01. Among the urban localities, households in other urban areas have a higher average income compared to those in Accra (GAMA) while households in rural forest have the highest average income (GH¢12,102.59) among the rural localities. At the regional level, Ashanti has the highest average gross annual income of GH¢23,120 which is higher than the average national income of GH¢16,645. This is followed by the Western region and then Greater Accra. The three northern regions have the lowest mean annual gross income of less than GH¢13,000. In terms of per capita income, three regions (GH¢8,205.4 for Ashanti, GH¢7,730.7 for Western and GH¢5,428.5 for Greater Accra) have an annual per capita gross income above the national annual average (GH¢5,346.9), with Ashanti recording the highest. Seven regions recorded an average per capita annual gross income that is below the national average annual per capita income.

The major source of household income is from non-farm self-employment, contributing 48.3% to sources of household income. Wages from employment is the second major contributor to household income (36.3%) followed by household agriculture (10.1%). Income from rent, remittances and other sources contributes less than 5 percent to household income.

In the urban localities, the major source of income for households comes from non-farm self-employment which contributes 48.2 percent followed by wages from employment (28.4%). On the other hand, wages from employment (39.7%) is the major contributor to the income of rural households followed by non-farm self-employment (22.4%). In the regions, apart from Central and Upper East where wages from employment and other income are the major sources of income, all the other regions have non-farm self-employment as the major source of income followed by wages from employment. Only the Northern and Eastern regions have more than thirty percent of their income source from agriculture; all the other regions have less than 15 percent of their income from agriculture.⁸

5.5.6. Vulnerability Distribution

The proportion of male headed households (69.5%) is higher than that of females (30.5%); the proportion being much higher in rural savannah (83.6%) compared to rural coastal (61.9%). The proportion of female-headed households is higher in rural coastal (38.1%) than all other localities, with the lowest (16.4%) in rural savannah. The average age of a household head is 45.1 years with female household heads being older (48.0 years) than their male (43.8 years) counterparts. Children under 15 years account for 39.4 percent of the population while persons 65 years and older constitute 4.8 percent.

About 737,743 persons, representing 3.0 percent of the total population have some form of disability with females being the majority (52.5%) The regional distribution indicates that Volta Region (4.3%) has the highest proportion of population with disability, followed by Upper East (3.8%), Eastern (3.6%) and Central (3.4%) Regions. Brong Ahafo (2.3%) has the lowest proportion of persons with disability. Visual or sight impairment (40.1%) is the most common disability, followed by physical challenges (25.4%), emotional/behavioral problems (18.6%) and intellectual malfunctioning

⁸ Source: GLSS 6, 2014. Ghana Statistical Service

(15.2%). Visual or sight impairment is also the most common form of disability among both males (38.0%) and females (42.0%).

The road sector is making efforts to ensure that maintenance and development projects provide adequate accessibility and safety for People Living with Disability (PLWD), children and the aged. Current Standards and Specifications include safety treatments and furniture for school crossing areas, pedestrian walkway and signalised pedestrian crossings for very busy roads to afford PLWD and the aged to use the road network safely.

With respect to conflict induced vulnerability, the continuous volatile peace and security situation in the three northern regions, in particular, in recent times further exacerbates the vulnerability of people living in these conflict-prone regions.

5.5.7. Gender Mainstreaming

Travel patterns across the country differ between men and women and so the impact of road sector interventions differs between men and women. For example, data from the 2012 National Household Travel Survey show that nationally just over 55 percent of men walk to work and a further 13 percent of men cycle to work. Conversely, over 74 per cent of women walk to work and only 4.7 per cent of women cycle. The contrast is even starker in urban areas where only just over 36 per cent of men walk to work compared to over 59 percent of women. Equally, even though national figures are still very low, double the proportion of men (at 3.5 percent) travel to work by private car as the proportion of women (at 1.4 percent).

Similarly, the workforce across the transport sector show significantly more men than women employed. The Ministry itself employs 2,816 staff, of which 2,260 are men and 556 are women. Women are also concentrated in certain occupational grades with only 4 senior female directors out of the 556 that the Ministry employs.

There is a policy to ensure the inclusion of females in all its programmes. Accordingly all data including; staff, contractors etc. are segregated to study trends of both gender and their participation programmes. There has been training programmes for gender desk officers to be able to respond to issues as they arise. With regards to the construction industry, the sector has made recommendations to include female workers from the communities to help promote the wellbeing of households.

5.5.8. Cultural Resources

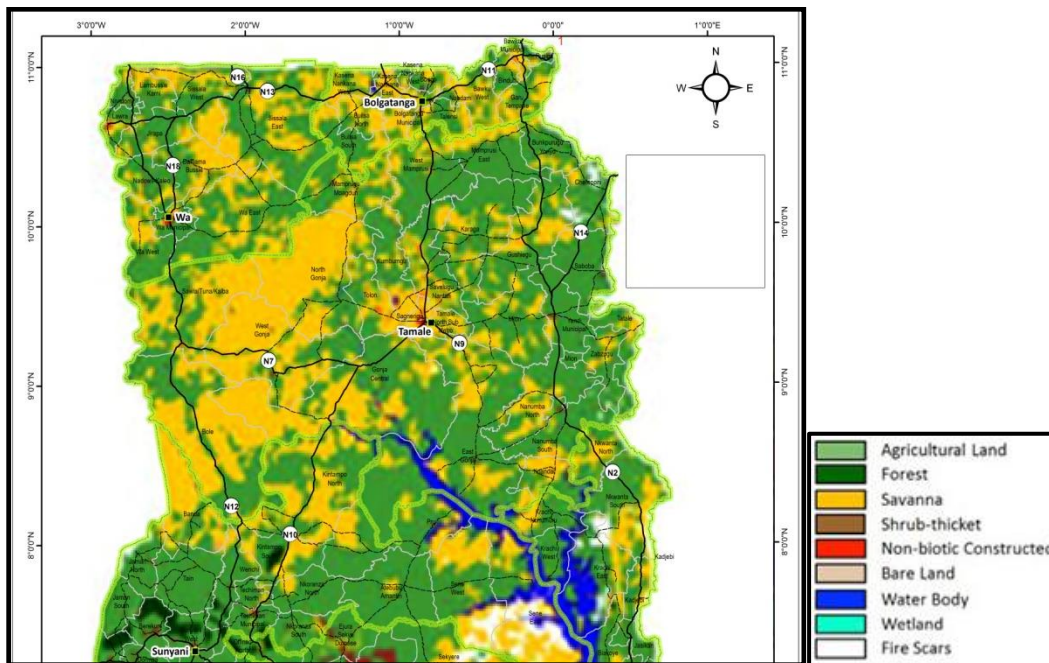
Cultural resources in any country are very important in identifying any particular group of people. In some cultures rivers, mountains, trees, etc. are revered. There are sacred groves and shrines, religious artefacts and places of worship, cemeteries, etc., which people tend to have emotional attachment and sensibility. It is therefore necessary to consider these during road construction in order not to offend any people, but rather preserve our cultural heritage. Furthermore good road networks facilitate the movement of people to festivals which form one of the elements of the culture of the people.

5.6. Land Use

The total country area of Ghana is 238,540 square kilometers (sq km) of which 10 percent is covered by wetlands, including marine and coastal wetlands, inland wetlands, and artificial wetlands such as weirs and lakes. The wetlands include three major river systems which are Volta River, South Western River and Coastal River. About

159,000 sq km is classified as agricultural land, of which 18 per cent is under permanent crops, and 30 per cent is arable land. The area covered by forests is estimated at 20 per cent of Ghana's total land area or 48,240 sq km, down from 74 480 sq km in 1990. Terrestrial and coastal protected areas cover nearly 14 per cent of Ghana's total land area. Figure 5.9 depicts the generalize Land Use Map of the TSIP focus regions.

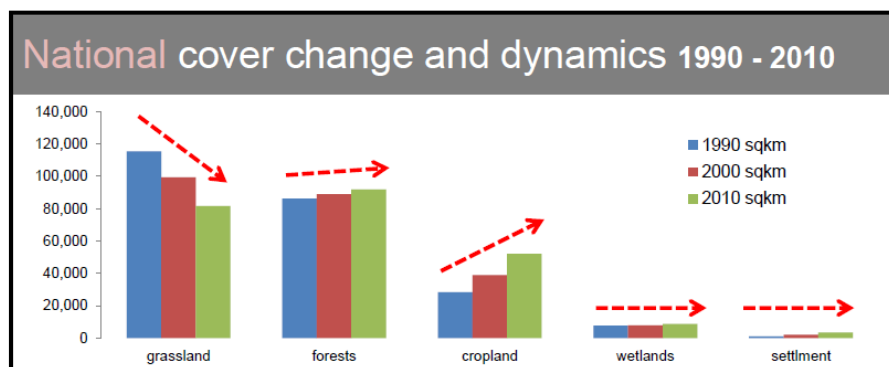
Figure 5.9: Generalised Land Use Map of TSIP Focus Regions



Source: International Population Centre, SDSU, <https://www.google.com.gh/url>; CERSGIS, University of Ghana, Legon

Figure 5.10, below, depicts an analysis of land cover change in Ghana undertaken as part of the preparation of the National Spatial Development Framework 2016 – 2035.

Figure 5.10: National Land Cover Change 1990 - 2010



Source: National Spatial Development Framework, 2016 – 2035

According to the National Spatial Development Framework (NSDF), 2016 – 2035, the major challenges that Ghana will face in the next 20 years include the following:

- Managing rapid land cover change, because from 1990 to 2010, grasslands decreased by 32 per cent while other land cover types increased: forests by 6 per cent, wetlands by 13 per cent, crop land by 66 per cent and settlements by 170 per cent. Forests decreased over the two decades (1990 through 2010) in the four

most-forested regions—Western, Eastern, Central and Ashanti - and losses were also critical in Upper West. Greater Accra; Central and Western regions suffered large wetlands loss;

- Recognising and managing the complexity of national land cover change, because between 1990-2010 some 34 and 18 percent of cropland was lost to grasslands and forests, respectively; some 14 and 7 percent of forests were lost to cropland and grassland, respectively; and settlement gain from cropland exceeded 25 percent in Volta, Upper East and Upper West;
- Controlling urban sprawl and fragmentation, because they are widespread and most evident around large cities, along trunk roads, and at the coast where, for example, Cape Coast and STMA built-up areas are starting to merge; and
- Planning for and reducing urban development density decrease, because it decreased by about 1.2 percent per annum between 2000 and 2010 with the highest rates of decrease in Volta, Brong Ahafo, Ashanti, Upper West and Greater Accra.

The foregoing makes the conscientious integration of land use and transportation planning imperative to harness the synergies of both processes for sustainable development of the Ghanaian economy.

5.7. Air Quality

Sources of air pollution in developing country cities include transportation and industrial pollution, biomass and coal fuel use, and suspended dust from unpaved roads. Poor air quality in the urban environment tends to be particularly associated with high levels of particulates from vehicular emissions. An air quality monitoring project established by the Ghana EPA jointly with the US EPA in Accra showed that the major sources of ambient air pollution are:

- Vehicular exhaust emissions: the largest emitters being older unmaintained vehicles;
- Emissions from Industrial sources;
- Open burning of waste and other materials;
- Road and wind-blown dust; and
- Dry harmattan winds.

Results from research conducted by the EPA in 2015 on Accra's air quality indicates that, generally, the PM₁₀ concentrations recorded at all the locations in Accra are higher (ranged 17 – 1,114 ug/m³) than the EPA-Ghana 24-hour PM₁₀ air quality guideline of 70 ug/m³ and the WHO air quality guideline for 24-hour PM₁₀ of 50ug/m³. Generally, Pb, Mn, SO₂, NO₂, and O₃ concentrations are lower than EPA Ghana/WHO guidelines.

The levels of particulates were much higher in roadside locations. Compared to residential and commercial locations, the level in roadside locations was 2 to 4 times those in the others. In line with this, studies conducted by the Ghana Health Service during the same period indicated that over 51% of persons reporting with a new episode of ARIs during the same period were resident in roadside locations. This is strongly suggestive of the fact that vehicular emissions constitute an important trigger factor for respiratory illnesses. (See map of monitoring sites in Accra in Annex 8 and the detail air quality index recorded in Annex 9).

Air Quality monitoring system exists in Ghana although not in all areas of interest. There is currently no comprehensive policy on Air Quality but the National Environmental Policy (2014) has identified the need to have a comprehensive National

Air Quality Policy. The Air Quality Guidelines (The EPA-Ghana Air Quality Guidelines have been included as Annex 10) in operation are however being converted into standards and the EPA ambient and point source emission guidelines and the Environmental Impact Assessment system/Environmental Management Plan has been developed.⁹

5.8. Noise Pollution

Noise pollution associated with urbanisation is an emerging environmental problem in many developing countries including Ghana. In comparison with other pollutants, the control of environmental noise has been hampered by insufficient knowledge of its effects on humans and of dose–response relationships, as well as by a lack of sufficient data.

Essandoh and Armah (2011)¹⁰ conducted a study to quantify noise and obtain the perceptions of residents in selected neighborhoods in the main commercial area of Cape Coast, Ghana. The focus was on five selected areas: commercial centres, road junctions/busy roads, passengers loading stations, high-density residential areas, and low-density residential areas. The range of noise pollution levels, LNP, at high-density residential areas was 58-68 dB (A), while that of low-density residential areas was 53-72 dB (A). The range of traffic noise index TNI at high-density residential areas was 34-107 dB (A), and that of low density residential areas was 27-65 dB (A). There was a wide disparity in the noise level exposure by the residents in high-density residential areas and that of low-density residential areas.

To address the high noise levels, the Environmental Protection Agency (EPA) in 2012 set out guidelines that come with permissible ambient noise for the aforementioned areas. The permissible ambient noise levels in residential areas are 55 decibels (dB (A)) during the day and 48 dB (A) at night. Those at and around educational and health facilities are 55 dB (A) during the day and 50 dB (A) at night, while the noise level for areas with light commercial or light industrial activities are 60 dB (A) and 55 dB (A) during the day and night respectively. The guidelines also permit 70 dB (A) noise levels during the day and 60 dB (A) during the night for light industrial areas and places of entertainment and public assembly such as churches and mosques are set at 65 dB (A) for day and 60 dB (A) for night. Predominantly commercial areas are allowed 75 dB (A) during the day and 65 dB (A) at night, while the noise level for heavy industrial areas is pegged at 70 dB (A) during the day and night.

TSIP project contractors would be required to comply with the aforementioned EPA Ambient Noise standards.

⁹ <http://www.unep.org/transport/airquality/Ghana.pdf>

¹⁰ Determination of Ambient Noise Levels in the Main Commercial Areas of Cape Coast, Ghana; in Research Journal of Environmental and Earth Sciences 3(6): 637-644, 2011.

6.0 POTENTIAL ENVIRONMENTAL AND SOCIAL IMPACTS

Road infrastructure and indeed the transport sector play a strategic role in the socio-economy development of Ghana. A wide range of environmental and social benefits will arise as a result of road sector projects and programs. These will include economic benefits, employment generation, social services, travel and transport, enhanced gender opportunities, fuel economy and reduced pollution. In spite of the numerous benefits, road sector projects and programs will also have adverse environmental and social impacts which need to be assessed using the ESA prior to implementation of such projects.

6.1. Impact Identification

The Ghana EIA Procedures and the EA Regulations (LI 1652), list construction of highways and roads both as:

- Undertakings requiring registration with the EPA (i.e. Schedule 1 undertakings); and
- Undertakings for which EIA is mandatory (i.e. Schedule 2 undertakings). See Annex 1 for complete list of Schedule 1 and Schedule 2 undertakings.

In a situation where an “undertaking” is listed under both schedules 1 and 2, the higher requirement (i.e. Schedule 2) applies. This therefore means that in Ghana, EIA is mandatory for any road or highway construction project, irrespective of the type or nature or size of the activity, or the location. Accordingly, road projects are mostly subject to EIA. However, routine maintenance and other less impacting road rehabilitation activities are often grouped together and subject to Sectoral EA.

Schedule 5 of LI 1652 lists the twelve Environmentally Sensitive Areas (ESAs) in Ghana (See Annex 1B). The importance of the ESAs list is that it helps establish all areas considered sensitive for purposes of development, and therefore must be avoided as far as possible. However, where development must occur within or near an ESA, such a project will be subject to detail EIA, even for Schedule 1 undertakings. The ESAs include environmental and social criteria, among others. On the basis of the ESAs the sensitivity criteria in Tables 6.1 and 6.2 are used as screening guidelines and will apply in the ESA for screening road projects and for route/corridor selection under the TSIP.

Table 6.1: Road Sector Sensitivity Screening Criteria – Environmental

EPA			World Bank
Types of Road Project (Infrastructure/Service)	Environmental Sensitivity Criteria	Screening Outcome (Level of EA)	Screening Outcome (Level of EA)
Routine maintenance: <ul style="list-style-type: none"> • Patching of potholes • Light grading • Trees and bush clearing • Cleaning of gutters, drains and culverts Periodic maintenance, minor rehabilitation and minor improvement: <ul style="list-style-type: none"> • Spot improvement • Repair and resurfacing short stretches of roads • Upgrading of gravel to bituminous roads Major rehabilitation: <ul style="list-style-type: none"> • Reconstruction of heavy degraded road section • Upgrading • Placing asphalt concrete overlaps • Repair and construction of bridges • Repair and construction of culverts and other structures Road construction Asphalt plant Bituminous plant Work Camp Quarries Crushers Borrow Areas Disposal Areas	<p><i>Non-environmentally sensitive site/route, single or few component activities</i></p> <p>Maintenance/installation/culvert, etc. projects Labour-intensive (limited machinery use) Impacts generally localised, less severe, and scope of impacts narrow, short-term and reversible. Mitigations are easy to design and implement. No need to generate much primary data, especially as baseline.</p>	Sectoral Environmental Assessment	Sectoral Environmental Assessment
	<p><i>Within/bordering or < 0.5 km from an area</i> Declared by law as Wildlife Conservation Areas (including National Parks, Resource Reserves, Wildlife Reserves, Strict Nature Reserves, Ramsar Sites and Wildlife Sanctuaries), or Forest Reserves or Globally Significant Biodiversity Areas</p>	Environmental	Environmental
	<p><i>Within/bordering or < 0.5 km from an area</i> Constituting the natural habitat of any threatened (endangered, data deficient and vulnerable), rare or endemic flora and fauna</p>	Impact	Impact
	<p><i>Within/bordering or < 0.5 km from a</i> Hilly area with gradient > 45 degrees and prone to erosion or rock fall or mudslide or landslide</p>		
	<p><i>Within/bordering or < 0.5 km from an area</i> Susceptible to erosion, flooding, geological hazards (including earthquake, tremor and landslide)</p>		
	<p><i>Within/bordering or < 0.5 km from an area</i> Constituting the head water region of a river or stream or the bank of the drainage channel of a water body</p>	Assessment	Assessment
	<p><i>Within/bordering or < 0.5 km from a</i> Low lying acting as natural buffer against shore erosion, strong winds or for storm floods</p>	Strategic	Strategic
	<p><i>Program or Plan-like Proposals</i> Many phases involved, precise locations may not yet be fully known; Many activities/sub-projects (but type of sub-projects may not yet be fully determined); Diverse impacts affecting other sectors Implementation/construction spread over long periods.</p>	Environmental Assessment	Environmental & Social Assessment

Table 6.2: Road Sector Sensitivity Screening Criteria – Social

EPA			World Bank	
Types of Road Project (Infrastructure/Service)	Social Sensitivity Criteria	Screening Outcome (Level of EA)	Screening Outcome (Level of EA)	
Routine maintenance: <ul style="list-style-type: none"> • Patching of potholes • Light grading • Trees and bush clearing • Cleaning of gutters, drains and culverts Periodic maintenance, minor rehabilitation and minor improvement: <ul style="list-style-type: none"> • Spot improvement • Repair and resurfacing short stretches of roads • Upgrading of gravel to bituminous roads Major rehabilitation: <ul style="list-style-type: none"> • Reconstruction of heavy degraded road section • Upgrading • Placing asphalt concrete overlaps • Repair and construction of bridges • Repair and construction of culverts and other structures Road construction Asphalt plant Bituminous plant Work Camp Quarries Crushers Borrow Areas Disposal Areas	<p><i>Non-socially sensitive site/route, single or few component activities</i></p> <p>Maintenance / installation / culvert, etc. projects Labour-intensive (limited machinery use) Impacts generally localised, less severe, and scope of impacts narrow, short-term and reversible. Mitigations are easy to design and implement. No need to generate much primary data, especially as baseline.</p>	Sectoral Environmental Assessment	Sectoral Environmental Assessment	
	<p><i>Within/bordering or < 0.20 km from</i> A known historical, archaeological or scientific site or infrastructure</p>	<p><i>Within/bordering or < 0.20 km from</i> A cultural resource or site (e.g. cemetery, sacred grove, shrine, church, mosque)</p>	Environmental	Environmental
	<p><i>Within/bordering or < 0.20 km from</i> A medical or health facility (e.g. a hospital or clinic)</p>			
		<p><i>Within/bordering or < 0.10 km from</i> An educational or research facility</p>	Impact	Impact
		<p><i>Within/bordering or < 0.20 km from</i> A human settlement or community or township</p>		
		<p><i>Involving resettlement</i> Or relocation or compensation of more than 20 different persons or families</p>	Assessment	Assessment
		<p><i>Program or Plan-like Proposals</i> Many phases involved, precise locations may not yet be fully known; Many activities/sub-projects (but type of sub-projects may not yet be fully determined); Diverse impacts affecting other sectors Implementation/construction spread over long periods.</p>		
		Strategic Environmental Assessment	Strategic Environmental & Social Assessment	

6.2. Beneficial Impacts of the TSIP

The proposed project is expected to bring important benefits to Government, the road users and the local populations and businesses along the Tamale-Yendi-Tatale section of the east-west corridor and along the roads included in the feeder road networks.

6.2.1. Economic Benefits to Rural Areas

The review of the National Transport Policy and the development of an NMMTMP will provide a sound base to align sector objectives and strategies with Government's development agenda, generating efficiency gains in a sector that is a major contributor to growth and poverty alleviation.

Road improvement provides socio-economic benefits as accessibility and commercial activities are enhanced to facilitate economic integration at all levels. The direct beneficiaries of the proposed road works would be the users of the corridor and the populations of the area where feeder roads are to be improved. These include farmers requiring improved access to both bring farming inputs and extension services to their farms and to transport their produce to their value chain buyers and local communities needing improved access to social services like schools, clinics, hospitals and markets. Smaller towns, villages and rural settlements within the targeted rural areas will benefit directly from smaller socio-economic improvements to the respective villages.

Road development will attract in-migration of people to settle along the road creating more villages and towns and increasing the population of the districts that is benefiting from the road intervention. This in turn results in the increase in the demand for goods which causes more people to engage in various economic activities.

Increased production results in employment generation. It also generates increased farm employment and reduces out-migration in search of jobs in the urban centres. In the construction phase, opportunities for skilled as well as unskilled labour will be available to earn income. Local residents would benefit from direct employment through the civil works funded under the proposed project while the private sector will participate in new opportunities to inspect vehicles and to participate in longer-term asset management contracts as sub-contractors. The impact on employment and income is considered to be significant and positive.

At the local level trading in farm produce will intensify as production levels are increased and diversified and access is gained to wider markets. This will contribute to GDP growth. New industry tends to locate where land is available and infrastructure exists; road corridors are logical choices. Roadside commercial development takes place in response to speculation that improved access and greater visibility will bring more customers. Incomes earned directly or indirectly will bring improvements in the standard of living of the people involved with the project.

6.2.2. Travel and Transport

Road sector projects will help improve the welfare and general well-being of both rural and urban beneficiaries through increased access to health care, education and other social services, rendered closer due to enhanced accessibility. It will provide benefits in respect of road safety or reduced accidents.

The measures to improve road safety at selected schools and to expand the vehicle inspection system to private garages will also directly benefit all road users near these

new facilities. The improved crash data system will identify and justify targeted road safety investments and traffic management interventions to make roads safer and reduce the overall fatalities and injuries.

Road improvements will reduce wear and tear on vehicles. Also, the improvement of the pavement and the vertical as well as the horizontal alignment result in cost-effective fuel consumption per tonnage of payload. The effect on overall vehicle operational costs will be positive and significant. This will significantly reflect in improved travel and lower waiting times, increased frequency of transport services and reduced transport costs.

6.2.3. Gender Issues (Economic Opportunities for Rural Women)

Road sector projects will bring new economic openings for women such as improvement in the agriculture and trading sectors. As more settlements spring up following the new road intervention, women will expand their opportunities for catering and trading, since there will be increased demand for food, goods and services, both in the construction and operation phases. Road availability will indirectly benefit women by easing the drudgery of long distance walking with children to health care centres, etc. The transportation of people and products between the villages will become faster and safer.

6.2.4. Impacts on Physical Environment

Road sector projects will contribute to the ease of movement of vehicles which will result in cost effective fuel consumption and reduced exhaust fumes emission by vehicles plying the road. This in turn will contribute to air quality improvement in settlements along road corridors.

6.3. Potential Adverse Impacts of TSIP

The TSIP and sub-projects could exert adverse effects on the social and physical environment within which they are implemented. Table 6.3 provides a list of environmental and social issues common to road sector activities in Ghana. The issues listed provide useful guide in the scoping stage and terms of reference preparation for Sectoral EA and EIA of road sector projects.

Table 6.3: Environmental and Social Issues Common to Road Sector Activities¹¹

	Issues that are Common (in a decreasing order)
1	Dust
2	Tree& vegetation removal
3	Top soil removal
4	Pits/trenches near road
5	Noise
6	Inadequate drains along roads
7	Road construction waste generation & disposal
8	Induced development
9	Stream diversion / blocking
10	Run off
11	Compensation issues/agreement
12	Flooding

¹¹ Source is MRH. Based on feedback from road sector stakeholders in Ghana following stakeholder consultations in 2007??

13	Cultural concerns
14	Water contamination
15	Habitat disruption
16	Road accidents
17	Public Safety
18	Extensive construction (impact) corridor
19	Forestry concerns (e.g. access)
20	Wildlife concerns
21	Resettlement
22	Archaeological losses

6.4. Assessment of TSIP Impacts

The main adverse environmental and social impacts of road projects identified in Section 6.3 are assessed in this section.

6.4.1. HIV/AIDS

The HIV/AIDS pandemic is a severe one that should continue to engage the attention of authorities in the road transport sector and in the management of workers in the sector. The facts below support the need for the inclusion of clear principles on HIV/AIDS in road sector projects and programs.

Findings of international studies of HIV/AIDS in work places suggest that the road sector is a breeding ground and a vehicle for the HIV/AIDS epidemic. The reason is simple: people working in the road sector have to be mobile, they have to spend much time away from their homes and satisfy their sexual needs on the road. Migration - short term or long term, increases opportunities to have sexual relationship with multiple partners, thus becoming a critical factor in the propagation of HIV/AIDS.

Considering the youthful nature of the age group most affected and the fact that the road construction and transport sector is largely made up of a youthful population, any impact of the epidemic on the sector will adversely affect the overall national development. A comparison of the 2003 GDHS and 2014 GDHS HIV prevalence estimates indicates that HIV prevalence for all adults age 15-49 remains essentially unchanged—the small decrease from 2.2 percent in 2003 to 2.0 percent in 2014 is not statistically significant. While this suggests that the situation is stabilising, there is a need for concerted action to maintain those interventions that have led to this reduction. The interventions must also be scaled up to ensure that their impacts are felt as far as possible.

The mode of transmission of HIV/AIDS is largely through a pleasurable and natural activity. Some conditions in road transport sector may naturally facilitate the transmission of the virus and consequently fuel the epidemic. These are to do with the predominantly migrant nature of the workers which create absences of workers from family for prolonged periods. This is a situation that has the potential to fuel the practice of extramarital affairs and unsafe sexual practices.

An explosive HIV/AIDS infection would be catastrophic to the fortunes of the country. Some of the grave consequences for the society as a whole will include losses in productivity, increase in health care costs, and human resources management costs such as recruitment, retraining, absence and relief. Although awareness of the disease is said to be very high amongst the Ghanaian population, behavioural change lags far behind this awareness. This is likely to be the case among road sector workers as well.

In the rehabilitation of the Tamale-Yendi-Tatale road corridor, the recruitment of local labour and the influx of migrant labour and the possible vicinity of some labour camps to small towns may likely create situations where HIV/AIDS may spread rapidly if adequate precautions are not taken.

6.4.2. Health and Safety Impacts

Injuries

Accidents constitute one of the most important risks in road construction and maintenance resulting in injuries. These are likely to arise from moving machinery in the course of operation, unguarded parts of equipment and a disregard for health and safety measures. These are likely to pose risks to the workers. Injuries may also arise from road traffic accidents which may occur when parts of roads are being plied while road construction is still underway. This has the potential of harming both workers and road users, including pedestrians. Other sources of injuries are noise, vibration and heat, and also lubricants some of which contain solvents with potential to cause skin irritation and allergies, respiratory disorders and acute poisoning.

Public Health Impacts

These include damage to health from air pollution – mostly dust, communicable diseases such as tuberculosis, and also malaria whose transmission may be enhanced by improper drainage, borrow pits, drainage ditches (collecting water) created from excavation and quarrying during construction activities. These activities – especially quarrying, may also result in injuries especially from blasting and transportation of large rocks.

Health Damage from Air Pollution

Air pollution adversely affects health of people engaged directly or indirectly in road sector activities. The effects are due largely to particulates from vehicular emissions and constructional equipment powered by gasoline or diesel as well as silica in dust from the earth agitated by constructional equipment and vehicles plying on uncompleted and untarred roads. The resultant effects are acute respiratory disorders, lung and heart diseases, the type of ailment depending on the size of particulates as well as the materials adsorbed on them. Larger particulates cause acute irritation of the upper airways resulting in coughs and colds, while particulates with diameters of the order of 2.5 μ to 10 μ are inhaled into the lower airways, (bronchi and bronchioles) and may enter the lungs. Acute manifestations of its effects include inflammatory conditions like bronchitis, bronchiolitis and pneumonia which may be rapidly fatal. Other pollutants like SO₂, NO₂ and CO emanating from vehicular emissions also contribute to respiratory ill health. Asthmatics are particularly sensitive to irritant substances like SO₂ which may bring on attacks. Long term exposure is associated with chronic lung diseases such as lung cancer and silicosis. Apart from respiratory effects, dust may result in irritation of mucous membranes or allergic reactions that may be particularly harmful to the eyes and skin.

6.4.3. Water Resources Impacts

Road development activities can modify the hydrology of an area, affecting aquifer recharge, groundwater discharge, and the water table and flow characteristics. There can also be deterioration in water quality of both surface and groundwater. Potential sources of impacts are site preparation and clearing activities, heaping of materials, blocking

and narrowing water channels and flows at certain points. In some cases the speed of flow may be increased resulting in flooding, ponding, soil erosion, channel modification and siltation of streams. Earthworks, road drainage and excavation, erection of embankments and structures can reduce or raise the water table (through restricting flow). Other sources of water pollution include sedimentation, changes in biological activity in streams and on their banks, chemicals spillage, contaminated run off from petroleum product drippage, exhaust emissions, pavement and tyre wear, and corrosion of metals, among others.

The rehabilitation and minor realignment of the already existing paved Tamale-Yendi-Tatale road is not expected to generate large water resources impacts. In reality, drainage would be improved, culverts repaired and in some cases replaced with larger size culverts leading to better water flows, elimination of stagnant water and minimization of flooding.

6.4.4. Landscape Alteration Impacts

Landscape modifications occur, sometimes very severe in areas surrounding road developments, particularly where the road construction leads to conflict with adjoining landscape features (e.g. natural relief and morphology, hydrology, recreational areas, cultural heritage sites). Quarrying, borrow pits and gravel mining associated with road construction potentially scar and degrade the landscape. However, in case of the Tamale-Yendi-Tatale road the modification to the landscape, if any, is expected to be minor.

Based on current information / observation, there are a number of operating quarries within the vicinity of the Tamale-Yendi-Tatale road (including Pwalugu) and borrow areas (including a sand pit at Ghani near Zabzugu) which can be sourced for crushed stones / gravel (gravels is along the entire corridor) and construction material for the rehabilitation of the road. As such, the project does not envisage development of new quarries and access roads, thus minimizing additional impacts. However, the final decision for the source of construction materials will be made by the OPRC Contractor who may decide to develop his/her own quarry and ancillary facilities such as access roads, crusher plants, etc. In that case, the permitting of the quarry and the environmental /social impacts of the quarry plus access roads plus crusher plants, etc. will be subject of the Contractor's ESIA.

With respect to the Feeder / Farm roads, these are engineered gravel / dirt roads currently being maintained by DFR and that the availability of construction material is not considered a problem. The final length and locations of the Feeder roads to be rehabilitated are not known. Once the selection is finalized, the information will be used to prepare an environmental assessment of the selected roads and develop roads specific EMPs using the principles developed in the ESA. Please see Annex 12 for sample terms of reference for preparation of project-specific ESIA and ESMP.

6.4.5. Impacts on Soil

The important soil properties to support productive activities and biodiversity are lost through compaction with heavy machinery, topsoil removal and sheet erosion in high rainfall areas, road waste dumping, spillages, and excavations and burrow pits, among others. Erosion might result in adverse cumulative effects far beyond the road corridor and the project area of influence, affecting slopes, streams, rivers, and dams. Agriculture may be affected and also fishing through sediment transfer in run-off into

water bodies. Road development although narrow and linear in character removes considerable amount of land from production. Spillage of hazardous products in transit is also a potential source of soil pollution. The fact that the Tamale-Yendi-Tatale road is an existing road, its rehabilitation will have minor impact on soil.

6.4.6. Land Acquisition and Property Loss

Compulsory land acquisition (expropriation of property for public projects) and demolishing of structures such as buildings, shops associated with road developments can result in displacement of communities, loss of business, properties and incomes, social stress, social and psychological disruption for the affected individuals and families. For the Tamale-Yendi-Tatale road, very little land acquisition is envisaged as this is an existing road, realignment is expected to be minor, and most of the work will be done within the ROW.

6.4.7. Communities and Economic Activities Impacts

Road development can have significant long term adverse impacts on human communities. These impacts include splitting up of communities, loss of roadside community business and social activities, disruption of links between villages and their farmlands, increased land and property values leading to higher rents, and displacement of lower-income tenants. The introduction of faster traffic, access controls, and median barriers generally cuts traditional lines of travel or communication in communities.

6.4.8. Noise and Vibration Impacts

Heavy duty machinery and vehicular movement, friction between vehicles and the road surface, driver behaviour, vehicles' horns, construction and maintenance activities, quarrying, blasting, crusher plants, asphalt plant operations, resonance of traffic may increase ambient noise levels and vibration beyond the immediate road corridor. The long term effects of excessive noise and vibration include human welfare and physiological disruption, hearing impairment and communication problems. These may cause elevated stress levels and associated behavioural and health problems. They can also cause auditory fatigue, sleep disorders, and even contribute to learning problems in children. Vibrations can damage roadside structures, particularly makeshift or lightly constructed buildings. Noise also has the potential to disrupt wildlife habitats and movement in sensitive areas.

Again, the rehabilitation and spot improvements such as culvert replacement will create localised noise but the impacts are expected to be short lived and minor.

6.4.9. Impacts on Cultural Resources

Road developments lead to damage to areas of historic, scientific, social and amenity values, and also affect the aesthetics of cultural monuments and archaeological resources. This can occur where road design and construction do not take account of such cultural heritage and resources. Damage may also be caused by road construction related works such as quarries and burrow sites, and unregulated access to cultural heritage sites (including, Sacred Groves, Shrines, Churches, and Mosques).

Since the realignment, if any, is expected to be minor and since most of the rehabilitation is expected to be within the already disturbed right-of-way, disturbance of physical cultural resources is not expected.

6.4.10. Habitat Destruction and Disruption (flora and fauna impacts)

Important wildlife habitats, threatened and endangered species of flora and fauna may be destroyed in road projects. Road corridors, particularly in new construction may cut through ecosystems and compromise their stability and health. Plant and animal communities may be fragmented into weaker ecological sub-units, rendering them vulnerable to invasions and degradation. The opening up of burrow pits and quarries to support road construction is equally destructive to wildlife and habitats.

Erosion from poorly constructed and rehabilitated sites (of both road and related areas) can lead to downstream siltation, contaminating water resources and ruining fish spawning grounds. Alterations of flow regimes, flood cycles, tidal flows and water levels can upset trophic dynamics by affecting the life cycle of plankton, with corresponding effects on the entire food chain. Re-channeling of waterways is often undertaken as part of road construction to avoid flooding and make crossing structures simpler. In the process, natural streambeds are interfered with adverse consequences.

The flora and fauna along the Tamale-Yendi-Tatale road was disturbed long ago during the construction of the original road. Most of the animals have either relocated or adapted to the traffic and human activities. The flora has already been replaced by tertiary growths. The rehabilitation and maintenance work plans to use existing borrow area and quarries and the impacts are expected to be minor. The project will also improve drainage to minimize erosion and downstream siltation.

6.4.11. Waste Generation and Disposal Impacts

Different forms of solid and liquid waste including excavation spoil, construction waste, waste asphalt, sewage, garbage and oil spills from construction equipment are generated. Areas alongside road construction and also newly constructed road turn to become centres of intense trading which leave in its trail serious sanitation problems. Construction related wastes and wastes from asphalt plants, labour camps, and maintenance depots will require careful management, such as proper handling, collection, storage, transportation and safe disposal, to ensure minimal impacts on the environment.

6.4.12. Traffic Disruptions and Diversion Impacts

There can be serious disruptions to local traffic and also accidents during road construction and rehabilitation. The situation can be aggravated without carefully planned detours and road closures. The effect of traffic disruptions includes increase in noise, dust, travel time, congestion, social stress and agitations. Some traffic disruption and diversion may occur during the rehabilitation of the Tamale-Yendi-Tatale road, but this will be well planned and carried out in consultation with the Police and the local communities.

6.4.13. Utility Disruption Impacts

Construction activities usually require re-alignment of utility supply lines such as water, telephone and electricity. This can disrupt the supply of essential services to communities for rather long periods, especially where road project execution takes unusually long duration. In the case of Tamale-Yendi-Tatale road, since the road already exists and most of the utilities were relocated at the time of the original construction, utilities relocation, if any, is expected to be minor.

6.4.14. Labor Influx

Construction activities would lead to the attraction of people seeking job opportunities. This potential labour influx, even if modest, may lead to negative impacts on the host communities and pre-existing social issues in the host communities can easily be exacerbated. Common risks associated with labor influx include: i) risk of social conflicts; ii) increased risk of illicit behaviour and crime; iii) impacts on community dynamics; iv) increased burden on/and competition for public service provision; v) gender-based violence; and vi) increased pressure on accommodation and rent.

The peace and security situation in the Tamale-Yendi-Bimbilla environs has been very volatile in the recent past. This could be exacerbated by the unregulated influx of labor and/or the lack of project opportunities for qualified locals. The projects would incorporate concrete mitigation measures to, as far as practicable, utilize local labour (where available) and institute proactive measures to educate local communities about the need to bring in skilled labour when necessary.

7.0 ENVIRONMENTAL AND SOCIAL IMPACT MITIGATION PRINCIPLES

The section provides general mitigation principles of the ESA covering thirteen broad areas for use in the project EAs under the TSIP. The section also outlines a comprehensive risk assessment of the TSIP and measures for controlling the identified risk. Lessons learnt from other road sector projects in Africa (specifically Uganda) and how these are intended to be addressed under the TSIP is also provided.

7.1. HIV/AIDS Mitigation Principles

The national strategic plan for HIV enjoins each sector to develop sector specific plans and strategies, hence the provision in the MRH's organisational structure in Annex 3, to cater for the road sector specific workplace policy. There is commitment at all levels of management to ensure that necessary budgetary allocations are made towards HIV/AIDS issues, and that the policy is implemented as intended. Highlights of the principles which will be followed are set out below, based on ILO guidelines and those of the Ghana AIDS Commission. It will be applicable to all employees of the sector. The provisions will also be binding on contractors.

- HIV/AIDS prevention clauses will be incorporated into works contracts and the bills of quantity.
- The ethical principles governing handling of persons with other medical conditions will apply. Relationships of infected /potential workers will be governed by the basic human rights as enshrined in the Constitution of Ghana. Dismissals will not be based on HIV status.
- Provisions regarding HIV/AIDS will be integrated as far as practicable with existing labour relations policies and regulations.
- An HIV/AIDS prevention and treatment policy for work places will be enforced.
- Due care and confidentiality will be exercised in handling information regarding the HIV status of workers in the sector.
- Workplace programs on HIV for road contractors will be established and will include preventive activities through:
 - Advocacy via information provision, education and communication;
 - Peer education and counselling;
 - Condom use promotion and distribution;
 - Counselling and care for people living with AIDS (PLWAs) –
 - Facilitation of voluntary counselling and testing of HIV status of workers,
 - Provisions for management of sexually transmitted infections (STI),
 - Assistance to bereaved families,
 - HIV /AIDS education to communities in which workers of the sector are working will be included in target groups for education and information provision.

7.2. Health and Safety Mitigation Principles

The following constitute the basic principles that will be observed to prevent and control health hazards as well as safety risks in the transport/road construction sector.

7.2.1. Air Pollution Mitigation Principles

The WHO estimates that air pollution causes approximately 2 million pre-mature deaths a year more than half of these occurring in developing countries. It further indicates that

reducing levels of particulates (PM₁₀) will reduce deaths in polluted cities by as much as 15% every year. Projects will factor the potential health benefits in controlling air pollution generated in road development and the transport sector.

The transport sector agencies will collaborate with EPA to develop air quality management plans which will, among others aim at the following principles:

- Facilitating the use of cleaner fuels and the use of compressed natural gas;
- Promoting the culture of vehicular maintenance in the country; and
- Ensuring effective use of water to control dust emission.

To minimize dust pollution from construction and emissions from the contractor's vehicle, the Contractor will be encouraged to carry out proper maintenance of his vehicles, to ensure that he uses clean fuel, to practice just-in-time delivery of materials to minimize dust pollution, cover haul and dump trucks carrying soil, sand, aggregates, etc. with tarpaulin and to practice water spraying regularly especially near sensitive locations.

7.2.2. Occupational Safety and Health Principles

A comprehensive occupational safety and health (OSH) policy based on the tenets of the Labour Act 651, 2003 will be implemented for the transport sector. Its provisions will be extended to contractors engaged to work in the sector. It will also protect the general public. Commitment to the implementation will be facilitated through resources allocation for its take-off.

Road sector projects will incorporate a system of hazard identification and risk assessment of hazards identified. Employee health care services will be taken care of through preventive care in the form of appropriate immunizations, and pre-employment and periodic health screening as well as exit examinations. Medical care for ill-health and injuries will also be catered for.

The successful contractor will be required to provide Personal Protective Equipment (PPE) to all its workers and with training on how to use the equipment. The contractor will be expected to enforce regular use of the PPE by its staff.

7.2.3. Community Health Principles

Community outreach programs will be factored in all new projects planned for in any location. This will help protect the communities from injury or ill-health caused directly or indirectly by the road transport activities. The principles outlined below will be applied to the Tamale-Yendi-Tatale road and the affected feeder roads to minimize / mitigate impact of pollution.

7.3. Particulate Emission Mitigation Principles

The principles to follow to reduce air quality impacts, especially particulate matter by the contractor will include:

- Water dousing to minimize dust;
- Contract specifications to include dust control measures;
- Re-routing traffic away from populated areas and reducing traffic congestion;
- Covering of hauling trucks carrying sand to avoid dust emission;

- Locating material storage areas away from communities and environmentally sensitive receptors;
- Minimize work / disturb areas
- Practice in-time delivery of materials
- Reclaim / restore disturbed areas as soon as work is completed.
- Selecting road alignments which avoids houses, schools, and workplaces; and
- Planting tall, leafy and dense vegetation between roads and human settlements to filter pollutants.

7.4. Soil Pollution Mitigation Principles

A number of mitigation and management principles will be used to protect the soil including:

- Minimizing the area of ground clearance along the construction corridor;
- Avoiding sensitive alignments, including steep slopes;
- Progressive replanting of disturbed areas during construction;
- Specifying as contractors' obligation to cover issues such as erosion control, spillage prevention during construction, and planting and ensuring effective re-vegetation;
- Engineering solutions such as intercepting ditches at the tops and bottoms of slopes, with gutters and spillways used to control the flow of water down a slope;
- Enforcement of emission and discharge standards by the EPA;
- Guidelines for transport of hazardous substances defining permissible routes; and
- Emergency response procedures for spillages.

7.5. Water Resource Protection Principles

Mitigation principles to prevent, minimize and manage impacts on water resources from road projects will include:

- Avoid alignments which are susceptible to erosion, such as those crossing steep slopes;
- Minimize the number of water crossings through alternative route surveys;
- Use clean fill materials around watercourses such as quarried rock containing no fine soil;
- Provide reservations/buffer zones of undisturbed vegetation between road sites and water bodies;
- Provide settling basins to remove silt, pollutants, and debris from road runoff water before discharge to adjoining streams or rivers;
- Construct run-off channels, contouring or other means of erosion control;
- Pave sections of roads susceptible to erosion and sedimentation; and
- Compensate by providing alternative source of water such as bore holes for communities adversely affected.

7.6. Habitat Protection Principles

Mitigation principles to address habitat destruction and disruption impact in road projects by contractor will include the following:

- Avoiding environmentally sensitive areas to prevent severe impacts on flora and fauna;
- Crossing of water bodies will be minimized, and buffer zones of undisturbed vegetation will be left between roads and watercourses;
- Replanting in road rights-of-way and adjacent areas to accelerate re-vegetation and succession;
- Re-engineering road cross-section designs by using narrower widths, lower vertical alignments, smaller cuts and fills, flatter side slopes, and less clearing of existing vegetation;
- Providing wildlife and animal crossings to facilitate movements;
- Fencing or planting barriers to reduce the risk of collisions between animals and vehicles;
- Providing “aquatic crossings” with culverts designed with the needs of migratory aquatic species in mind;
- Installing traffic control measures, e.g. speed limits, particularly at night in areas of frequent animal crossing, erection of warning signs, etc.; and
- Installing roadside reflectors to scare animals away from the roadway when vehicles approach at night.

7.7. Landscape Improvement Principles

The following mitigation principles will be followed to address the effects of landscape alterations:

- Reforestation or re-vegetation of all scarred areas during road projects;
- Landscaping of areas adjoining right of way;
- Selection of alignment characteristics that best fit the chosen corridor into the landscape; and
- Prompt reclamation of degraded lands.

7.8. Land Acquisition and Economic Impact Principles

The following mitigation principles will be followed to prevent or reduce impacts of / from land acquisition and loss of property:

- Choosing route locations away from built-up areas and restricting the extent of road works to avoid interference with existing activities;
- Adoption of a reduced speed design, reduced right-of-way land requirements, or design changes (underground drainage, for instance) to reduce impacts on properties and activities;
- Alternative considerations in route selection;
- Integration of mitigation measures in road designs, where appropriate;
- Compensation rates for owners of the land, properties, etc. that reflect current market realities; and
- Resettlement / rehabilitation of affected persons where possible (preparation of resettlement action plan).

7.9. Noise and Vibration Mitigation Principles

Noise and vibration will be minimized through the following mitigation principles:

- Application of a bituminous surface layer over worn concrete roadways against frictional noise;

- Use of open-graded asphalt smooth, well-maintained surfaces such as freshly laid asphalt without grooves and cracks will keep noise to a minimum;
- Road design will avoid steep grades and sharp corners to reduce noise resulting from acceleration, braking, gear changes, and the use of engine brakes by heavy trucks at critical locations;
- Provision of noise barriers, including “tree belt” or “tree buffer”;
- Environmental specifications for contractors in the road construction, quarrying and other such activities in noise and vibration-sensitive areas (with special attention paid to equipment noise standards, hours of operation, material haulage routes, and other aspects of work-site management; and
- Enforcement of noise control guidelines (EPA permissible noise levels).

7.10. Cultural Resources Preservation Principles

- Road construction will avoid alignments that cut through known cultural sites;
- Cultural resources uncovered during road works will be handed over to the National Museums and Monuments Board for preservation or preservation of the site;
- When cultural resources are found (chance find) during road works, the work should be stopped and the Museum and Monuments Board invited to excavate and remove the artefacts;
- Salvage excavation and relocation of artefacts or ruins from a cultural site;
- Collaboration between the Road Agencies and the Museums and Monuments Board in determining and avoiding damage to cultural sites and resources; and
- Marking and fencing important cultural sites during the construction period.
- The World Bank chance find procedure shall be incorporated in the Contract documents to deal with chance find of artefacts in for example, borrow areas, road side excavation, etc.

7.11. Waste Generation and Disposal Principles

Waste management mitigation principles will include:

- Disposal of construction and related waste materials at designated and approved waste dump site;
- Adoption of waste minimization measures;
- Incorporation of waste management plan in road planning and contract specifications;
- Collaboration with relevant District Assemblies to enforce appropriate sanitation and other bye laws; and
- Public awareness campaigns to observe proper waste management measures.
- Speedy reclamation of waste disposal and borrow area sites.

7.12. Traffic Disruption Mitigation Principles

- Provision of carefully planned diversion routes during construction; and
- Use of signboards and other public information mechanisms to inform the public in advance of construction work, schedule closure or diversion, etc.
- Educate construction equipment and haul truck drivers to obey posted signs and minimize traffic disturbance.

7.13. Utility Disruptions Mitigation Principles

The following mitigation principles will be followed by the Road Sector Agencies to minimize impacts of utility disruptions:

- Issuance of advance public notices about disruptions;
- Collaboration with utility providers to plan and quickly re-align utility services;
- Provision of alternative supplies where applicable, e.g. water supply by tankers to affected communities; and
- Restoration of utility lines and other structures either rerouted or damaged during the construction.

7.14. Labor Influx Mitigating Principles

The following principles will be followed in assessing and avoiding, minimizing and/or mitigating labor influx:

- Tapping into the local workforce by adopting a recruitment criteria that is transparent and fair to local communities;
- Advertising upcoming opportunities through the local media;
- In consultation with local authorities, prepare a roster of interested workers and their skills to identify suitable labor pool locally;
- Provide list of local labor pool to contractors at pre-bid meetings for recruitment consideration;
- Train local workers within a reasonable timeframe to meet project requirements (if such trained staff are needed afterwards for the operation and maintenance of the infrastructure);
- Limit work permits for workers with skills unavailable locally;
- Prohibit contractors from hiring onsite and instead set up formal recruitment offices to discourage project “followers” from loitering and/or settling around the project site in hope of job opportunities.
- Institute a working project-level GRM that is known to and accessible by the host community to manage labor influx related risks.

7.15. Grievance Redress Management Principles

GRM will be based on the following guiding principles:

- **Simplicity:** procedures in filing complaints are understandable to users and easy to recall.
- **Accessibility:** filing complaints is easy through means that are commonly used by stakeholders, especially by the project-affected people.
- **Transparency:** information about the system is made widely available to all stakeholders and the general public.
- **Timeliness:** grievances are attended to and resolved in a timely manner.
- **Fairness:** feedback or complaints are validated thoroughly and subjects of complaints are given due process and opportunities for appeal.
- **Confidentiality:** the identity of complainants remains confidential.
- Provide multiple uptake points to build trust and confidence in the GRM. Complainants will be provided with multiple channels to submit their complaints.
- Develop a simple system (possibly electronic based) for receiving, sorting, verifying, and tracking complaints for more effective management of grievances. Use cell phones where feasible to lodge and track complaints.

- Publicly disclose the complaints/grievance redress arrangements so that people are aware of where and how complaints will be managed.

7.16. Risk Assessment and Control Measures

Table 7.1, below, presents a comprehensive assessment of potential environmental and social risks associated with the various stages of TSIP and the measures to be adopted to control these risks.

Additional resources to provide guidance on the avoidance, minimization and mitigation of potential adverse impacts are included in the Annexure. These include: i) Environmental Codes of Practice (ECOPs) in Annex 16; ii) Environmental Clauses for inclusion in the contract (Annex 17); and iii) Summary of potential environmental and social impacts associated with Road Projects and Mitigation Measures (Annex 18).

Table 7.1: Environmental and Social Risk Assessment and Control Measures

Project Phase	Environmental and/or Social Risk	Measures to control risk	Risk Rating
PREPARATION	Inadequate road Design	Design should be thoroughly reviewed with ESIA/ESMP	Very High
	ESMP of project ESIA not carried through detailed design, preparation of BOQ and contract document	Borrower and Bank to ensure the full integration of the ESIA/ESMP through design to contract preparation	Very High
	Inadequate consideration of environmental and social risks in contract document	Contract document should be reviewed against ESIA/ESMP recommendations	High
	Contractor’s responsibilities not clearly spelt out in the implementation of the ESMP	Adequate safeguard clauses should form part of the Contract	High
	Non-inclusion and/or inadequate provision for “Code of Conduct”, HIV/AIDs sensitization and awareness, Gender Based Violence, Child Abuse and Exploitation in Contract Documents	Contract should include adequate provision to address “Code of Conduct”, HIV/AIDs sensitization and awareness, Gender Based Violence, Child Abuse and Exploitation.	Very High
IMPLEMENTATION	Changes in design leading to new impacts not anticipated in project ESIA / ESMP	Any changes in design should be matched with corresponding environmental and social mitigation measures	High
	Lack of Contractor’s appreciation of Environmental and Social issues	Provision should be made in the process of selecting the Contracting Entity to ensure the appreciation of, and prior experience with safeguard issues is paramount	Very High
	Timely preparation of Contractor’s ESMP	Timelines for the submission of the ESMP should be spelt out in the Contract	Moderate
	Contractor’s ESMP too generic to enforce	Approved ESMP should be project specific	Moderate
	Inadequate Capacity of Contractors workers to implement ESMP	Contract should include clauses that are punitive for inadequate implementation of safeguard issues	High

Project Phase	Environmental and/or Social Risk	Measures to control risk	Risk Rating
	Mitigation measures and remedies of the ESIA/ESMP difficult to implement	Mitigation measures should be practically implementable with alternative measures	Moderate
	Inadequate public consultations during the project preparation	Adequate and effective consultations should run through the entire phases of the project with functional GRM available and known to the locals; projects should be required to prepare and implement public consultations and disclosure plans.	Very High
	Risks and impact of labour influx on project and local communities not understood or underestimated	Adequate and effective consultations should run through the entire phases of the project with functional GRM available and known to the locals	Very High
	Functional grievance redress mechanism (GRM) not in place	Adequate and effective consultations should run through the entire phases of the project with functional GRM available and known to the locals; projects should be required to prepare and implement public consultations and disclosure plans.	Very High
	Availability of right-of-way (ROW) for project implementation (Full implementation of RAP)	RAP should be prepared, cleared, disclosed and implemented prior to the commencement of the works	Extremely High
SUPERVISION	Safeguard Specialist with inadequate man-month as part of supervision/monitoring team	Adequate provision should be made available to the Safeguard Specialist of the Supervision team	Moderate
	Deployment of unskilled and inexperienced Monitoring Consultant	Capacity of Monitoring Consultant should be thoroughly assessed during procurement process	Very High
	Delayed approval of Contractor's ESMP, HSP, TMP etc	Timelines for the approval of the ESMP should be spelt out in the Contract	Moderate
	Delayed detection, flagging and recommendation of additional safeguard problems to Contractor	Effective supervision and monitoring as well as reporting is very critical	Moderate
	Non-Inclusion of Safeguard issues in supervision reports including GRM	Reporting on safeguard issues as part of the consultant's reports should be clearly spelt out in the Contract	Moderate

Project Phase	Environmental and/or Social Risk	Measures to control risk	Risk Rating
MONITORING BY BORROWER	Inadequate institutional capacity of AITs to monitor the Contracting entity and Monitoring consultant	Capacity of AITs should be enhance for effective monitoring	High
	Limited resources for monitoring	Resources made available to the Borrowers monitoring team should be adequate to ensure effective monitoring	High
	Inadequate Monitoring and Enforcement of ESMP implementation	The Borrower and Monitoring Consultant monitoring reports should be clearly spelt out in the project implementation manual	Moderate
	Generic ESMP making it difficult to monitor	Contractor's ESMP should be project specific and easy to monitor	High
MONITORING BY THE BANK	Deployment of unskilled and inexperienced safeguard staff for supervision	Capacity of Bank's monitoring team should be enhance for effective monitoring	High
	Delayed detection and flagging of safeguard problems to Borrower	Action Plans of Monitoring reports should be enforced	High

8.0 ESA IMPLEMENTATION AND MANAGEMENT

The ESA has been prepared for supporting the integration of environmental and social aspects within the decision making and implementation process of the TSIP. It will also support compliance with applicable laws and regulations of GoG apart from meeting the requirements of the relevant Bank policies.

This chapter lays out the overall approach or methodology to be followed for managing environmental and social issues/impacts in the project cycle of TSIP. It also provides guidance on the management measures to be adopted for various types of planned investments under the project in general.

The chapter addresses the key ESA areas relevant to its successful implementation, including:

- Safeguards management approach and process;
- Institutional arrangements;
- Capacity building;
- Environmental and social monitoring and reporting; and
- Environmental and social principles and clauses.

8.1. Environmental and Social Measures of the Tamale-Yendi-Tatale Section

As mentioned earlier, the Tamale-Yendi-Tatale road link consists of about 118 km of paved road to Yendi and about 63 km of unpaved roads. The 118 km Tamale-Yendi paved section is considered in a fairly good state of repair requiring minor horizontal correction in alignment, strengthening of some road sections, repair/replacement of selected culverts, rehabilitation of some drains, and spot improvements to mitigate safety concerns. The 63 km of the unpaved section from Yendi to Tatale may require similar treatment and resurfacing using gravel, unless the road assessment study, currently underway, recommends paving.

Most of the environmental and social impacts associated with the rehabilitation of the Tamale-Yendi-Tatale road would result from various material needs for construction and maintenance of the road. The impacts may arise from acquisition, transportation, storage, handling and disposal of such materials either from quarries, borrow pits, asphalt plants, crushers, etc. Much of the impacts result from dust generation, noise, traffic, safety, wastes from construction camps, oil, erosion, drainage, etc.

Some of the Sinsanblegbini Forest Reserve along the Tamale-Tatale road is already planted with teak and eucalyptus trees and managed by private commercial interests. The rest of the woodlands is highly degraded and is used by the local villagers to carry out farming, fire and building wood harvesting and illegal hunting. The project will engage Ghana Forestry Department to assist them with updating the forest management plan.

Based on current information / observation, there are a number of operating quarries in the vicinity of the Tamale-Yendi-Tatale road (including Pwalugu) and borrow areas (including a sand pit at Ghani near Zabzugu) which can be sourced for crushed stones / gravel. Gravels is available along the entire corridor. As such, the project does not envisage development of new quarries and access roads, thus minimizing additional impacts.

In general, the following mitigation measures (see Table 8-1) will be applied to Tamale-Yendi-Tatale road rehabilitation project to minimize construction / maintenance impacts to the environment.

Table 8-1: Environmental and Social Measures – Tamale-Yendi-Tatale Section

Environmental Issues / Impacts	Mitigation Measures
Soil erosion / sediment control / surface runoff	<ul style="list-style-type: none"> • Keep vegetation clearing to a minimum • Limit ground disturbance to area of workable size especially during wet season • Isolate construction area from clean runoff • Revegetate all areas immediately after construction activities finish • Use silt traps in all drainage ditches
Management of material stockpiles	<ul style="list-style-type: none"> • Ensure that stockpiles do not block surface runoff drains or natural drainage • Install drainage to isolate stockpiles • Restrict stockpile height to 3m to minimize wind erosion • Erect windbreakers and / or cover stockpiles especially if prolonged exposure to rain or wind is envisaged • Install silt traps in ditches to prevent / minimize sediments in runoff
Extraction of materials	<ul style="list-style-type: none"> • Obtain borrow and quarry materials from designated and approved / licensed suppliers • Restore and revegetate borrow areas to promote natural drainage • Ensure trucks transporting materials are not over loaded and covered
Storage / handling of fuels and lubricants	<ul style="list-style-type: none"> • Store fuel oil and bituminous products in dedicated, contained locations away from water. • Store fuel in excess of 1,000 liters in sealed tanks on a concrete base that is bunded to hold 110% of the tank capacity. • Collect and dispose of all waste oil, oil and fuel filters at an approved landfill.
Air quality / Dust	<ul style="list-style-type: none"> • Minimize exposed soil / material stockpile surfaces to wind • Install wind breaks around material stockpiles, concrete batching and asphalt plants • Spray water on exposed soil surfaces and access roads • Equip asphalt plants with either baghouse or wet scrubber for removing particulates
Noise	<ul style="list-style-type: none"> • Use modern and well maintained equipment with mufflers • Schedule noisy construction activities during normal working hours • Use noise barriers / screens or dirt mounds to shield sensitive locations • Advise local residents and authorities of any unusual or unavoidable noise activities
Health and Safety	<ul style="list-style-type: none"> • Ensure all occupational health and safety requirements are in place on construction sites and in work camps • Install lights and cautionary signs in hazardous areas • Establish footpaths and pull-off bays along roads through villages, near markets, schools and other community facilities

	<ul style="list-style-type: none"> • Limit construction activities from 0700 hr to 1900 hr to limit exposure to dust, noise etc. • Enhance safety and inspection procedures • Ensure use of Personal Protection Equipment (PPE)
Disruption of utilities	<ul style="list-style-type: none"> • Maintain high standards of site supervision and operation to reduce risks of damage to water, power and telecommunication lines • Prepare procedures for rapid notification to the responsible Authority • Provide assistance with re-instatement, in the event of any disruption
Site rehabilitation	<ul style="list-style-type: none"> • Excavate any contaminated soil from fuel depots / workshops, remove and reshape the area. • Rake or loosen all compacted ground surfaces • Ensure that waste and surplus materials are removed from site and disposed of properly • Contour sites to conform to the surrounding landscape and natural drainage. • Apply topsoil and re vegetate the site using local flora

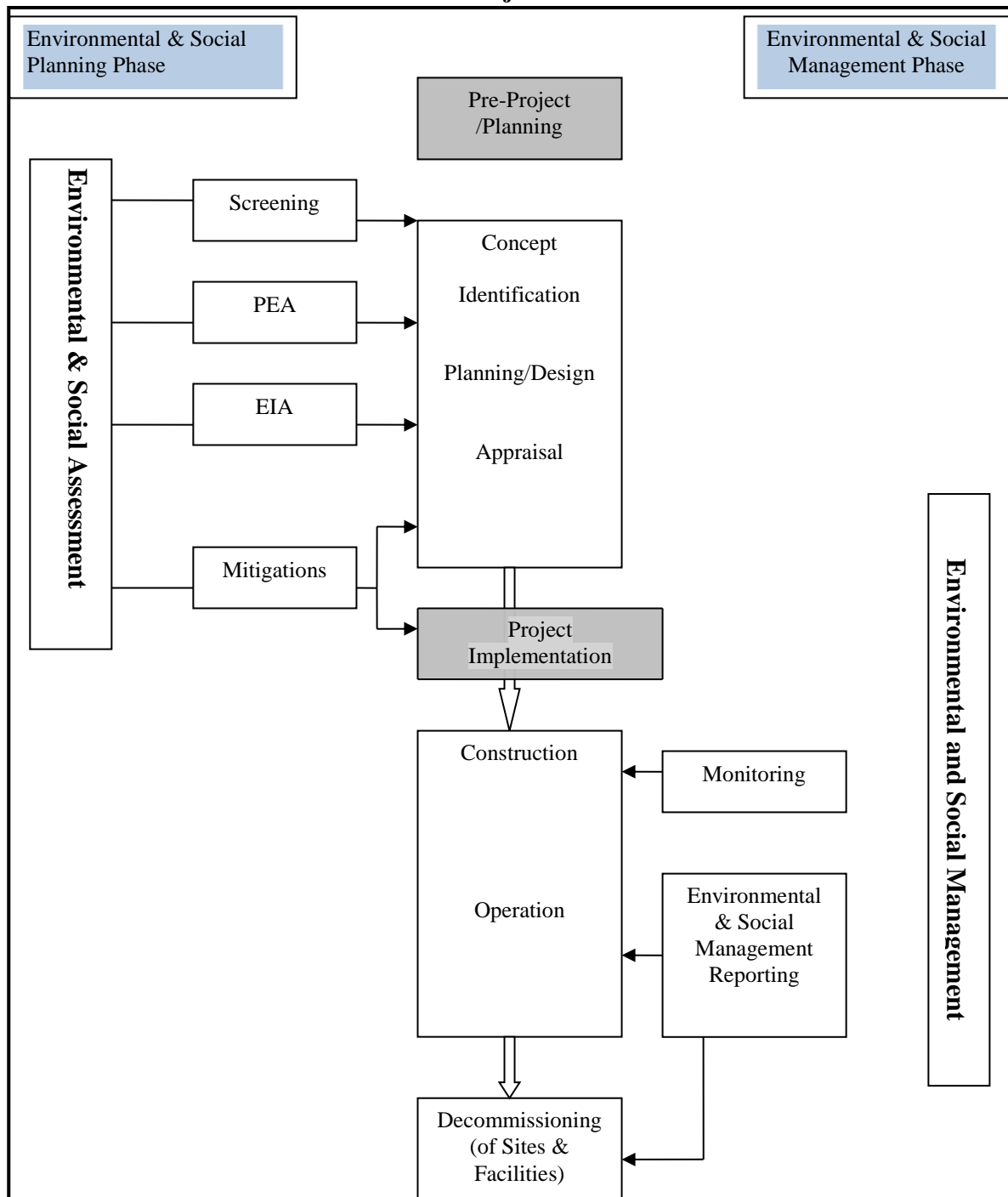
8.2. Environmental and Social Management Approach and Process for the Other Subprojects

The environment management process and the instrument for TSIP have been designed keeping in mind the varied scope of work/activities under the project. To effectively plan, design and integrate environmental and social dimensions into project preparation and implementation cycle, key steps have been formulated. These steps must be followed through the key stages of the project cycle such as concept identification, screening (including its documentation), assessment (basic or detailed as needed), implementation review and monitoring.

8.2.1. Safeguards Implementation Approach

Figure 8.1 illustrates the general interactions of the environmental and social planning and management processes for road sector projects in Ghana (irrespective of contracting model). The environmental and social planning aspect encompasses the environmental and social assessment (ESA) and the pre-project/planning processes.

Figure 8.1: Environmental and Social Planning and Management Scheme for Road Sector Projects



Source: Derived from the Environmental Assessment in Ghana: A Guide Context of EIA within Environmental Planning & Management

The ESA process links up with the pre-project/planning process. This signifies the interdependence of the two processes (i.e. EA and feasibility) which are purposefully designed to influence one another, in order to evolve a road project that is a product of these two processes. In the context of the ESA, environmental and social planning is a process that identifies and assesses (through “consultation”) the potential concerns and implications that may arise with the implementation of a road project, in order to

influence the design and other engineering feasibility options and decisions, for informed and sustainable project development.

The project environmental and social management (ESM) as shown in Figure 8.1 is also linked to the project implementation activities. The ESM comprises monitoring, management (of environmental and social impacts and mitigations), auditing and reporting (Annual Environmental Report, EMP, etc.), while project implementation activities include construction, landscaping, decommissioning of sites, facilities, equipment and machinery, and also road use. The ESM is a process of follow up during the implementation phase of a road project to verify:

- The adequacy of the environmental and social considerations and assumptions;
- Effectiveness of mitigation measures being implemented;
- Compliance with mitigation and other environmental and social requirements;
- Unanticipated or residual impacts that have arisen requiring remedial action;
- How far the road construction contractor is meeting or adhering to required environmental and social principles, standards and commitments; and
- Extent to which project monitoring and reporting requirements are being met.

The place of mitigation measures in Figure 8.1 exemplifies the logical connection between the planning and the implementation phases of a road project. The mitigation measures once identified are incorporated into the road project design. In this way, the outcomes of the ESA become integral part of the road project design and costing, but not as an after-thought, or an add-on after the project design and planning is complete. The linkages between the ESA and the pre-project/planning, and between the ESM and project implementation activities are depicted in Figure 8.1.

The World Bank operational procedures and Ghana's EA requirements are harmonised as far as possible, which makes the ESA responsive to the objectives of good practice, in the following respects:

- Early consideration of environmental and social issues (starting at the screening stage);
- Identification and early consultation with stakeholders;
- Prevention of adverse impacts through the consideration of feasible alternatives; and
- Incorporation of mitigation measures into planning and (engineering) design.

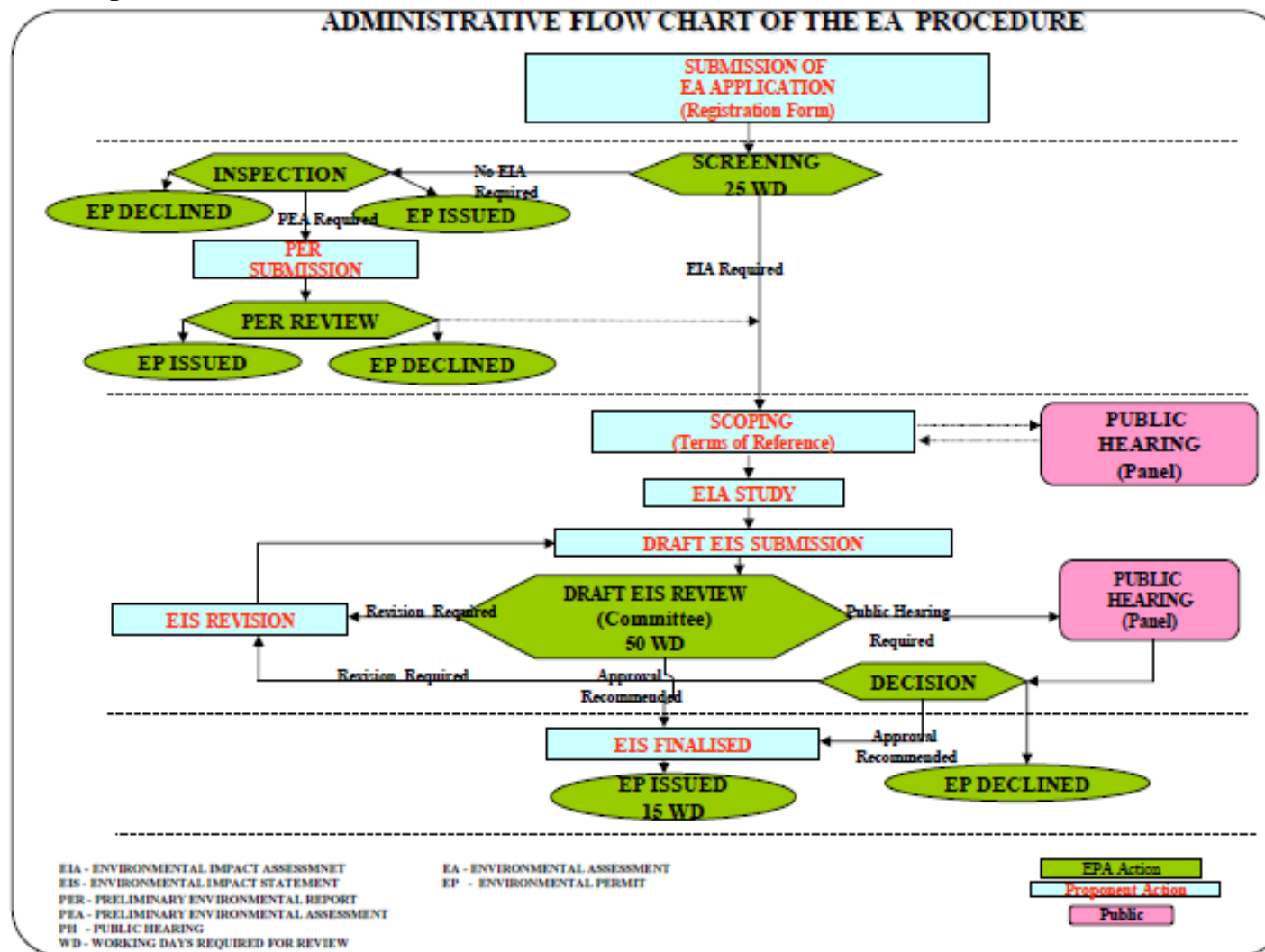
Tables 6.1 and 6.2 (pages 52 and 53) outline the Ghana Road Sector Sensitivity Screening Criteria that guide route/corridor selection and screening of projects within the MRH, GHA, DUR and DFR. The main levels of EA following screening (i.e. screening outcomes) under the Ghana Regulations are that:

- No further EA required (corresponds to Bank's Category C);
-
- Strategic Environmental Assessment (SEA) required (corresponds to Bank's Sectoral or Regional EA).

Figure 8.2 (overleaf) depicts the Administrative Flow Chart of the Ghana EA Procedure. The diagram indicates the timeframe for EPA review and decisions and highlights the roles and responsibilities of the EPA, project proponents and the public in the process. The figure schematically outlines the two main trajectories of the Ghana EA Procedure, "No EIA" and "EIA required" options after the EPA has conducted its own screening of the project proposal.

One or a combination of the environmental and social screening criteria or factors in Tables 6.1 and 6.2 would lead to the assigned screening outcome or decision on the appropriate level of EA for a particular road project. The screening guideline is detail and specific on environmental and social sensitivity criteria, in order to readily help avoid sensitive sections of a selected route or alignment. This inherently engenders the consideration of alternative routes or construction corridors or segments, as far as possible, as an incentive to settle for the lower PEA or Sectoral EA requirement rather than EIA.

Figure 8.2: Administrative Flow Chart of the Ghana EPA Environmental Assessment Procedure



8.2.2. Safeguards Management Process

Within the framework of EPA's EA Procedure (Figure 8.2), the ESA outlines specific elaborate process steps and responsibilities for safeguards management of the project.

8.2.2.1. Process Steps and Responsibilities for TSIP sub-Projects

The process steps and responsibilities for safeguards management and compliance under the TSIP will vary significantly from that of the traditional contracting.

In OPRC/PPP type of project, ESIA is prepared in two stages: (i) the preliminary ESIA is prepared by the Assessment Consultant hired by the Road Authority to assess the road links for inclusion in the project. For the selected links, the Assessment Consultant prepares conceptual design which is used to prepare the preliminary ESIA - using the ESA and RPF as guidance documents. The Assessment Consultant also prepare the bid documents and assists the client (the road authority) to select a Contractor (Contracting Entity) to construct the project; and (ii) the Contracting Entity prepares detailed design (approved by the client) and revises the preliminary ESIA based on the detailed design. A sample of terms of reference for the preparation of project-specific ESIA and ESMP is included in Annex 11. The Contracting Entity also prepares the CEMP (construction EMP), RAP and Monitoring Plan that will be approved by the Borrower and the Bank before commencement of any related work. . The RAP has to be implemented before the construction begins.

To assist with the monitoring of the implementation of these contracts, the implementing agencies (MRH, MoT, GHA, and DFR) will employ Monitoring Consultant(s) for the duration of the OPRC/PPP contracts.

Figures 8.3 and 8.4 outline the process steps for environmental and social planning and management of TSIP sub-projects. The two schematics match the respective process steps with the entity responsible for taking the particular action. The roles and relationship between the Safeguards Units of Road Sector agencies, the OPRC contractor and other private consultants in the process are highlighted. The important role of the EPA and the WB in the schemes and their respective relationships with the other key actors in the process are shown.

Figure 8.3: Environmental and Social Planning and Management of TSIP sub-Projects (Planning & Preliminary Permitting Stage)

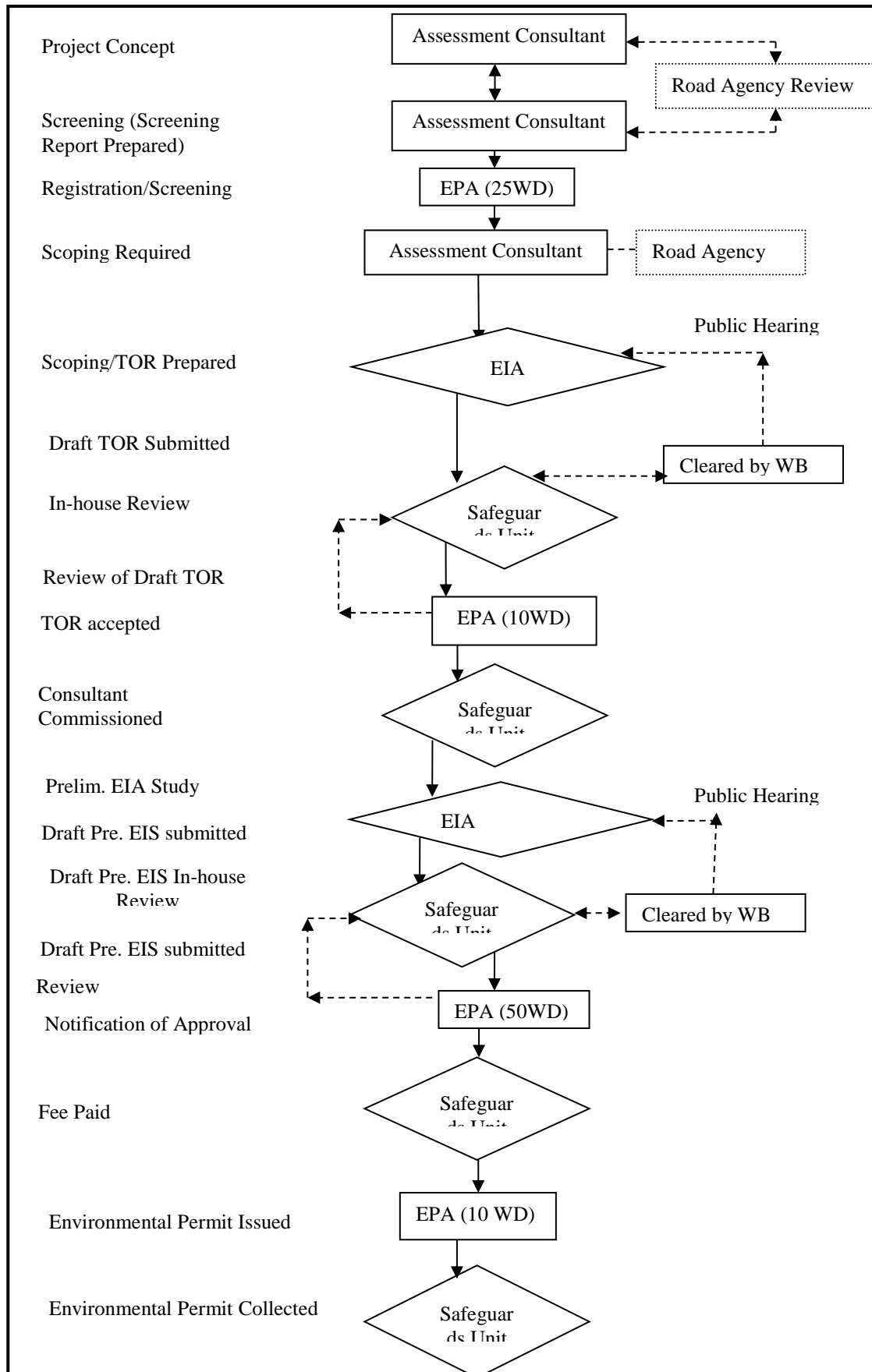
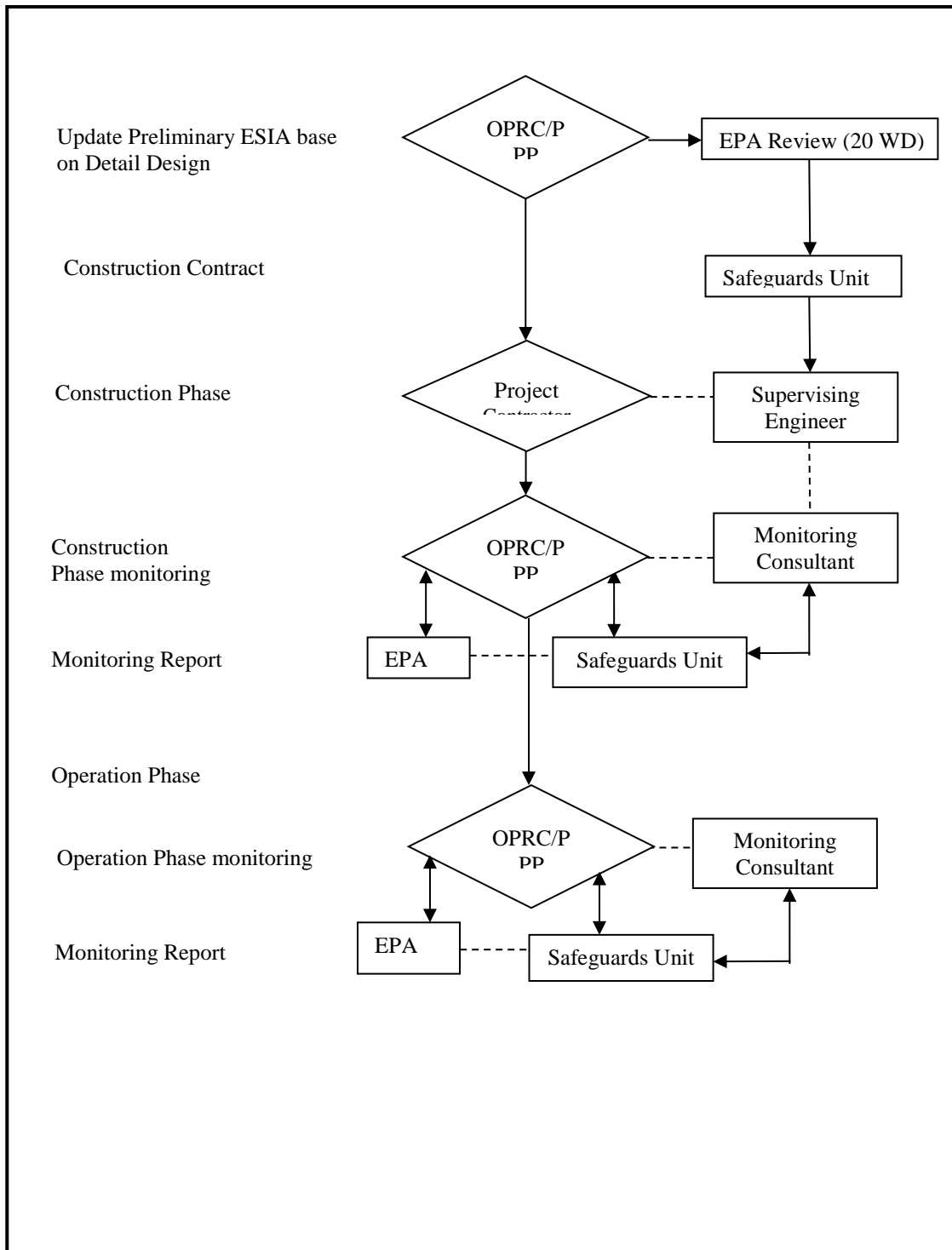


Figure 8.4: Environmental and Social Planning and Management of TSIP sub-Projects (Construction & Operation Stage)



8.3. Community Engagement, Consultation Strategy and Participation Framework

8.3.1. Community Engagement Strategy

The key elements of the citizen engagement strategy for TSIP will include the following: (i) Disclosure of important project related information by the implementing agencies and contracting entities on its website and at the appropriate local level and other disclosure procedures agreed with the Bank, (ii) framework for consultation with the key stakeholders including the affected communities and important road user groups (e.g., GPRTU) during planning, design and implementation of all sub-projects; (iii) ensuring free, prior, informed consultation with the affected communities and key road user groups and their representatives for obtaining broad community support as a part of preparation of specific sub-projects relevant to that area; (iv) the establishment of Grievance Redress Mechanisms (GRM) at PIT, IA (AIT) and project site levels to meet specific grievance redress requirements of operations/projects; (v) promoting community based risk reduction initiatives with the participation of and networking with relevant stakeholders including women, school children, youth, civil society organizations, and local bodies.

Key objectives of community engagement strategy are: help manage community expectations. In this context, it is important to specifically target vulnerable groups, including women and children. Also, engaging local NGOs active in the area may help to provide outreach programs.

8.3.2. Consultations Strategy and Participation Framework

To ensure peoples' participation in the planning phase and aiming at promotion of public understanding of project scope, activities and impacts, various sections of project affected persons and other stakeholders will be engaged in various consultation throughout the project planning and implementation.

Public participation, consultation and information dissemination in all road sector operations/projects will begin with initial Social assessment activities during the initial phases of project preparation. Public consultation activities and information dissemination to PAPs and local authorities will continue as the project preparation activities proceeds in a project.

Through respective road sector departments, local governments and civil society, PAPs will be regularly provided with information on the project and the resettlement process prior to and during the project preparation and implementation stages. The information dissemination and consultation with PAPs during project preparation will include but not limited to the following:

- Project Description and its Likely Impacts
- Objective and Contents of the Surveys
- General Provisions of Compensation Policy
- Mechanisms and Procedures for Public Participation and Consultation
- Resettlement Options (Reorganization on Remaining Land, Relocation to a Fully Developed Resettlement Site, or Cash Compensation)
- Grievance Redress Procedures and its Effectiveness
- Tentative Implementation Schedule
- Roles and Responsibilities of Sub-Project Proponents And Local Authorities
- Feedback Regarding Relocation Site (S)

- Explanation of Compensation Procedures and Mode of Compensation for various kinds of lost Assets.

This framework shall be a sub-set of the overall communication strategy of all TSIP sub-projects. Some potential methods for the purpose of communication will include provisions of information boards, pamphlets distribution, wall paintings, gong-gong beating, organizing meetings with key informants and village committees and opinion gathering through post cards, phones and SMSs. All road sector projects will be required to prepare and disclose Public Consultation and Communication Plans as part of the project preparation process. A percentage of the project cost will be allocated for preparation and implementation of communication strategy.

It is good practice to document details of all public meetings held with people and local government officials with dates, location and the information provided and the major emerging issues. It is recommended that RAP and other documents include this list, as an attachment. Where public announcements are made, the details, together with a copy of the text of the announcements should be provided in the documents. A template for consultation framework is presented in Table 8.2 below.

Table 8.2: Consultation Framework

Project Stage	Consultation Activity
Project Preparation	<p>Information dissemination and consultation with PAPs during field surveys:</p> <ul style="list-style-type: none"> • Project description and its likely impacts • Objective and contents of the surveys • General provisions of compensation policy • Mechanics and procedures for public participation and consultation • Resettlement options (reorganization on remaining land, relocation to a fully developed resettlement site, or cash compensation) • Grievance redress procedures <p>It is a good practice to prepare a brief Public Information Brochure (PIB) for distribution to all the PAPs. The PIB will very briefly explain the sub-project objectives, likely benefits and adverse impacts, general provisions of the compensation policy, and grievance redress mechanisms.</p>
	<p>Information dissemination to local authorities after completion of census & inventory and during the ESIA/ESMP/RAP preparation:</p> <ul style="list-style-type: none"> • Sub-project components • proposed policies and procedures including proposed resettlement strategies • a summary of impacts • request for identification of resettlement sites, if necessary • tentative implementation schedule • roles and responsibilities of the sub-project proponents and local authorities
	<p>Consultation with community and other key stakeholders:</p> <ul style="list-style-type: none"> • Feedback regarding relocation site(s), if applicable. • Options for the mode of compensation for affected assets • When the draft ESMP and RAP are available they should be provided to key stakeholders and local NGOs in their native language and put in a public place. Feedback should be

	<p>requested and incorporated into the final documents. The feedback could be received through email, phone, face-to-face interaction, meetings etc.</p> <p>Details of all the public meetings held with people and local government officials with dates, location and the information provided and the major emerging issues should be documented. It is recommended that ESMP and RAP and other documents include this list, as an attachment. Where public announcements are made, the details, together with a copy of the text of the announcements should be provided in the documents.</p> <p>The draft ESMP and RAP/SIA should be discussed with local authorities and a copy of the document should be kept with regional and district level authorities. PAPs should be informed through public announcements on the availability of the draft documents at the district and local government level.</p>
Project Implementation	<p>Information dissemination and consultation with PAPs during ESMP and RAP implementation:</p> <ul style="list-style-type: none"> • Sharing ESMP and RAP document with local authorities • Major policy resettlement policy provisions and grievance redress mechanism should be informed to the PAPs and beneficiary households in the project area through village level public meetings. • One to one meeting with the PAPs to explain their eligibility • Placing of micro plan for compensation and resettlement in affected villages for review and minimize grievances • Payment of compensation to PAPs in public meeting to maintain transparency • Household consultation for skill improvement training, use of compensation amount and livelihood restoration
Public Participation in Project Monitoring and Ex-Post Evaluation	<ul style="list-style-type: none"> • Establish Stakeholder Monitoring Group (SMG), consisting of affected people and civil society members. The group will be responsible for monitoring of all aspects of EMP and resettlement implementation and provide feedback to the implementing agency. • Participation of PAPs in monitoring will provide project management with a more accurate reflection of PAPs reactions and perceptions.

8.4. Institutional Arrangements

The GHA, DUR and DFR are the main road sector executing agencies under the MRH. The other institutions whose functions relate to road projects in terms of interference with utility provision and service lines, and natural resource management in corridor selection, and project environmental approvals and management include:

- 1) **Environmental Protection Agency (EPA):** The role of EPA is fundamental as the lead environmental regulator, which oversees compliance with EA requirements in Ghana, facilitates public participation and disclosure, and issues environmental permits for road projects. The EPA has the mandate to decide on project screening, guide the conduct of any EA studies and to grant environmental approval for road sector projects to commence. Its mandate also covers monitoring of implementation phase of road projects to ensure compliance with approval conditions, mitigation measures, and other environmental commitments and quality standards. The agency therefore has an important role in the ESA implementation.

Consistent with good practice, the project team briefed the EPA about the ESA and to elicit EPA's contribution and review role. EPA made significant input into the ESA preparation through sharing of relevant documents and its responses to inquiries. Further informal consultations were held on relevant issues on the draft reports. The ESA will be duly registered with the EPA to enable the agency appropriately apply the requirements and commitments in the ESA to TSIP activities.

- 2) **Water Resources Commission (WRC):** The Water Resources Commission Act, Act 552 of 1996, created the Water Resources Commission (WRC) that was made responsible for integrated water resources management including permits for water abstraction. In accordance with the Water Use Regulations L.I. 1692, the sources of water for which permits are related are freshwaters such as stream, rivers, and lakes, and springs, and underground water. Water uses/for purposes such as construction, damming, dewatering, diversion, dredging, and freshwater spillage, among others require permitting. Any alterations to, abstraction from and disturbance of freshwater resources occasioned by TSIP subprojects will require approval and permitting from WRC. The WRC role in safeguards management is usually coordinated with the EPA as part of the EA process.
- 3) **Forestry Commission (FC):** The Forestry Commission of Ghana is responsible for the regulation of utilization of forest and wildlife resources, the conservation and management of those resources and the coordination of policies related to them. The Wildlife Division (WD) and the Forest Services Division (FSD) of the Forestry Commission (FC) are the wildlife and forest resource management institutions respectively. These institutions become relevant whenever such resources under their management are likely to be impacted on or implicated in a proposed road project. WD and FSD will be consulted in the planning and decision processing to prevent, avoid, reduce or mitigate the likely impact of the project. They may also have to give their consent with respect to the extent to which such resources may be affected or lost as a result of the TSIP. WD and FSD role in safeguards management is also usually coordinated with the EPA as part of the EA process.
- 4) **Utility Service Providing Institutions:** ECG, GWCL, CWSA, Vodafone and BOST are public/private institutions that provide and/or manage utility services including, electricity, water, telecommunications and petroleum transmission and storage infrastructure. These are all linear transmission facilities either through underground pipes or overhead lines along some TSIP road network corridors. The proposed TSIP road operations and interventions may affect such transmission lines. These may require relocation, realignment, etc. to make room for the road operation, which calls for the involvement of the respective utility companies or institutions in the decision-making processes and implementation of required safeguards actions as appropriate.

Furthermore, the institutions may have monitoring responsibility or supervisory oversight during construction in an area of concern or interest to them.

8.5. Assessment of Borrower Capacity to Implement Safeguards

Table 8.3 (overleaf) show the current safeguards staff strength of the four (4) main road sector agencies. The EA/EM activities undertaken by the current staff is presented in Annex 12.

The major capacity issues has to do with the staffing numbers, skill sets and the availability of and exposure to the use of basic environmental monitoring equipment (especially for noise and dust monitoring) and appropriate modern technologies (including GPS) within the main implementing road sector agencies (MRH, GHA, DUR, and DFR). The environmental and social safeguards units/desks of the road sector agencies are grossly inadequate (see Table 8.3 below), lack the full complement of the variety of skill sets (e.g., Social and Environmental Safeguards Specialists) needed to perform their functions, and are highly under-resourced with respect to the equipment and modern technologies needed to perform their required functions and roles effectively and efficiently. More so, with the introduction of Output and Performance-based Road Contracting, which require very effective and robust monitoring systems, the lack of adequate capacity and resources within the road sector poses a major risk to the success and effectiveness of road sector projects, more particularly OPRC ventures.

Though under the TSIP full time Monitoring Consultants will be engaged who will monitor the performance of the Contracting Entity to deliver the promised product, in terms of safety, riding surface, maintenance, environment, etc. so as to make monthly payments, this would also mean additional work for the agency safeguards staff with respect to oversight of Monitoring Consultants and review of monitoring reports.

Apart from regular check-ups, the Department and Ministry line staff will not conduct day-to-day monitoring. However, some additional training would be required and some hand held equipment such as noise monitors, particulate matter (PM10) monitors and SO_x, NO_x and CO₂ monitors. In addition, a computer-based monitoring system to facilitate rapid tracking of project activities and for quick generation of various kinds of reports will be required. The result of an assessment of needs of the respective safeguards units of the road sector agencies is presented in Annex 13.

Table 8.3: Agency Safeguards Staffing Capacity

Agency	No. of Staff	Rank	Edu. Qual.	Years of Safeguards Experience	Previous Safeguards Training	Self Rank Capacity to Perform Safeguards Function (Low = 1, High =5)	Comments
MRH	2	Principal Engineer	MSc.	11	Yes	4	Not on full-time schedule
		Asst. Devt. Plng Officer		1	Yes		Not on full-time schedule
GHA	4	Chief Engineer	MSc.	20	Yes	5	
		Chief Env'tal Officer			Yes		Due to retire this year
		Sen. Env'tal Officer	MSc.	8	Yes	4	
		Engineer	BSc.	1	Yes	3	
DFR	2	Principal Engineer	MSc.	13	Yes	4	Not on full-time schedule
		Engineer	MSc.	6	Yes	4	Not on full-time schedule
DUR	2	Principal Planner	MSc.	10	Yes	3	
		Asst. Env'tal Officer	BSc.	1	Yes	2	

To mitigate the safeguards capacity constraints, the following specific institutional strengthening measures are proposed: i) the appointment of a full-time social specialist with gender experience; ii) the use of a Non-Governmental Agency (NGO) to assist communities and oversee the grievance redress system; iii) focused training programs for safeguards staff; and iv) dedicated funding for safeguards operational costs. These measures will enable regular site visits, required for consistent implementation oversight.

Table 8.4, below, presents various training requirements for a spectrum of stakeholders within the road transport sector.

Table 8.4: Training Requirements for Various Stakeholder Groups in the Road Sector

	<i>High Level Project Management and coordination</i>	<i>Regional Environment Authorities</i>	<i>PIT, AIT, Technical Team Members</i>	<i>Community Leaders/beneficiaries</i>
<i>Linkages between environmental, social and natural resource management and sustainable rural livelihoods</i>	<i>A</i>	<i>T</i>	<i>T</i>	<i>S</i>
<i>National/Regional ESIA legislation and relevant World Bank Safeguard environmental policies</i>	<i>A</i>	<i>T</i>	<i>T</i>	<i>S</i>
<i>Potential localized impacts of subprojects and suitable mitigation measures</i>	<i>A</i>	<i>T</i>	<i>T</i>	<i>S</i>
<i>Addressing land acquisition and access to resources through resettlement planning and compensation</i>	<i>A</i>	<i>T</i>	<i>T</i>	<i>S</i>
<i>Use of the ESMF/ESA, its procedures, resources and forms</i>	<i>A</i>	<i>T</i>	<i>T</i>	<i>A</i>
<i>Integrating climate change in environmental assessment</i>	<i>A</i>	<i>T</i>	<i>T</i>	<i>A</i>
<i>Integrating labor, HIV and gender related issues into environmental assessment</i>	<i>A</i>	<i>T</i>	<i>T</i>	<i>S</i>
<i>Environmental reporting requirements</i>	<i>A</i>	<i>T</i>	<i>T</i>	<i>A</i>
<i>Methods of community involvement</i>	<i>A</i>	<i>T</i>	<i>T</i>	<i>A</i>
<i>Cumulative impacts assessment</i>	<i>A</i>	<i>T</i>	<i>T</i>	<i>A</i>
<i>OPRC and PPP contracting models and their implications for environmental and social safeguards application and management</i>	<i>A</i>	<i>S</i>	<i>T</i>	<i>A</i>
<i>Legend: T = Detailed training, S = Sensitisation to the issues, A = Awareness-raising</i>				

8.6. Environmental and Social Monitoring and Reporting

Monitoring is a key component of the ESA during project implementation. Monitoring assumes an even more importance given the adoption of output and performance-based contracting arrangements which depend on outcomes as against input tracking monitoring. This will increase considerably private sector involvement in TSIP

operations; requiring more stringent monitoring regimes to assure value for money for TSIP investments.

The significance of monitoring stems from the fact that the inputs derived from the ESA into the project design and planning, including mitigation measures are based largely on “predictions”. It is essential that the basis for the choices, options and decisions made in formulating or designing the project and other environmental and social safeguard measures are verified for adequacy and appropriateness. Monitoring verifies the effectiveness of impact management, including the extent to which mitigation measures are successfully implemented. Monitoring specifically helps to:

- Improve environmental and social management practices;
- Check the efficiency and quality of the EA processes;
- Establish the scientific reliability and credibility of the EA for the project (as well as the quality of experts providing EA consultancy services in the TSIP); and
- Provide the opportunity to report the results on safeguards and impacts and proposed mitigation measures implementation.

Monitoring is one of the principal activities of the environmental and social management (ESM) phase of a road project (Figure 8.1). Once environmental permit is secured for a project, contract is awarded and the project implementation will commence. The Environmental Units of MRH, GHA, DUR and the DFR (and the Monitoring Consultants, as appropriate) commence monitoring as an important feedback mechanism. This ensures that the environmental and social mitigation measures:

- Identified in the planning phase (contained in the EA report), and incorporated in the project design and costed are being implemented;
- Are maintained throughout the construction phase and where applicable in the road-use phase and to the decommissioning of sites, facilities and equipment; and
- Where inadequate, additional remedial actions are identified (including corrective measures or re-design of mitigation measures).

The monitoring by the Environmental Units is effectively on the contractor engaged in the TSIP subproject, and covers other areas such as adherence to the environmental and social clauses and principles. The EMPs and RAPs that are prepared and/or the other mitigation provisions that are made as components or part of the project ESA will also be monitored, the Environmental Units playing a lead role. The monitoring results will be analysed and the monitored information and recommended actions will be compiled for the attention and action by the respective road sector agencies. The monitoring report will be formalized with the agency’s agreed action and timeframes, and submitted as the respective road agency’s AER to the EPA and the MRH, and the Bank.

The EPA carries out its own compliance monitoring to satisfy itself that the permit conditions and relevant standards and mitigation measures are being fulfilled by the executing agency. The AER from the executing agencies often forms the basis for EPA’s compliance monitoring. Traditionally, EPA’s oversight role covers or represents the monitoring interest of the other institutions. These institutions such as WRC, WD, FSD, etc., however, have the right to perform their own monitoring activities and to deal with the contractor through the executing agencies.

8.7. Provisional Budget for ESA Implementation

This section of the ESA presents a consolidated budget estimate for the implementation of the ESA. The budget components include: implementing agency safeguards capacity development activities; training program for all relevant entities (see Table 8.4 above) to implement their ESA responsibilities; allowances for the preparation of subproject ESIA, EMPs, RAPs, etc.; and annual reviews. Table 8.5, below, presents a provisional estimate of the budget needed to implement the ESA.

Table 8.5: Provisional ESA Implementation Budget

Item	Description	Amount (USD)
1	Hiring of Safeguards Specialist(s) for AIT	450,000
2	Implementing Agency safeguards capacity development	200,000
3	Training for various relevant stakeholder groups	260,000
4	Allowances for preparation of subproject safeguard documents	300,000
5	Annual reviews	200,000
6	Equipment for Safeguards Team	100,000
7	Vehicles (3No)	300,000
8	Operating Cost	200,000
9	Sensitization & Grievance Management by NGO	100,000
	Total	2,110,000

The above costs will be funded from TSIP Sub-Component 3.3. Costs related to the required mitigation measures for TSIP subprojects are not set out in the budgets presented here. These will be assessed and internalized by sub-project specific ESIA, EMP, RAP and ARAP as part of the overall subproject cost. It is extremely difficult to estimate the proportion of project costs that can be expected to be devoted to mitigation measures. However, a rough rule of thumb is that it can be estimated to cost between 3% and 5% of the total project cost.

With respect to resettlement/rehabilitation, all TSIP subproject specific RAPs will include a budget and identification of source of funding for payment of compensation. The RAPs will also include a time table for the payment of such compensation. Counterpart funding from the Government of Ghana will be used to fund resettlement/rehabilitation cost of road projects.

8.8. Grievance Redress Mechanism

The implementing agencies (MRH, MOT, GHA, and DFR) will be responsive to the concerns of the people affected by TSIP operations as it recognizes that, unsatisfactory handling of the effects of developmental projects may lead to upheavals and social discontent, which may trigger negative public reactions, thereby affecting project implementation.

Consistent with World Bank safeguard policies (particularly OP 4.10 and OP 4.12), accessible procedures appropriate to the context of projects/subprojects will be instituted to address grievances in the affected communities arising from project implementation. The implementing agencies and contracting entities will establish

information and grievance management systems as part of the environmental and social management planning of TSIP operations.

8.8.1. Features of Grievance Redress System

Both formal and informal grievance resolution mechanisms will be employed. TSIP Grievance Redress Mechanism (GRM) will be set up with the following features:

- **Multiple Uptake Points:** To build trust and confidence in the GRM, complainants will be provided with multiple channels to submit their complaints. These include, among others, postal mail, electronic messages, telephone, SMS, personal delivery/walk-in, or through the mainstream and social media. A TSIP implementing agency-level project GRM hotline will be established to be managed by the respective environmental and social safeguards Focal Person of the implementing agency and the contracting entity.
- **Timely resolution at the lowest possible level:** All TSIP operations will strive to attend to complaints in a timely manner and at the lowest level of operation to the extent practicable. To do this, each subproject will designate a GRM contact person (Grievance Resolution Officer) at the site level. In addressing and resolving complaints, the subprojects will build on existing mechanisms in the community (community leaders, local government officials, traditional justice system, etc.). It is only when the complaint is not resolved at this level that the complaint goes to the next level of the GRM for resolution.
- **System for receiving, sorting, verifying, and tracking:** A simple computer-based system will be developed for more effective management of complaints to guide the implementing agency/contracting entity, particularly the environmental and social safeguards unit, on the steps and arrangements for receiving, sorting, verifying, acting and tracking complaints. These will be detailed out in the project-specific ESIA's and EMP's and project operational manual. Complaints will be categorized and actions on the complaints will depend on the complaint category. All TSIP subprojects will maintain a database documenting the salient details of complaints, including the dates they were received and when and what actions were taken. These documents will be available to the external monitoring team and the World Bank. The subprojects will monitor complaints and coordinate with the concerned host local government units (LGUs) and relevant government agencies as needed to resolve them adequately and expeditiously. MRH, MOT, GHA, DUR and DFR will keep the EPA and the World Bank Task Team informed about significant complaints and the steps taken to resolve them through routine supervision and provide details in progress reports provided to the EPA and the World Bank.
- **Publicly disclosed and easily accessible.** The complaints/grievance redress arrangements will be publicly disclosed so that people are aware of where and how complaints will be managed. The GRM contact person (GRO) assigned to specific projects will further ensure that people in the project's area of influence are aware of grievance management arrangements.

Complaints will be written, ideally, but if received verbally, the project contact person will ensure written documentation is made and that the complaint is dated and recorded.

8.8.2. Grievance Redress Structure

The Grievance Redress structure will constitute the following:

1. Each TSIP subproject will designate a site-based Grievance Resolution Officer (GRO) who will be the first point of contact and for resolution of grievances. The GRO will work closely with the leadership and representatives of project affected communities and individuals, drawing on the existing local systems to preempt and resolve grievances.
2. There will be constituted for all TSIP subprojects an ad hoc District-level Grievance Redress Committee (GRC) for each district affected by any subproject. The GRC will mediate all grievances that remain unresolved after site-based or local community level interventions. The membership of the GRC will draw from nominated representatives of project affected communities and persons, the highest traditional authority in the district, the district administration, religious/faith-based organizations, NGOs and the project implementing agency and Contracting Entity.
3. The Project Implementation Team (PIT) and the Steering Committee will constitute a third level grievance redress mechanism. Grievances that remain unresolved after intervention of the GRC will be referred to this level for resolution.
4. The Commission for Human Rights and Administrative Justice (CHRAJ) and/or the courts will constitute the fourth level grievance redress mechanism. Any of the parties affected by a grievance have the liberty to resort to CHRAJ or the courts for resolution of their concerns.

8.8.3. Procedure for Handling Grievances

Consensus and negotiations are central to addressing grievances. In general, people are aware of their rights, their commitments to the country as citizens and their allegiance to village and family issues. For this reason, many Government funded development projects have been implemented without obstacles from project affected persons.

However some projects have been known to stall due to unaddressed complaints and grievances from project affected person(s) and communities. Prior negotiations, between implementing agencies and project beneficiaries, are therefore crucial to the success or failure of the projects. As a guiding principle emphasis will be placed on simplicity and proximity of the conflict resolution mechanisms to the affected persons and the following will be noted:

- a. Negotiation and agreement by consensus will provide the best avenue to resolving any grievances expressed by the individuals or households or communities affected by TSIP subprojects.
- b. The project execution teams will ensure that the main parties involved achieve any consensus freely. The relevant implementing agency and/or Contracting Entity will clearly advise the general public, as to who is responsible for the activity and the procedure for handling grievances or complaints.
- c. Complaints and grievances will be addressed at all stages of the TSIP road project process as they occur. If a suitable solution is not found, the project execution teams will defer consent of the project and the concerned project activities will not be allowed to proceed.

Action taken to address complaints and grievances will follow one of the following:

- Direct resolution, if the grievance is with a direct activity of the project, and within the remit of the project to resolve.

- Referral to a mediation body appropriate to the nature of the grievance, e.g., community elders, traditional authority, Area Council, District Assembly, etc.
- Detail case and pass to a higher authority with appropriate power to resolve or mediate. If this authority is outside of the project's own institutional structure, the case must in parallel be notified to an equivalent level within the project structure, which can follow up with the authority in question.

The procedure for handling grievances under this ESA will be as follows:

- 1) All grievances (irrespective of mode of receipt or level where lodged) will be referred to the site-based Grievance Resolution Officer (GRO) for resolution. A grievance form will be completed for all grievances received and logged into the site-based grievance system for tracking. If the affected person appears in person, the affected person should file his/her grievance in writing. The grievance form should be signed and dated by the aggrieved person. Where the affected person is unable to write, s/he should be assisted to complete the grievance form and emboss the form with his/her thumbprint. A sample Grievance Report Form is included as Annex 20.
- 2) The GRO will respond within 10 working days during which time any meetings and discussions to be held with the aggrieved person(s) should be conducted. The GRO may draw on existing mechanisms in the community (community leaders, local government officials, traditional justice system, etc.) in his attempt to address the grievance. If for any reason the resolution would require longer than 10 working days, the aggrieved person must be notified by the GRO that his/her complaint is being considered but would take longer and an estimated completion date shared.
- 3) If the aggrieved person does not receive a response or is not satisfied with the outcome within the agreed time the grievance is escalated/lodged to the District level Grievance Redress Committee (GRC).
- 4) The GRC will then attempt to resolve the problem (through dialogue and negotiation) within 15 working days of the complaint being escalated/lodged. The GRC will attempt to redress the matter through mediation according to traditional methods of mediation/conflict resolution. The resolution will then be documented on the relevant consent forms and verified.
- 5) If an agreement cannot be reached at District GRC level the aggrieved party or parties will raise their concerns to the Implementing Agency and/or Contracting Entity who shall refer the matter to the Project Implementation Team and Steering Committee for redress.
- 6) The Project Implementation Team or Steering Committee will have 15 working days to address the grievance to the satisfaction of the affected person(s). If no agreement is reached at this stage, then the grievance is taken to the Commission for Human Rights and Administrative Justice (CHRAJ) or the court, whose verdict will be binding on the parties.

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ANNEXES

Annex 1: Undertakings Requiring Registration and Environmental Permit (Ghana EPA)(Schedule 1 & 2 of EA Regulations)

Sector	Sub sector	Description
Agriculture	Community Pastures	Involving the clearing of land greater than 40 ha Involving the clearing of land located in an environmentally sensitive area
	Fruit and other vegetable farms	Management areas: Involving the clearing of land greater than 40 ha Involving the clearing of land located in an environmentally sensitive area
Fishing and Trapping	Fishing	a. fish or shell fish farming in salt water, brackish water or fresh water, where the proposal includes the construction of shore-based facilities other than wharves; b. permanent traps or weir fisheries, salt water.
	Services incidental to fishing	Fish or shellfish breeding and propagating services, or fish or shellfish hatchery services, where the proposal includes the construction of shore based facilities other than wharves.
Logging and Forestry	Logging	Management of forested land for the primary purpose of harvesting timber in a contract area.
	Forestry Services	a. application of pesticides; b. introduction of exotic species of animals, plants or microbial agents.
Mining	Metal Mining Non metal mining	
CRUDE OIL AND NATURAL GAS	Crude oil or petroleum production facilities Natural gas production facilities	
QUARRIES AND SAND PITS	Stone quarries	Where the total area is greater than 10ha, OR Where any portion is to be located within an environmentally portioned area
	Sand and gravel pit	a. where the total area is greater than 10 hectares, or b. where any portion is to be located within an environmentally sensitive area
Food	Meat and poultry products	a. abattoirs; b. meat, fat or oil processing facilities c. poultry processing facilities
	Fish products	
	Flours, prepared cereal foods and feeds Feed mills	
Beverages	Distillery products Brewery products Wines	
Rubber Products	a. tyres and tubes;	

	b. rubber hoses and beltings; c. other rubber products	
Plastic Products	a. tyres and tubes; b. rubber hoses and beltings; c. other rubber products	
Leather and Allied Products	Man made fibres and filament yarns Spun yarns and woven cloths Broad knitted fabrics	
Textile Products	Natural fibres processing and felt products Carpets, mats and rugs Canvas and related products Other textile products	
Wood	Sawmill, planing mill and shingle mill products industries Veneers and plywoods Other wood products Wood preservation facilities which use hazardous chemicals or similar chemical processes Particle board or wafer board production	
PAPER AND ALLIED PRODUCTS	Pulp and paper Asphalt roofing Other converted paper Products	
Primary Metals		
Fabricated Metal Products		
Transportation Equipment		
Refined Petroleum Products	Agricultural chemicals Plastics and synthetic resins Paints and varnishes Soaps and cleaning compounds Other chemical products	
Other Manufacturing	Scientific and professional Equipment	Photographic films and plates manufacturing Floor tiles, linoleum and coated fabrics manufacturing Other manufacturing products
Construction	Industrial Construction (other than buildings)	a) Construction of pipelines for the transmission of oil, natural gas and other related products from the source to the point of distribution, where: Any portion of the pipeline is to be located at a distance greater than 500m from an existing right of way; or

		Any portion of the pipeline is to be located in an environmentally sensitive area b) diesel electric power generating plants having capacity greater than 1 megawatt a gas turbine electric power generating plants having capacity greater than 1 megawatt c) nuclear electric power generating plants
Highways and Heavy Construction	Roads	
	Waterworks and sewage system	Construction of trunk pipelines for transmission of water from the source to the point of distribution Construction of trunk sewer pipelines Construction of trunk sewer pipeline outfalls
	Hydroelectric power plants and related structures	Construction of dams and associated reservoirs Inter or intra basin water transfers Construction of hydroelectric power developments
Utilities		Establishment of waste disposal sites Establishment of facilities for the collection or disposal of hazardous waste materials
WHOLESALE TRADE	Petroleum products	Wholesale establishment of petroleum products storage facilities
	Waste materials, wholesale	Establishment of facilities for the purpose of assembling, breaking up, sorting or wholesale trading of scrap, junk or waste material of any type
SERVICES	Economic services Administration	Resource conservation and management programmes involving introduction of exotic species of animals or plants for any purpose; Resource conservation and management programmes involving introduction of native species of animals or plants into areas where those species do not occur at the time of the proposed introduction Designation of land for cottage development or other recreational development
ACCOMMODATION SERVICES	Establishment of recreation and vacation camps	
AMUSEMENT AND RECREATIONAL SERVICES	Commercial spectator sport	Establishment of horse racetrack operations Establishment of racetrack operations for motorized vehicle sports and recreation clubs and services Establishment of facilities, including trails Establishment of outdoor firearm ranges Establishment of marina operations Establishment of facilities, including trails for mortised recreational vehicles Other amusement and recreational services

Annex 1B: Environmentally Sensitive Areas – Schedule 5 of EPA EA Regulations

NB: *Projects sited in these areas could have significant effects on the environment and the EPA could require a more stringent environmental assessment*

All areas declared by law as national parks, watershed reserves, forest reserves, wildlife reserves and sanctuaries including sacred groves

Areas with potential tourist value

Areas which constitute the habitat of any endangered or threatened species of indigenous wildlife (flora and fauna)

Areas of unique historic, religious, cultural, archeological, scientific or educational interest

Areas which provide space, food, and materials for people practicing a traditional style of life

Areas prone to disaster (geological hazards, floods, rainstorms, earthquakes, landslides, volcanic activity etc)

Areas prone to bushfires

Areas classified as prime agricultural areas

Recharge areas of aquifers

Water bodies characterized by one or any combination of the following conditions:

Tapped for domestic purposes

Within controlled/ protected areas

Which support wildlife and fishery activities

Mangrove areas characterized by one or any combination of the following conditions:

With primary pristine and dense growth

Adjoining mouth of major river system

Near or adjacent to traditional fishing grounds

Which acts as natural buffers against shore erosion, strong winds and storm floods

Estuaries and lagoons

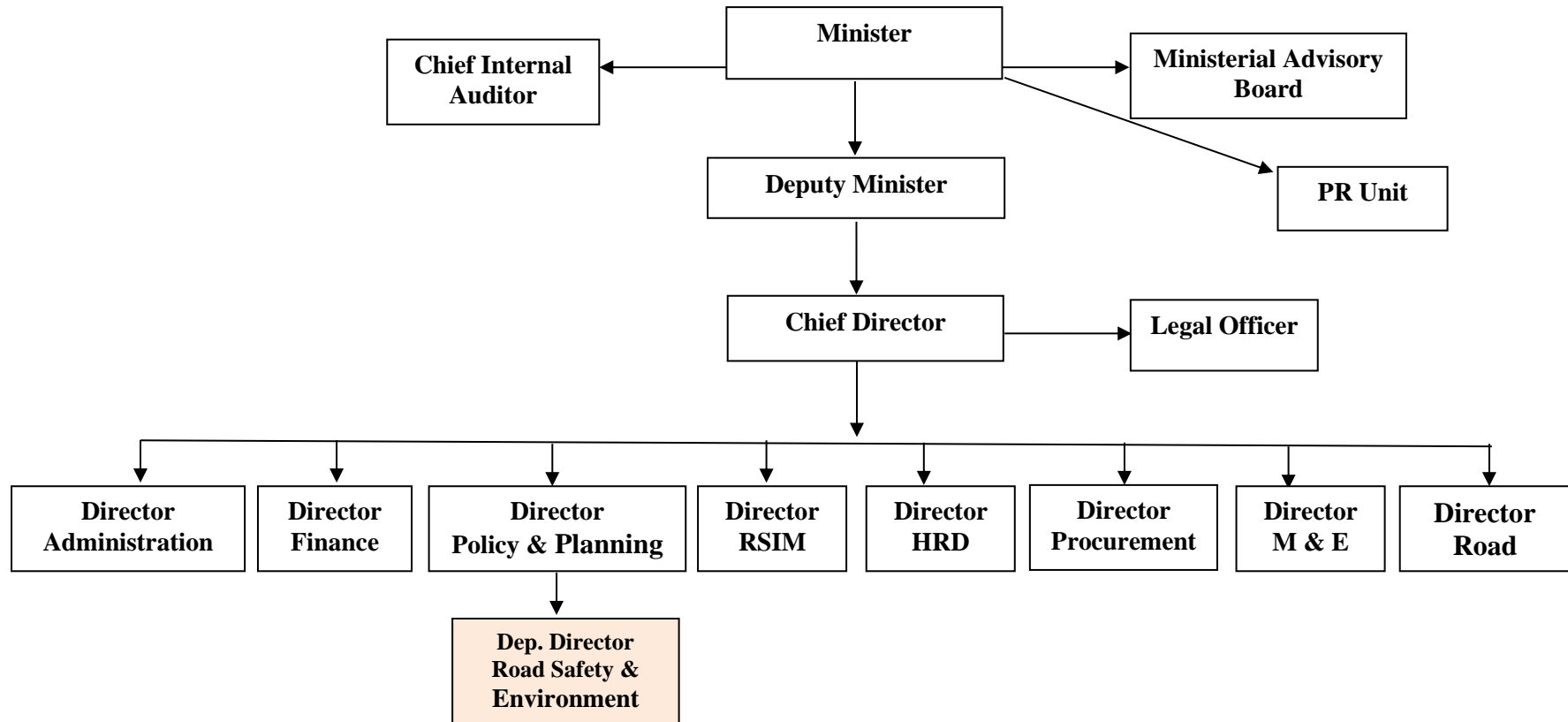
Other coastal areas of ecological, fisheries or tourism importance or which are subject to dynamic change

Wetlands

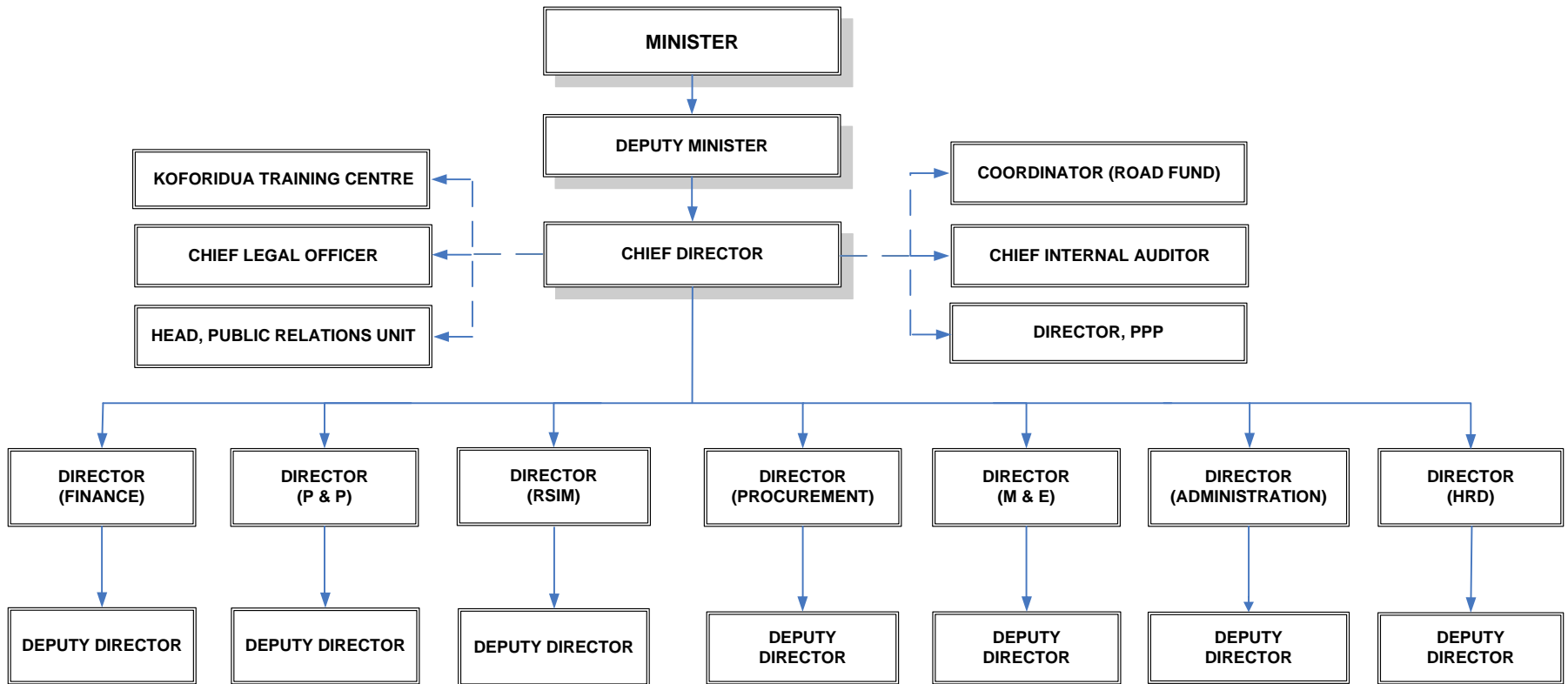
Rivers

Areas of high population density

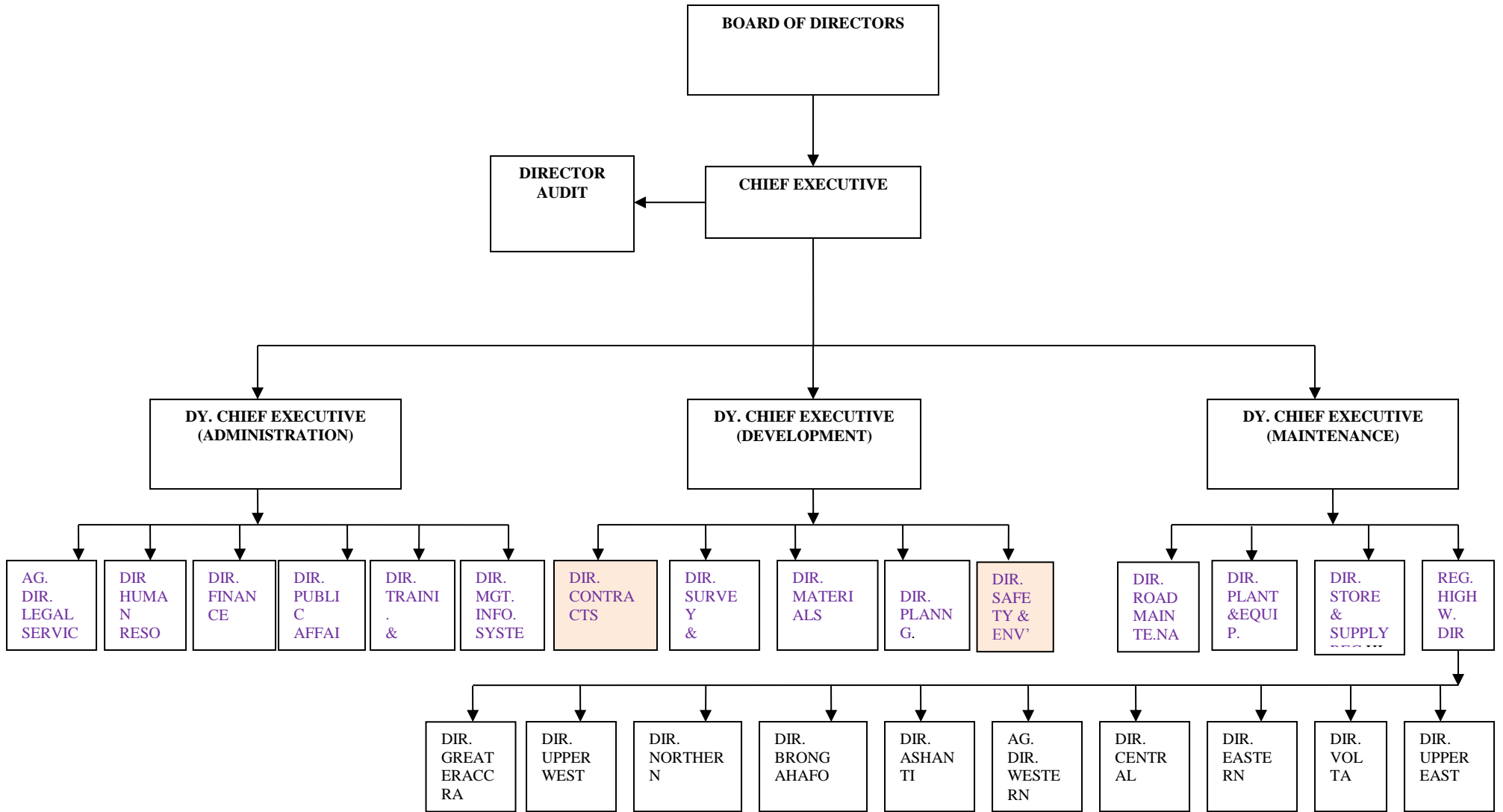
ANNEX 2: Organisational Structure of the Ministry of Transport



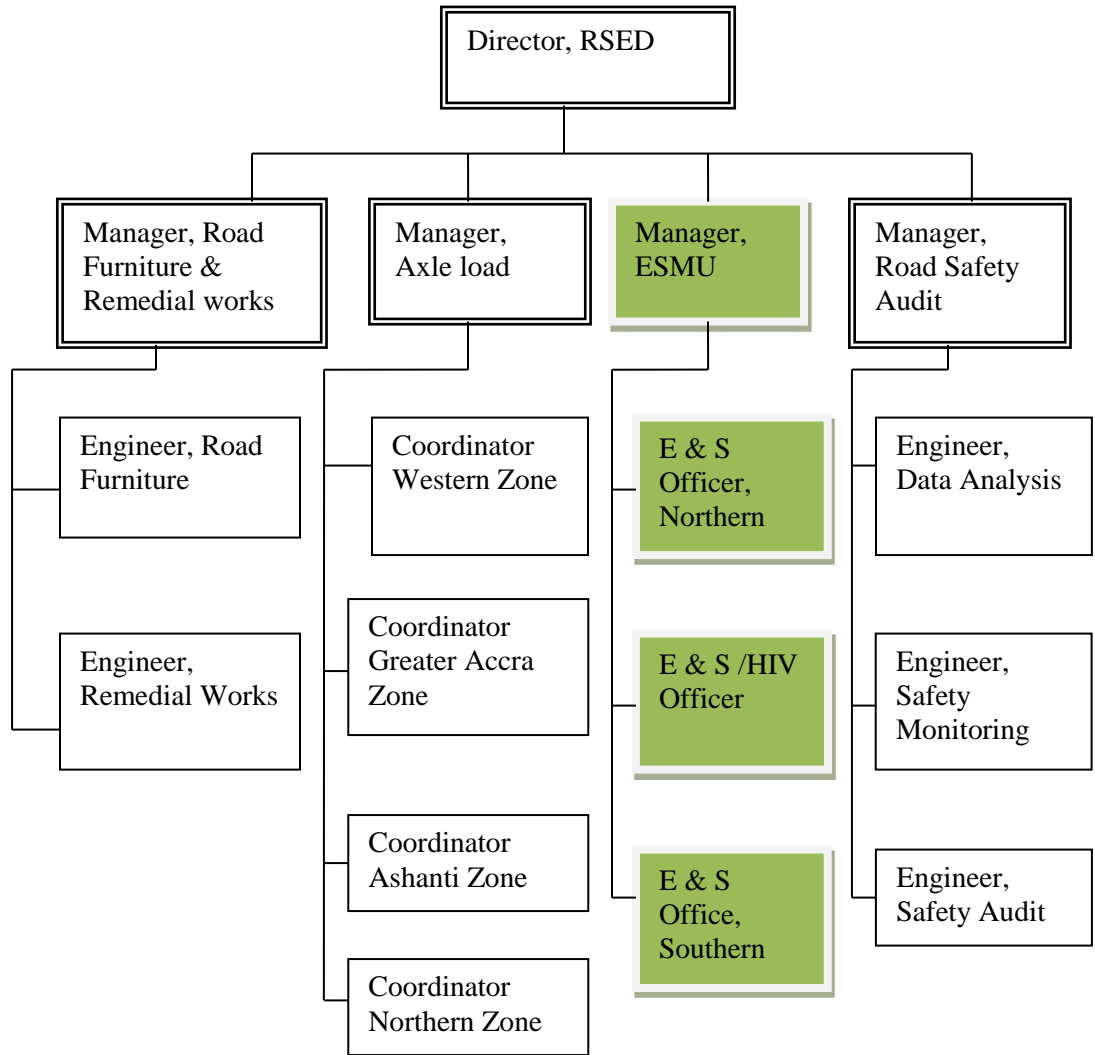
ANNEX 3: Organisational structure of Ministry of Roads and Highways



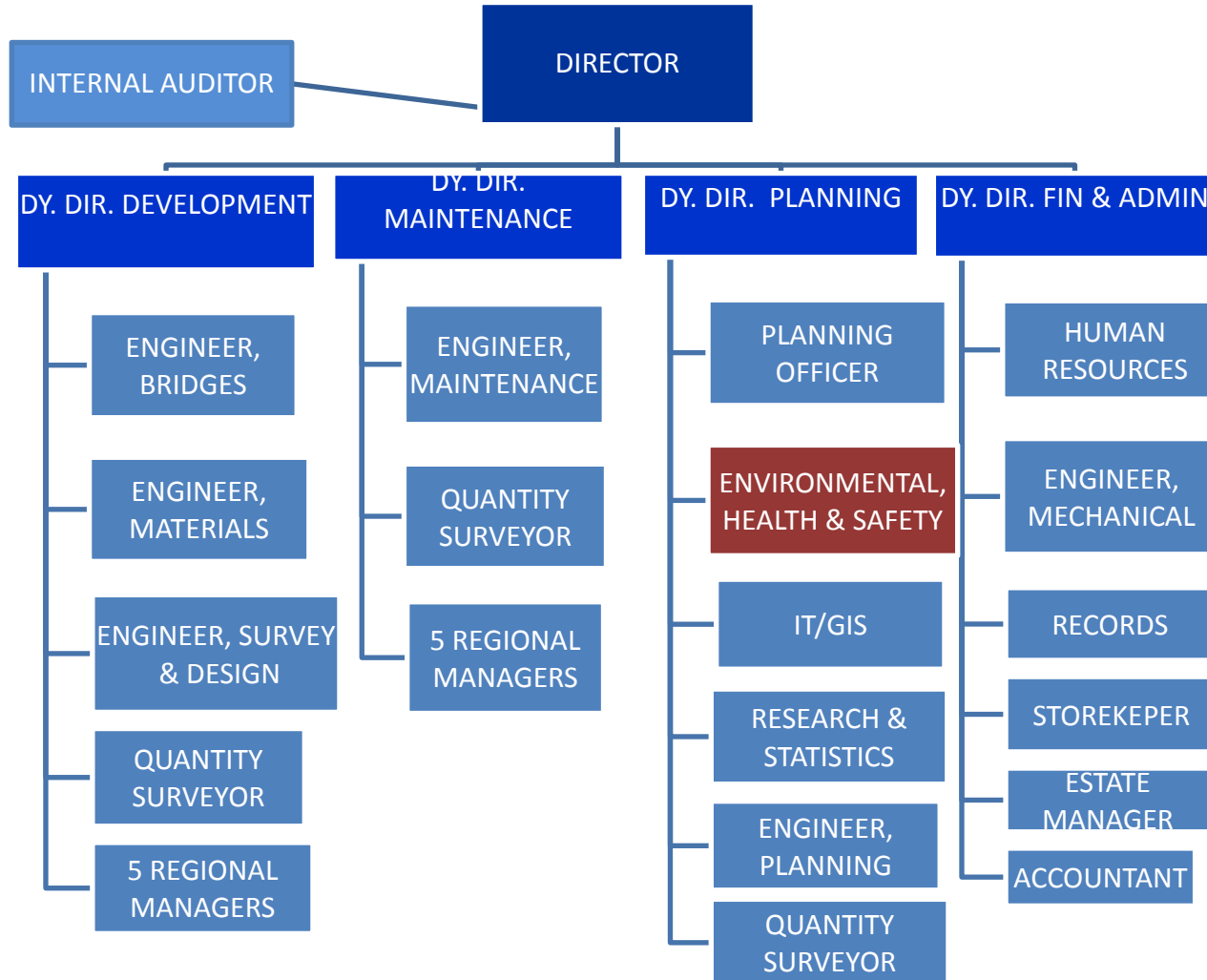
ANNEX 4: Ghana Highway Authority Organizational Structure



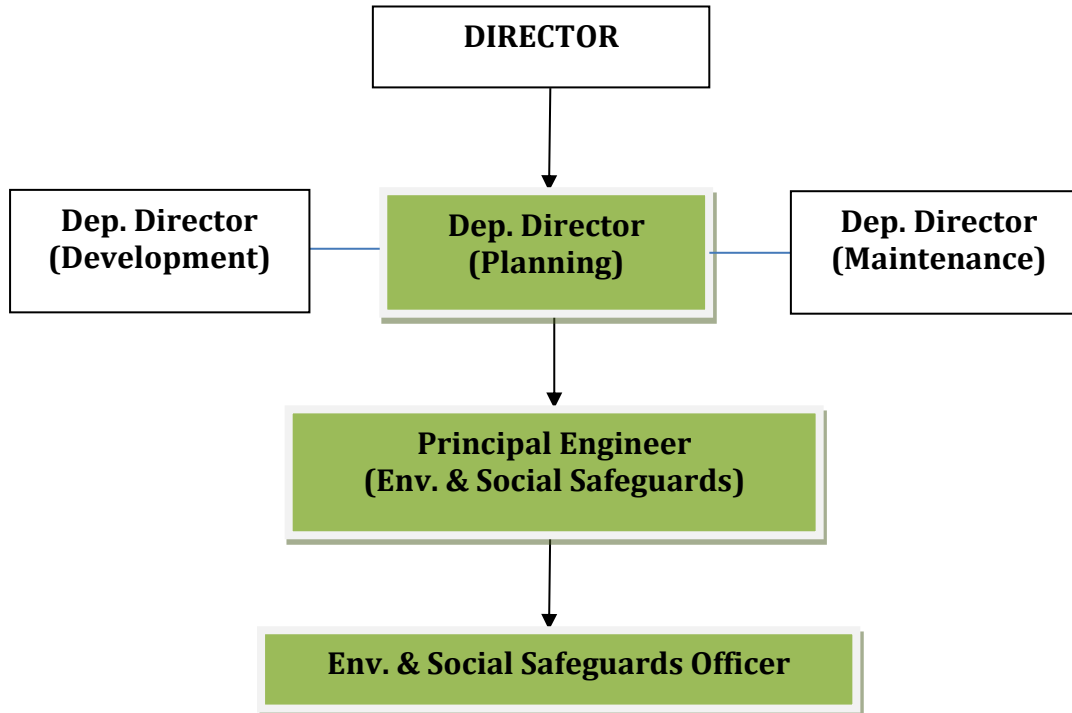
Annex 4a: Organogram of Road Safety & Environment Department – GHA



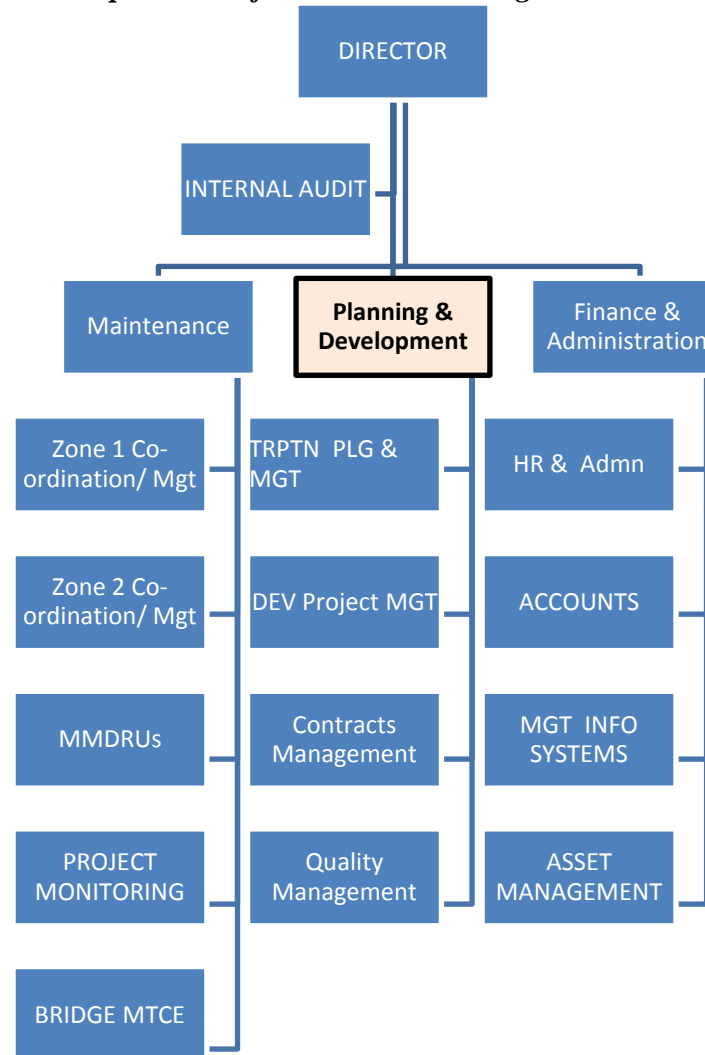
ANNEX 5: Department of Feeder Roads –Organisational Structure



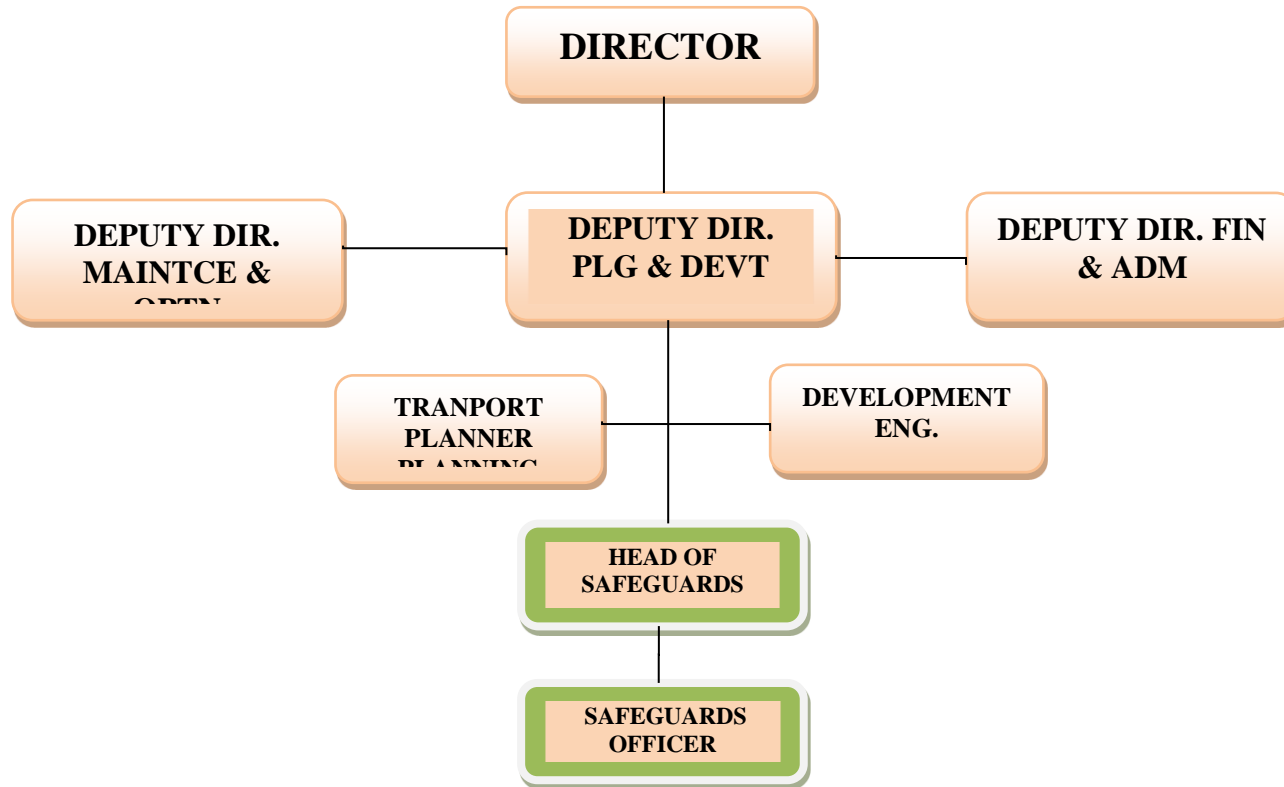
ANNEX 5a: Organogram of Environmental, Health & Safety Unit - DFR



ANNEX 6: Department of Urban Roads – Organizational Structure



ANNEX 6a: Organogram of Safeguards Unit of DUR



ANNEX 7: Total Road Network Coverage

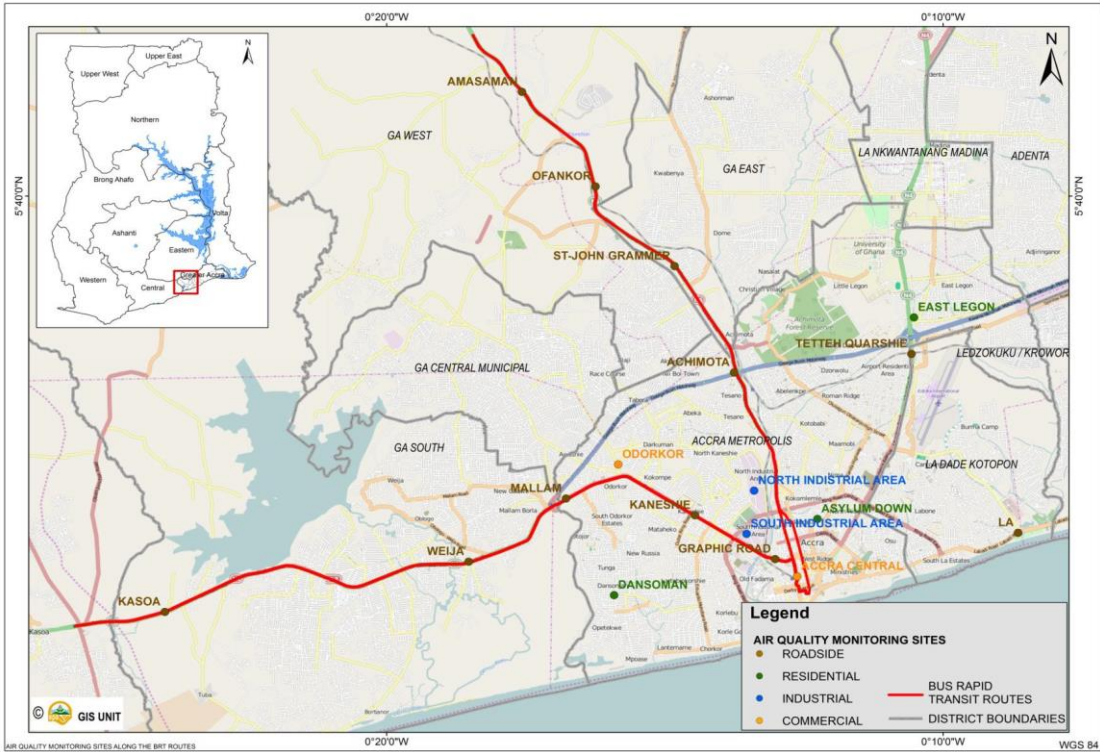


Source: Road Sector SMTDP 2014 – 2017, MRH

ANNEX 8: Description of Protected Areas in Ghana

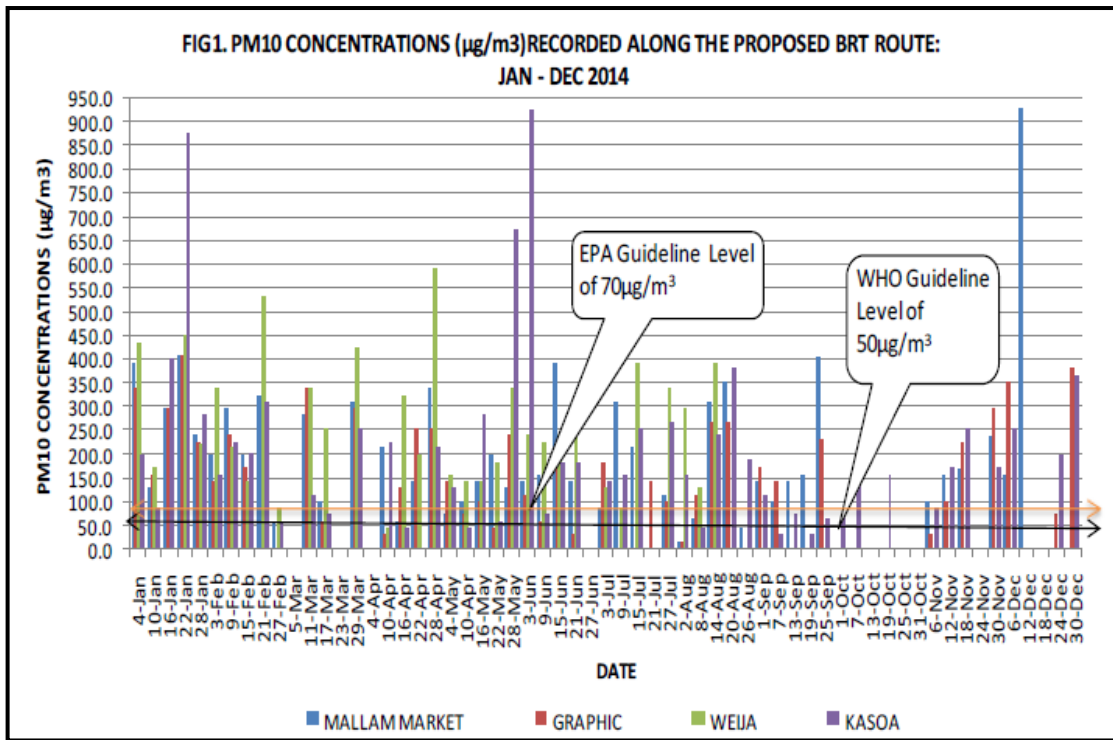
Typology	Area	Comments
Off-Reserve Areas	201,000 km ²	Off-reserve areas are lands which are currently (or were) forests but where the policy presumption is that these lands would be converted to other use – in particular, agriculture. This includes 5,000 km ² of unreserved forests, 60,000 km ² of bush fallow, 71,000 km ² of bush fallow, 36,000 km ² of unimproved pasture, and 29,000 km ² of tree and annual crop land
Forest Reserves	26,000 km ²	Areas which have been designated as forest reserves where no farming is allowed (except for in “admitted” farms, that were usually present at the time of reservation of the forest).
Dedicated Forests	4 km ²	Dedicated forests are designed to enable communities to manage their own forest ‘reserves’ based on approved management plans. These are in the form of patches of forests, sacred groves and secondary forests in off-reserve areas. Under a pilot scheme, a forest management scheme was initiated in 1994 for two communities in the Fosu district with declared Dedicated Forests (215 ha & 190 ha). The results led to draft legislation and a programme to promote dedicated forests was formulated in 1997.
Sacred Groves	Unknown	There are numerous sacred groves throughout Ghana. These are managed wholly by communities but they have no legal status and are extremely small in most instances.
Protected Areas (National Parks)	10,500 km ²	Generally a large and relatively undisturbed area of outstanding natural value containing representative samples of major natural regions, features or scenery and containing one or several entire ecosystems and not materially altered by man (or reflecting longstanding cultural land management practices). The areas should be accessible to the public, have high recreational, educational, inspirational and cultural potential of clear benefit to the local people, the region and the nation.
Resource Reserves (Game Production Reserve)	1,664 km ²	Areas of variable size in which habitats are managed to guarantee conditions essential to the well being of selected species for the sustained production of wildlife products (meat, timber, pasture, fruits, honey and other Non Timber Forest Products (NTFPs) for cultural practices, tourism and trophy hunting. These areas may be managed by a central authority, or through agreement, by other levels of government, special trusts or local community institutions as appropriate under the overall supervision of Ghana Wildlife Department.
Wildlife Sanctuaries	66km ²	Wildlife sanctuaries can be created on state land or local land. There is a revenue sharing mechanism at Agumatsa Wildlife Sanctuary in place. (Community 57%, FC 23% and Hohoe Dist Assembly 20%)
CREMACommunity Resource Management Area	30km ²	The Community Resources Management Area is a legally recognized unit of management that is capable of managing the wildlife resources within the defined area. Devolution of authority to the CREMA to the Executive Committee is conditional and confers the right to restrict access to the common property and extra-farm resources. This provides the incentives for sustainable management of wildlife resources. So far 19 CREMAs have received the authority to manage their resources.
Globally Significant Biodiversity Areas- GSBAs	2,302 km ²	Legally established globally significant biodiversity areas identified within the existing forest reserve system, forming a potential network of thirty forest reserves which are proposed for either full (11 reserves) or partial (19 reserves) protection to provide global security for floristic diversity, these include GSBAs and Southern Dry Forests the Provenance Protection Areas.
Strict Nature Reserve (SNR)	385 km ²	Only 1 Strict Nature reserve, Kogyae, has been created. Originally created from a Forest Reserve it was taken over by the WD in 1971 and established as an IUCN Category I strict nature reserve. However, the WD has been unable to evict a number of farms and settlements that have occurred within the reserve.
Ramsar Sites	1,784 km ²	6 Ramsar sites are listed as wetland sites of international importance. Under the Convention there is a general obligation for the Contracting Parties to include wetland conservation considerations in their national land-use planning. They have undertaken to formulate and implement this planning so as to promote, as far as possible, “the wise use of wetlands in their territory”

Annex 9: Air Quality Monitoring Sites in Accra



Source: EPA, Ghana

Annex 10: Air Quality Index Measurements for Accra (Jan. – Dec. 2014)



Source: EPA, Ghana

Annex 11: Ghana EPA Air Quality Guidelines

Ambient Air Quality Guidelines			
Guidelines			
Substance	Time Weighted Average (TWA)		Averaging Time
Sulphur Dioxide (SO ₂)	900 µg/m ³	Industrial	1 hr
	700 µg/m ³	Residential	1 hr
	150 µg/m ³	Industrial	24 hr
	100 µg/m ³	Residential	24 hr
	80 µg/m ³	Industrial	1 yr
	50 µg/m ³	Residential	1 yr
Nitrogen Oxides (measured as NO ₂)	400 µg/m ³	Industrial	1 hr.
	200 µg/m ³	Residential	1 hr.
	150 µg/m ³	Industrial	24 hr
	60 µg/m ³	Residential	24 hr
Total Suspended Particulate	230 µg/m ³	Industrial	24 hr
	150 µg/m ³	Residential	24 hr
	75 µg/m ³	Industrial	1 yr
	60 µg/m ³	Residential	1 yr
PM ₁₀	70 µg/m ³		24 hr
Smoke	150 µg/m ³	Industrial	24 hr
	100 µg/m ³	Residential	24 hr
	50 µg/m ³	Industrial	1 yr
	30 mg/m ³	Residential	1 yr
Carbon Monoxide	100 mg/m ³		15 min
	60 mg/m ³		30 min
	30 mg/m ³		1 hr
	10 mg/m ³		8 hr
Hydrogen Sulphide	150 µg/m ³		24 hr
Mercury	1 µg/m ³		1 yr
Lead	2.5 µg/m ³		1 yr
Cadmium	10 - 20 ng/m ³		1 yr
Manganese	1 µg/m ³		24 hr
Dichloromethane (Methylene Chloride)	3 mg/m ³		24 hr
1,2-Dichloroethane	0.7 mg/m ³		24 hr
Trichloroethane	1 mg/m ³		24 hr
Tetrachloroethene	5 mg/m ³		24 hr
Toluene	8 mg/m ³		24 hr

Source: EPA, Ghana

Annex 12: Sample Terms of Reference for Preparation of Project-specific ESIA and ESMP

TERMS OF REFERENCE FOR THE PREPARATION OF ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT AND ENVIRONMENTAL AND SOCIAL MANAGEMENT PLANS FOR THE ROADS UNDER THE TSIP

1.0 Introduction

The Government of the Republic of Ghana (the Government) seeks to increase the efficiency and effectiveness of the management and maintenance of the country's road network. This is motivated by the recognition that the road network constitutes the single largest asset owned by the Government, and that a less-than-optimal system for the management and maintenance of that asset generally results in huge losses for the national economy.

This occurs not only in the form of road deterioration and massive reductions in road asset value, but even more so in the form of increased vehicle operation costs (and, travel time) which have to be borne by road users and which reduce the competitiveness of Ghana in an increasingly global economy.

The Government, through the Ghana Highways Authority (GHA) and the Department of Feeder Roads (DFR) of the Ministry of Roads and Highways (MRH), intends to replace traditional methods of road rehabilitation and reconstruction with well-known modern concept of performance-based contracting and instruments for the management and maintenance of two specific packages of roads, which are:

- (i) Tamale-Yendi-Zabzugu-Tatale Road (about 118 km of paved and 63 km of unpaved roads to Togo border managed by GHA) and depending on the availability of funds, replacement of some temporary bridges; and
- (ii) Rehabilitation / maintenance of about 150-200 km of feeder and farm road network in each of the Brong Ahafo, Northern, Upper East, and Upper West Regions.

This is expected to minimize the pace of deterioration of road assets and ensure that road users benefit from a sustained level of service, adequacy for their needs, and at the same time reduce the cost for providing and maintaining these road networks at the required service levels.

The assignment will be managed by the GHA with the DFR providing support and inputs throughout the study period.

This draft Terms of Reference (ToR) shall serve as a guide to the preparation of project specific Environmental and Social Impact Assessment (ESIA) and Environmental and Social Management Plans (ESMPs) for the proposed projects.

2.0 Background

Output- and performance-based contracting for roads is a concept designed to increase the efficiency and effectiveness of road asset management and maintenance operations. It ensures that the physical condition of the roads under the contract is adequate for the need of road users over the entire contract period which is normally several years. This type of contract significantly expands the role of the private sector, from the simple execution of works to the management and conservation of road assets over the duration of the contract period.

In traditional contracts for road works, the Contracting Entity is responsible for the execution of works which are normally defined by the Employer, and the Contracting Entity is paid on the basis of unit rates for different work items (i.e., a contract based on "inputs" to the works). While this modality often brings improvement over force-account practices, the results are in many cases less-than-optimal. The problem is that the Contracting Entity has the wrong incentive, which is to carry out the maximum amount of works, in order to maximize its turnover and profits. Under this traditional way of "contracting out" works, it has been observed that even if a lot of work is carried out and much money is spent, the overall service quality for the road user depends on the quality of the design given to the Contracting Entity who is not accountable for it and the results are sometimes not satisfactory.

The OPRC contracting model establishes road asset management in a manner similar to the Design, Build, Maintain, Operate and Transfer (DBOMT) contracting model which addresses the issue of inadequate incentives.

3.0 Project Component

The GHA/DFR is in the process of engaging the services of a qualified consulting firm to undertake the assessment study to collect baseline engineering and other data along the identified road network links to result in the prioritization of the Feeder roads. The Consultant shall prepare concept designs for the selected Feeder roads together with the Tamale-Yendi-Zabzugu-Tatale road to determine the specific components of the project roads to be rehabilitated and maintained.

4.0 Objectives

The Consultant shall in consultation with GHA and DFR and based on the conceptual road design, conduct and prepare an Environmental and Social Impact Assessment (ESIA) and an Environmental and Social Management Plan (ESMP) as well as Resettlement Action Plan (RAP) for the Tamale – Yendi – Tatale roads. Environmental and Social Management Plans (ESMPs) and Resettlement Action Plans (RAPs) shall also be prepared for each of the Feeder Roads packages.

These reports shall be prepared in accordance with this ESA and Resettlement Policy Framework (RPF).

5.0 Scope of Services

The Consultant is required to carry out an ESIA study which shall include an environmental and social management plan ESMP in accordance with the provision of EPA Act 490, the attached ESA and RPF and the World Bank Safeguard Policies. The project is classified as a Category B project as per the World Bank criteria.

The consultant's scope of services shall include the following:

- **Task 1 - Detailed Description of the Proposed Project:** This shall include a brief description of the relevant parts of the project, using maps (at appropriate scale) photos and diagrams, where necessary. The report should include a concise description of the project's geographic, ecological, social and temporal features, road alignment, ROW, potential adjustment to alignments including potential widening, repairs / replacement of culverts, bridges, improvements to drainage, location of villages, townships and settlements along the alignment, etc. The description should include forest areas, nature reserves, parks, rivers, irrigation systems, major agriculture schemes, etc. pre-construction, construction, operation and maintenance activities, project life span and required offsite investment.
- **Task 2 - Policy, Legal and Administrative Framework:** Describe the pertinent regulations and standards governing the preparation of ESIA/ESMP and applicable to this study. They should include regulations and standards / guidelines governing environmental quality, health and safety, protection of sensitive areas, protection of endangered species, siting of construction work, land use control, etc., at national, regional and local levels including the application of the World Bank's Safeguard Policies. The report should identify locations where activities such as setting up of borrow sites, dumping sites, labour camps, quarries and sites for stock piling, storage or any other facility siting related to the project are prohibited within protected areas or forest reserves. Where the country's environmental standards are inadequate or non-existent, recommend how to upgrade or substitute them.
- **Task 3 - Description of the Environment:** Assemble, evaluate, and present baseline data on the relevant environmental characteristics of the study area. Include information on any changes anticipated before the project commences.
 - (a) Physical environment: lakes and rivers; geology; topography; soil; land degradation; climate; ambient air quality; existing water pollution discharges; and groundwater and receiving water quality. Include current and proposed development activities such as hospitals, schools, market places, etc. within the project area.
 - (b) Biological environment: flora, fauna, forest reserves, natural resources, cultural areas if any; species of commercial and local importance.
 - (c) Socio-cultural environment (include both present and projected where appropriate): population; land use; planned development activities; community structure; employment; distribution of income, goods and services; recreation; public health; cultural properties; dependence on local natural resources.
- **Task 4 - Determination of the Potential Impacts of the Proposed Project:** In this analysis, distinguish between significant positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts. Identify impacts, which are unavoidable or irreversible. Distinguish between significant and insignificant impacts as well. Wherever possible, describe impacts quantitatively, in terms of environmental and social costs and benefits. Assign economic values when feasible. Characterize the extent and quality of available data, explaining significant information deficiencies and any uncertainties associated with predictions of

impact. Impacts associated but not limited to waste disposal caused by construction workers, cutting of trees and demographic changes should be included. Identify impacts on the livelihoods of rural communities, especially the marginalized poor. Identify impacts giving special attention to the following:

(a) Air Quality and Noise: Noise and air pollution (including dust) from asphalt plants; construction equipment, vehicular traffic, rock crushers and blasting.

(b) Modification to Landscape: Access roads, landslides; soil erosion; borrow areas, roadside litter; material for road construction (quarries); alteration of natural relief; change in natural drainage pattern.

(c) Hydrology: crossing of rivers, streams, canals and ravines; temporary closure / diversion of water flow (e.g. due to culvert / bridge rehabilitation/construction); impacts due to proposed realignments; erosion; modifications to natural drainage patterns and groundwater elevation; flash-flooding.

(d) Water Quality: sedimentation of surface water bodies (river/stream and lakes); surface and groundwater pollution from fuel and oil spills; water pollution from spills or accumulated contaminants on road surfaces.

(e) Biological: impacts on flora and fauna and biodiversity caused by access to and settlements in natural resource areas; impacts on wetlands; hunting and poaching/wood-cutting from protected forests; removal of existing trees along the roadsides.

(f) Socio-economic: loss of agricultural and residual lands; loss of water sources for drinking and agriculture purposes; unplanned settlements; noise; threat to cultural and historical sites or artifacts; degradation of aesthetic value; degradation of road side environment owing to ribbon development.

(g) Displacement and Resettlement: displacement of private and public institutions and utilities; displacement of settlements, businesses and properties; problems with resettlement of households, businesses and utilities.

(h) Human health and safety: transmission of diseases; noise disturbance; air pollution; road accidents; traffic congestion and safety issues due to influx of construction traffic.

(i) Climate Change Risk Assessment: Identify the potential impacts of current and future climate change on the project. Identify the potential for the project to reduce climate change impact.

(j) Labor Influx Risk Assessment: Assess potential impacts of workers camps and temporary labor influx on existing public service, Gender based violence and child labor, assessment of pre-existing social issues such as ethnic conflict, crime etc.

(k) Gender Analysis: analysis of the local cultural and societal gender-based roles and responsibilities; potential gender issues of the proposed project and mitigation measures, assessment of the national gender policy and institutions especially at the local level to address project gender concerns etc.

- **Task 5 - Public Consultation and Disclosure:** The Consultant will identify all people affected by construction and operational activities and will facilitate dissemination of information to relevant authorities and interested and affected

parties, NGOs, Government Departments and agencies that may have a stake in the Project. The Consultation will prepare and implement a stakeholder consultation plan providing opportunity to the interested stakeholders to voice their opinion and concerns. The outcome of the consultation process, timing of the consultation, method of consultation (media announcement, town hall meetings, questionnaires, etc.) shall be documented and the results of the consultation summarized in the report.

- **Task 6: Development of an Environmental and Social Management Plan**, with a focus on three generic areas: Mitigation measures, institutional arrangements, and monitoring. The emphasis on each of these areas depends on the needs in the specific project context, as identified by the ESIA.
 - **Mitigation of environmental and social impacts**: Identify and recommend cost effective preventive actions and or measures to eliminate, reduce or mitigate the potential adverse environmental and social impacts of the project to acceptable levels. Estimate the impacts and cost of those measures. Consider compensation for affected parties for impacts, which cannot be mitigated. The plan should include proposed work programs, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures.
 - **Institutional Arrangements**: Identify institutional needs to implement environmental management plan recommendations. Review the capacity and capability of institutions at local, regional, and national levels to implement the project and recommend actions to strengthen them so that the management and monitoring plans in the environmental assessment can be implemented. The recommendations may extend to agencies or agency functions, inter-sectoral arrangements, management procedures and training, staffing, operation and maintenance training, budgeting, and financial support. The recommendations should indicate clear responsibilities, staffing and training requirements and provide full costs of implementation. Include an estimate of capital and operating costs of monitoring and training and institutional strengthening needed to carry it out the plan.
 - **Monitoring**: Prepare detailed plans for monitoring implementation of mitigating measures and the impacts of the project during the construction and operational phases.
- **Task 7 - Report**: The environmental and social impact assessment report should be concise and limited to identifying significant environmental and social issues including emerging issues. The main text should focus on findings, conclusions and recommended actions, supported by summaries of the data collected and citations for any references used in interpreting those data. The information should be supported by maps, diagrams, photos, etc.

Annex 13: Environmental Assessment and Management Activities Performed by Agency Safeguard Staff

	EA & EM Activities	MRH		GHA				DUR		DFR		Comments
		Prin. Eng.	Asst. Dev.	Chief Eng.	Chief Envt.	Sen. Envt.	Engineer	Prin. Plan.	Asst. Envt.	Prin. Eng.	Engineer	
1	Planning phase activities	Y								Y	Y	
2	Design/engineering									Y	Y	
3	Proposal preparation for EA consultants	Y						Y		Y	Y	
4	Providing Guidance to EA consultant & for the EA work	Y		Y				Y		Y	Y	
5	Registering road projects with EPA			Y		Y		Y	Y	Y	Y	
6	Screening of road projects			Y				Y		Y	Y	
7	Preparing Scoping with TOR for EIA studies			Y				Y				
8	Submission/review of Scoping Report and acceptance of TOR			Y				Y	Y	Y	Y	
9	Organ. Public Consultation, Public Hearing, Doc. Disclosure			Y		Y		Y	Y	Y	Y	
10	Handling Resettlement issues	Y		Y		Y	Y	Y	Y	Y	Y	
11	Handling Compensation issues	Y		Y		Y	Y	Y	Y	Y	Y	
12	Ensuring quality EA is carried out			Y				Y		Y	Y	
13	Submitting EA report for review and approval			Y		Y		Y	Y	Y	Y	
14	Payment of fees and permit collection			Y				Y	Y	Y	Y	
15	Taking custody of EA and related reports			Y				Y	Y	Y	Y	
16	Ensuring implementation of mitigations, etc			Y			Y	Y	Y	Y	Y	
17	Implementing mitigations							Y		Y	Y	
18	Proposal/TOR preparation for construction contracts/contractors							Y				
19	Construction phase supervision					Y	Y			Y	Y	
20	Monitoring road projects	Y		Y		Y		Y	Y	Y	Y	
21	Reporting on findings	Y		Y			Y	Y	Y	Y	Y	

ANNEX 14: Institutional Needs Assessment

Name of Institution	Activity* (From above Questionnaire)	No. of Staff with capacity	No. Needed	Level of ability to perform	Knowledge of EA Legislation Procedure	Comments
GHA	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,18,19,20,21	3	7	4	Yes	
DUR	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21	2	4	3	Yes	
DFR	1,2,3,4,5,6,7,8,9,10,11,12,13,14,15,16,17,18,19,20,21	2	4	3	Yes	
MRH	1, 3, 4, 10, 11, 20, 21	1	3	4	Yes	

**The numbers (under “Activity”) represent the type of EA/EM function performed by the Institutions/Agencies as in Column 2 of preceding Annex 13.*

ANNEX 15: ESA Questionnaire

SAFEGUARDS APPLICATION CAPACITY ASSESSMENT QUESTIONNAIRE

**Environmental and Social Assessment (ESA)
For the Road Transport Sector Improvement Project (TSIP)**

Purpose

The purpose of this questionnaire is to explore:

- Safeguards implementation capacity or awareness within the relevant road sector institutions generally;
- The existing capacity and/or availability to facilitate the application of or compliance with the safeguards;
- Capacity in the private sector to provide competent safeguards services under the road sector; and
- Opportunities for enhanced institutional collaboration and elicit input on the scope of required capacity building and training for effective safeguards application.

The responses provided to the questionnaire will be treated confidential and used only for the above purpose

General Information

- A1. Institution/Department (*Name*).....
- A2. Respondent's Name (*optional*)..... Position.....
- A3. Respondent's Highest Qualification
- A4. Respondent's Unit/Section.....
- A5. Unit/Section Responsible for EA/EM.....

General Knowledge of EA Instruments

B1. Are you conversant with the main Environmental Assessment (EA) legislation, procedures and framework applicable to the road transport sector?

	EA Instruments / Documents	Are you aware of this?	Have you used it in the past	Purpose for using it (Comments)
1	EPA Act, 1994 (Act 490)	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
2	EA Regulations, 1999 (LI 1652)	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
3	Ghana EIA Procedures	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
4	Resettlement Policy Framework (MRH)	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	
5	World Bank's Environmental &	Yes <input type="checkbox"/> No <input type="checkbox"/>	Yes <input type="checkbox"/> No <input type="checkbox"/>	

	Social Safeguards Policies (OP/BP 4.01 & OP/BP 4.12)			
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B2. List any other relevant legislation/requirement/information source important to the road sector (on environment and social issues)

.....

EA / EM Functions and Capacity Needs

C1. Which of the following EA / EM activities or functions are performed by your Department/ Organisation?

	Tick	EA & EM Activities	Comments
1	<input type="checkbox"/>	Planning phase activities	
2	<input type="checkbox"/>	Design/engineering	
3	<input type="checkbox"/>	Proposal preparation for EA consultants	
4	<input type="checkbox"/>	Providing Guidance to EA consultant & for the EA work	
5	<input type="checkbox"/>	Registering road projects with EPA	
6	<input type="checkbox"/>	Screening of road projects	
7	<input type="checkbox"/>	Preparing Scoping with TOR for EIA studies	
8	<input type="checkbox"/>	Submission/review of Scoping Report and acceptance of TOR	
9	<input type="checkbox"/>	Organising Public Consultation, Public Hearing, document disclosure	
10	<input type="checkbox"/>	Handling Resettlement issues	
11	<input type="checkbox"/>	Handling Compensation issues	
12	<input type="checkbox"/>	Ensuring quality EA is carried out	
13	<input type="checkbox"/>	Submitting EA report for review and approval	
14	<input type="checkbox"/>	Payment of fees and permit collection	
15	<input type="checkbox"/>	Taking custody of EA and related reports	
16	<input type="checkbox"/>	Ensuring implementation of mitigations, etc	
17	<input type="checkbox"/>	Implementing mitigations	
18	<input type="checkbox"/>	Proposal/TOR preparation for construction contracts/contractors	
19	<input type="checkbox"/>	Construction phase supervision	
20	<input type="checkbox"/>	Monitoring road projects	
21	<input type="checkbox"/>	Reporting on findings	

22	<input type="checkbox"/>	Please specify any other	
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C2. Which of the above activities are you personally engaged in? (*state the numbers representing the activities*).....

C3. Rank adequacy of existing capacity to perform EA functions

	Capacity to perform EA functions	Rank with "5" as highest					If ranking is below "4" suggest capacity building required
		1	2	3	4	5	
1	Rate your capacity to adequately handle your functions						
2	Rate the ability of relevant officials in your institution to perform EA functions						
3	Rate the ability of officials of other relevant institutions to performing their required EA functions						
4	Rate the ability of private sector experts (consultants) offering EA services to handle EA						

C4. Please state number of staff in your institution with EA / EM capacity

	Staff Capacity	Formal Training	On the Job Learning	Comments
1	Number of staff with EA/EM capacity			
2	Number needed (considered adequate) to handle EA/EM in the institution			

Road Infrastructure/Services and related EAs

D1. Have you been involved in a road sector project? Yes No

D2. If Yes state how many

D3. What was/were your role(s)?

D5. Please specify the category of road projects and the corresponding level of EA they are subjected to.

Type of Road Activity/Service	Type of EA Applied	Indicate where compensation or resettlement involved

Environmental and Social Areas of Interest

The table below contains a list of 22 Environmental and Social parameters or concerns associated with the road transport sector.

F1. Which of these would you rank as a common and a significant occurrence, arising from road projects (with 5 as highest & 1 lowest)?

F2. Which of these would you expect to feature in the ESA?

	Environmental /Social Parameters	Common					Significant					Tick the Parameters you wish considered in the ESA
		1	2	3	4	5	1	2	3	4	5	
1	Dust											<input type="radio"/>
2	Noise											<input type="radio"/>
3	Road accidents											<input type="radio"/>
4	Public safety											<input type="radio"/>
5	Resettlement											<input type="radio"/>
6	Compensation issues/agreement											<input type="radio"/>
7	Wildlife concerns											<input type="radio"/>
8	Forestry concerns (e.g. access)											<input type="radio"/>
9	Habitat disruption											<input type="radio"/>
10	Water contamination											<input type="radio"/>
11	Stream diversion / blocking											<input type="radio"/>
12	Flooding											<input type="radio"/>
13	Run off											<input type="radio"/>
14	Induced development											<input type="radio"/>
15	Cultural concerns											<input type="radio"/>

16	Archaeological losses													○
17	Pits / trenches near roads													○
18	Inadequate drains along roads													○
19	Road construction waste generation & disposal													○
20	Top soil removal													○
21	Tree & vegetation removal													○
22	extensive construction(impact) corridor													○
<i>Please add any others</i>														

ANNEX 16: Environmental Code of Practice

The Environmental Code of Practice (ECOP) is set out to ensure that minimum environmental standards are met and that appropriate procedures are undertaken to reduce the environmental impact of various activities related to road works and services. Within 6 weeks of signing the Contract, the Contractor shall prepare an Environmental Health and Safety Management Plan (EHS-MP) to ensure the adequate management of the health, safety, environmental and social aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an EMP for the works. The EMP will serve two purposes:

- a) For the Contractor, for internal purposes, to ensure that all measures are in place for adequate EHS management, and as an operational manual for his staff.
- b) For the Client, supported where necessary, to ensure that the Contractor is fully prepared for the adequate management of the EHS aspects of the project, and as a basis for monitoring of the Contractor's EHS performance.

The Contractor's EHS-MP shall provide at least:

- A description of procedures and methods for complying with these general environmental management conditions, and any specific conditions specified in an EMP;
- A description of specific mitigation measures that will be implemented in order to minimize adverse impacts;
- A description of all planned monitoring activities (e.g. sediment discharges from burrow areas) and the reporting thereof; and
- The internal organizational, management and reporting mechanisms put in place.

The Contractor's EHS-MP will be reviewed and approved by the Client before start of the works. This review should demonstrate if the Contractor's EHS-MP covers all of the identified impacts, and has defined appropriate measures to counteract any potential impacts.

Environmental Code of Practice for Road Projects

Environmental-Social Issues	Mitigation Measures
1. Dust generation	<ul style="list-style-type: none"> • The Contractor is responsible for compliance with relevant EPA legislation with respect to ambient air quality. • The Contractor shall ensure that the generation of dust is minimized and is not perceived as a nuisance by local residents and shall implement a dust control program to maintain a safe working environment and minimize disturbances for surrounding residential areas/dwellings. • The Contractor shall implement dust suppression measures (e.g. use water spraying vehicles) as required and appropriate. • Material loads shall be suitably covered and secured during transportation to prevent the scattering of soil, sand, materials, or dust. • Exposed soil and material stockpiles shall be protected against wind erosion and the location of stockpiles shall take into consideration the prevailing wind directions and locations of sensitive receptors •
2. Air pollution	<ul style="list-style-type: none"> • All vehicles must comply with EPA regulations controlling allowable emission limits of exhaust gases.

	<ul style="list-style-type: none"> • Vehicles must undergo a regular emissions check. • There should be no burning of waste or materials on site. • Generators must have an air permit from the EPA
3. Impacts from noise and vibration	<ul style="list-style-type: none"> • The contractor is responsible for compliance with the relevant EPA legislation with respect to noise and vibration. • When needed, measures to reduce noise to acceptable levels must be implemented and could include silencers, mufflers, acoustically dampened panels or placement of noisy machines in acoustically protected areas.
4. Water pollution	<ul style="list-style-type: none"> • The Contractor must be responsible for compliance with the relevant EPA legislation relevant to wastewater discharges into watercourses. • Potable or constructed toilets must be provided on site for construction workers. Wastewater from toilets as well as kitchens, showers, sinks, etc. shall be discharged into a tank for removal from the site or discharged into municipal sewerage systems; there should be no direct discharges to any waterbody. • Wastewater over permissible values set by relevant EPA effluent standards/regulations must be collected in a tank and removed from site by licensed waste transporter and collector. • At completion of construction works, water collection tanks and septic tanks shall be covered and effectively sealed off.
5. Solid waste	<ul style="list-style-type: none"> • Before construction, a solid waste control procedure (storage, provision of bins, site clean-up schedule, bin clean-out schedule, etc.) must be prepared by Contractors and it must be carefully followed during construction activities. • Before construction, all necessary waste disposal permits or licenses must be obtained. Arrangements with a solid waste transporter should be obtained. • Measures shall be taken to reduce the potential for litter and negligent behavior with regard to the disposal of all refuse. At all places of work, the Contractor shall provide litter bins, containers and refuse collection facilities. • Solid waste may be temporarily stored on site in a designated area recommended by the Construction Supervision Consultant and approved by the MMDA/PMU's project manager. Waste storage containers shall be covered, tip-proof, weatherproof and scavenger proof. • No burning, on-site burying or dumping of solid waste shall occur. • Recyclable materials such as wooden plates for trench works, steel, scaffolding material, site holding, packaging material, etc shall be collected and separated on-site from other waste sources for reuse, for use as fill, or for sale. • If not removed off site, solid waste or construction debris shall be disposed of only at sites identified and approved by the Construction Supervision Consultant and included in the solid waste plan. Under no circumstances shall the contractor dispose of any material in watercourses.
6. Chemical or hazardous wastes	<ul style="list-style-type: none"> • Chemical waste of any kind shall be disposed of at an approved appropriate landfill site and in accordance with local legislative requirements. The Contractor shall obtain needed disposal certificates.

	<ul style="list-style-type: none"> • The removal of asbestos-containing materials or other toxic substances shall be performed and disposed of by specially trained and certified workers. • Used oil and grease shall be removed from site and sold to an approved used oil recycling company. • Used oil, lubricants, cleaning materials, etc. from the maintenance of vehicles and machinery shall be collected in holding tanks and removed from site by a specialized oil recycling company for disposal at an approved hazardous waste site. • Used oil or oil-contaminated materials that could potentially contain PCBs shall be securely stored to avoid any leakage or affecting workers. The Chemicals Section of the EPA, must be contacted for further guidance. Relevant agencies shall be promptly informed of any accidental spill or incident. • Store chemicals appropriately and with appropriate labeling • Appropriate communication and training programs should be put in place to prepare workers to recognize and respond to workplace chemical hazards Prepare and initiate a remedial action following any spill or incident. In this case, the contractor shall provide a report explaining the reasons for the spill or incident, remedial action taken, consequences/damage from the spill, and proposed corrective actions.
7. Management of dredge material / sludge	<ul style="list-style-type: none"> • Dredging plan should be established including time schedule, method statement to meet the requirements of traffic safety, public health and environmental sanitation. In order to ensure dredging that is consistent with environmental regulations, key decision makers (MMDA, EPA, etc.) must be involved and concur in each key decision point in the process leading to preparation and implementation of a plan. • Characteristics of sludge/sediment should be determined by sampling and analysis. Sludge that is heavily contaminated would require measures that go beyond the scope of these ECOPs. • Ensure that dredged material management plans incorporate environmental considerations in the identification of short-term and long-term disposal alternatives, consider methods to reduce dredging, and maximize the beneficial use of dredged materials. • Dredging work should be conducted when water flow is high to allow the dredged materials can be separated into the sediment and the supernatant water (i.e., spoil) by settling. • Leachate from dredged materials should not be allowed to enter watercourses without appropriate filtering or treatment. • Collected dredged materials have to be processed, as per EPA regulations on waste collection, to ensure safe and environmentally secure transportation, storage, treatment and management • Those involved in handling of sludge should be specialized and have previous experience in sludge handling.

	<ul style="list-style-type: none"> Sanitary landfills site should meet technical requirements, based on level of potential contamination
8. Traffic management	<ul style="list-style-type: none"> Before construction, carry out consultations with local government and community and with traffic police (MTTU). A traffic management plan must be prepared and implemented. Significant increases in number of vehicle trips must be covered in a construction plan previously approved. Routing, especially of heavy vehicles, needs to take into account sensitive sites such as schools, hospitals, and markets. Installation of lighting at night must be done if this is necessary to ensure safe traffic circulation. Place signs around the construction areas to facilitate traffic movement, provide directions to various components of the works, and provide safety advice and warning. Employing safe traffic control measures, including road/rivers/canal signs and flag persons to warn of dangerous conditions. Avoid material transportation for construction during rush hour. Passageways for pedestrians and vehicles within and outside construction areas should be segregated and provide for easy, safe, and appropriate access. Signpost shall be installed appropriately in both water-ways and roads where necessary.
9. Restoration of affected areas	<ul style="list-style-type: none"> Cleared areas such as disposal areas, site facilities, workers' camps, stockpiles areas, working platforms and any areas temporarily occupied during construction of the project works shall be restored using landscaping, adequate drainage and revegetation. Start revegetation at the earliest opportunity. Appropriate local native species of vegetation shall be selected for the planting and restoration of the natural landforms. Spoil heaps and excavated slopes shall be re-profiled to stable batters, and grassed to prevent erosion; All affected areas shall be landscaped and any necessary remedial works shall be undertaken without delay, including green-spacing, roads, bridges and other existing works Trees shall be planted at exposed land and on slopes to prevent or reduce land collapse and keep stability of slopes Soil contaminated with chemicals or hazardous substances shall be removed and transported and buried in waste disposal areas. Restore all damaged road and bridges caused by project activities
10. Worker and public safety	<ul style="list-style-type: none"> Contractor shall comply with all EPA regulations and World Bank EHS guidelines regarding worker safety. Prepare and implement action plan to cope with risk and emergency Preparation of emergency aid service at construction site Training workers on occupational safety regulations Ensure that ear pieces are provided to and used by workers who must use noisy machines, for noise control and workers protection. During demolition of existing infrastructure, workers and the general public must be protected from falling debris by measures such as chutes, traffic control, and use of restricted access zones. Install fences, barriers, dangerous warning/prohibition site around the construction area which showing potential danger to public people The contractor shall provide safety measures as installation of fences, barriers warning signs, lighting system against traffic accidents as well as other risk to people and sensitive areas. If previous assessments indicate there could be unexploded ordnance (UXO), clearance must be done by qualified personnel and as per detailed plans approved by the Construction Engineer.
11. Communication with local communities	<ul style="list-style-type: none"> Maintain open communications with the local government and concerned communities; the contractor shall coordinate with local

	<p>authorities for agreed schedules of construction activities at areas nearby sensitive places or at sensitive times (e.g., religious festival days).</p> <ul style="list-style-type: none"> • Copies of these ECOPs and of other relevant environmental safeguard documents shall be made available to local communities and to workers at the site. • Disseminate project information to affected parties (for example local authority, enterprises and affected households, etc) through community meetings before construction commencement; • Provide a community relations contact from whom interested parties can receive information on site activities, project status and project implementation results; • Provide all information, especially technical findings, in a language that is understandable to the general public and in a form of useful to interested citizens and elected officials through the preparation of fact sheets and news release, when major findings become available during project phase; • Monitor community concerns and information requirements as the project progresses; • Respond to telephone inquiries and written correspondence in a timely and accurate manner; • Inform local residents about construction and work schedules, interruption of services, traffic detour routes and provisional bus routes, blasting and demolition, as appropriate; • Notification boards shall be erected at all construction sites providing information about the project, as well as contact information about the site managers, environmental staff, health and safety staff, telephone numbers and other contact information so that any affected people can have the channel to voice their concerns and suggestions.
12. Chance find procedures	<p>If the Contractor discovers archeological sites, historical sites, remains and objects, including graveyards and/or individual graves during excavation or construction, the Contractor shall:</p> <ul style="list-style-type: none"> • Stop the construction activities in the area of the chance find; • Delineate the discovered site or area; • Secure the site to prevent any damage or loss of removable objects. In cases of removable antiquities or sensitive remains, a night guard shall be arranged until the responsible local authorities or the National Museum takes over; • Notify the Construction Supervision Consultant who in turn will notify responsible local or national authorities in charge of the Cultural Property (within 24 hours or less); • Relevant local or national authorities would be in charge of protecting and preserving the site before deciding on subsequent appropriate procedures. This would require a preliminary evaluation of the findings to be performed. The significance and importance of the findings should be assessed according to the various criteria relevant to cultural heritage; those include the aesthetic, historic, scientific or research, social and economic values; • Decisions on how to handle the finding shall be taken by the responsible authorities. This could include changes in the layout (such as when finding an irremovable remain of cultural or archeological importance) conservation, preservation, restoration and salvage; • If the cultural sites and/or relics are of high value and site preservation is recommended by the professionals and required by the cultural relics authority, the Project's Owner will need to make necessary design changes to accommodate the request and preserve the site;

	<ul style="list-style-type: none"> • Decisions concerning the management of the finding shall be communicated in writing to relevant authorities; Construction works could resume only after permission is granted from the responsible local authorities concerning safeguard of the heritage.
13. Quarrying, Earth Burrowing, etc.	<ul style="list-style-type: none"> • Prevent and minimize the impacts of quarrying, earth burrowing, piling and building of temporary construction camps and access roads on the bio physical environment, including protected areas and arable lands, local communities and their settlements. Rrestore/rehabilitate all sites to acceptable standards. • At the end of the construction phase, all construction sites shall be landscaped and rehabilitated to acceptable standards. The stated areas shall be first landscaped, dressed with topsoil and covered with tree planting, field sods or grass seeding.
14. Air Quality / Dust	<ul style="list-style-type: none"> • Asphalt plant generation (smoke, dust, smell, etc.) to meet regulatory requirements for temporary asphalt plant • Minimize exposed soil / material stockpile surfaces to wind • Install wind breaks or fences around material stockpiles, concrete batching and asphalt plants • Spray water on exposed soil surfaces and access roads • Equip asphalt plant with either baghouse or wet scrubber particulate removing system
15. Soil erosion, sediment and storm runoff control	<ul style="list-style-type: none"> • Limit ground disturbance to areas of a workable size • Schedule construction to minimize areas of soil disturbance during wet seasons • Keep vegetation clearing to a minimum • Where vegetation was removed, and/or where the area is not to be paved after land contouring, re-vegetate all areas immediately after construction activity finishes. • Reduce the time excavated drainage channels remain unsupported • Use geotextile silt traps in drainage ditches and around materials stockpiles • Contain or isolate runoff from construction areas from other clean surface runoff. Clean and rehabilitate the area when construction is complete • Pass storm water run-off from construction areas through geotextile silt traps before discharge it into drainage systems. • Prohibit discharge of sediment bearing contaminated water to streams and other water bodies.

Reporting on ECOP

The Contractor shall prepare monthly progress reports to the Safeguard unit on compliance with these general conditions (make them more specific), the project EMP, and his own EHS-MP. It is expected that the Contractor's reports will include information on:

- EHS management actions/measures taken, including approvals sought from local or national authorities;
- Problems encountered in relation to EHS aspects (incidents, including delays, cost consequences, etc. as a result thereof);
- Lack of compliance with contract requirements on the part of the Contractor;
- Changes of assumptions, conditions, measures, designs and actual works in relation to EHS aspects; and
- Observations, concerns raised and/or decisions taken with regard to EHS management during site meetings.

Reporting of significant EHS incidents shall be done "as soon as practicable". Such incident reporting shall therefore be done individually. Also, the Contractor shall keep his own records on health, safety and welfare of persons, and damage to property. Copies of such records, as well as copies of incident reports, shall be included as appendices to the bi-weekly reports. Details of EHS performance shall be reported to the Client through the SE's reports to the Client.

ANNEX 17: Environmental and Social Clauses

1.0 General

- a) The Contractor shall comply with any specific Environmental Management Plan (EMP) for the works he is responsible for. The Contractor shall inform himself about such an EMP, and prepare his work strategy and plan to fully take into account relevant provisions of that EMP.
- b) The Contractor shall prepare method statements indicating the period within which he /she shall maintain status on site after completion of civil works to ensure that significant adverse impacts arising from such works have been appropriately addressed.
- c) The Contractor shall adhere to the proposed activity implementation schedule and the monitoring plan/strategy to ensure effective feedback of monitoring information to project management so that impact management can be implemented properly, and if necessary, adapt to changing and unforeseen conditions.
- d) Besides the regular inspection of the sites by the Supervising Engineer (SE) for adherence to the contract conditions and specifications, the Owner may appoint an Inspector to oversee the compliance with these environmental conditions and any proposed mitigation measures. The Environmental Protection Agency (EPA), regional environmental authorities or other relevant stake holders may carry out similar inspection duties. In all cases, as directed by the SE, the Contractor shall comply with directives from such inspectors to implement measures required to ensure the adequacy of rehabilitation measures carried out on the bio-physical environment and compensation for socio-economic disruption resulting from implementation of all works.
- e) The Contractor shall implement all measures necessary to avoid undesirable adverse environmental and social impacts wherever possible, restore work sites to acceptable standards, and abide by any environmental performance requirements specified in an EMP.
- f) If the Contractor fails to implement the approved EMP after written instruction by the Supervising Engineer (SE) to fulfil his obligation within the requested time, the Owner reserves the right to arrange through the SE for execution of the missing action by a third party on account of the Contractor.
- g) The Contractor will contact the proper agency for preparation of RAP, based on the RPF, where land is acquired, assets lost, or impact on livelihood occurs.

2.0 Dust Abatement

- a) The contractor shall minimize the effect of dust on the surrounding environment resulting from earth mixing sites, asphalt mixing sites, dispersing coal ashes, vibrating equipment, temporary access roads, etc. to ensure safety, health and the protection of workers and communities living in the vicinity of dust producing activities.
- b) During the performance of the work and any operations appurtenant thereto, the contractor shall carry out proper and efficient measures, such as sprinkling with water or other means, whenever necessary to reduce the dust nuisance, and to prevent dust which has originated from his operations from damaging crops, cultivated fields, and dwellings or causing a nuisance to persons. The contractor will be held liable for any damage resulting from dust originating from his operations.

3.0 Noise Due to Construction Activities

The contractor shall ensure the noise levels emanating from machinery, vehicles and noisy construction activities (e.g. excavation, blasting) are kept at a minimum for the safety, health and protection of workers within the vicinity of high noise levels and nearby communities. The national noise limit standard for the residential area in day time is 55 dB while at night is 45dB.

4.0 River, Stream and Creek obstruction

- a) The contractor shall ensure the existing water flow regimes in rivers, streams and other natural or irrigation channels are maintained and/or re-established where they are disrupted due to works being carried out.
- b) The contractor shall take all possible steps to prevent pollution of streams, rivers and other natural water bodies/reservoirs.
- c) Bitumen, oils, lubricants and waste water used or produced during the execution of works will not be released directly into rivers, streams, irrigation channels and other natural water bodies/reservoirs without prior treatment and also ensure that stagnant water in uncovered burrow pits is treated in the best way to avoid creating possible breeding grounds for mosquitoes.

5.0 Quarrying, Earth Burrowing, etc.

- a) Prevent and minimize the impacts of quarrying, earth burrowing, piling and building of temporary construction camps and access roads on the bio physical environment, including protected areas and arable lands, local communities and their settlements. In as much as possible restore/rehabilitate all sites to acceptable standards.

b) At the end of the construction phase, all construction sites shall be landscaped and rehabilitated to acceptable standards. The stated areas shall be first landscaped, dressed with topsoil and covered with tree planting, field sods or grass seeding.

6.0 Protection of Archaeological and Historical Sites

a) Upon discovery of ancient heritage, relics or anything that might be or is believed to be of archaeological or historical importance during the execution of works, immediately suspend activity and report such findings to the SE so that the National Museums and Monuments Board may be expeditiously contacted for fulfilment of the measures aimed at protecting such historical or archaeological resources.

b) The contractors shall take the necessary measures to prevent any person or equipment that may damage the article or things and shall provide barricades, fences, and signals and, if necessary, protect against atmospheric agents, as directed by the engineer, also guard service may be required by the engineer.

c) The supervising engineer shall take the following measures:

- Notify the National Museums and Monuments Board
- Request that a representative make a site inspection;
- Cessation of work in the vicinity of the find until the visit of the representative; and
- Decision by the National Museums and Monuments Board on possible salvage or excavation within 48-72-hours of notification.

7.0 Vegetation and Wildlife

a) Discourage construction workers from engaging in the exploitation of natural resources such as hunting, fishing, and collection of forest products or any other activity that might have a negative impact on the social and economic welfare of the local communities.

b) The contractor shall care, in planning, constructing, maintaining and operating temporary works such as camps, roads, spoil, stockpile and construction facilities areas, to avoid unnecessary damage to areas of particular environmental interest, such as patches of remaining forest, valuable trees and erosion of sensitive areas, as well as areas in which the presence of wildlife has been noted.

c) In case some part of a forest or single trees have to be removed, or where erosion problems that may affect some portion of the permanent or temporary works are expected, and in any case where in the engineer's opinion it is beneficial for land conservation, the contractor may be required to carry out landscaping, seeding and planting of trees, as well as executing drainages and water control works according to the prescriptions contained in the pertinent sections of these specifications.

d) No valuable trees or crops shall be damaged or removed by the contractor during the execution of the works without the prior consent of the engineer.

e) Hunting in the proximity of camps and facilities and in general in the project area is strictly prohibited, even if allowed by local rules or regulation in force in Ghana and/or in the project region.

8.0 Use of Materials

The contractor, in as much as possible, shall use local materials to avoid importation of foreign material and long distance transportation.

9.0 Worksite/Camp Site Waste Management

a) All vessels (drums, containers, bags, etc.) containing oil/fuel/surfacing materials and other hazardous chemicals shall be banded in order to contain spillage. Used oil and hydraulic fluid generated on the construction sites must be collected in a closed container and stored temporarily in a safe place and sent to an authorized recycling depot.

b) All drainage and effluent from storage areas, workshops and camp sites shall be captured and treated before being discharged into the drainage system in line with applicable government water pollution control regulations.

c) The contractor shall take all possible steps to prevent pollution of streams, rivers, and other water supplies, at or in the vicinity of the site and shall comply with applicable laws, orders and regulations in force in Ghana concerning the control and abatement of water pollution.

d) Entry of runoff to the site shall be restricted by constructing diversion channels or holding structures such as banks, drains, dams, etc. to reduce the potential of soil erosion and water pollution.

e) Construction waste shall not be left in stockpiles along the road, but removed and reused or disposed of on a daily basis.

f) If disposal sites for clean spoil are necessary, they shall be located in areas, approved by the SE, for landfill and where they will not result in material being easily washed into drainage channels. Whenever possible, spoil materials should be placed in low lying areas and should be compacted and dressed with top soil and then planted with species indigenous to the locality.

g) The contractor shall provide all sanitary facilities (e.g. garbage collection and disposal, drinking water facilities, etc.) in construction workers' camps.

10.0 Material Excavation and Deposit

a) The Contractor shall obtain appropriate licenses/permits from relevant authorities to operate quarries or burrow areas.

b) The location of quarries and burrow areas shall be subject to approval by relevant local and national authorities, including traditional authorities if the land on which the quarry or burrow areas fall in traditional land.

c) New extraction sites:

- Shall not be located in the vicinity of settlement areas, cultural and historical sites, wetlands or any other valued ecosystem component, or on high or steep ground or in areas of high scenic value.
- Shall not be located in archaeological areas. Excavations in the vicinity of such areas shall proceed with great care and shall be done in the presence of government authorities having a mandate for their protection.
- Shall not be located in forest reserves. However, where there are no other alternatives, permission shall be obtained from the appropriate authorities and an environmental impact study shall be conducted.
- Shall be rehabilitated. Areas with minimal vegetation cover such as flat and bare ground, or areas covered with grass only or covered with shrubs less than 1.5m in height, are preferred.
- Shall have clearly demarcated and marked boundaries to minimize vegetation clearing and to avoid any unnecessary damage on other resources.

d) Vegetation clearing shall be restricted to the area required for safe operation of construction work. Vegetation clearing shall not be done more than two months in advance of operations.

e) Stockpile areas shall be located in areas where trees can act as buffers to prevent dust pollution. Perimeter drains shall be built around stockpile areas. Sediment and other pollutant traps shall be located at drainage exits.

f) The Contractor shall deposit any excess material in accordance with the principles of these general conditions, and any applicable EMP, in areas approved by local authorities and/or the SE.

g) Areas for depositing hazardous materials such as contaminated liquid and solid materials shall be approved by the SE and appropriate local and/or national authorities before the commencement of work. Use of existing, approved sites shall be preferred over the establishment of new sites.

11.0 Rehabilitation and Soil Erosion Prevention

a) To the extent practicable, the Contractor shall rehabilitate the site progressively so that the rate of rehabilitation is similar to the rate of construction.

b) Always remove and retain topsoil for subsequent rehabilitation. Soils shall not be stripped when they are wet as this can lead to soil compaction and loss of structure.

c) Topsoil shall not be stored in large heaps. Low mounds of no more than 1 to 2m high are recommended.

d) Re-vegetate the stockpiles with recommended grass species to protect the soil from erosion, discourage weeds, and maintain an active population of beneficial soil microbes.

e) Locate stockpiles where they will not be disturbed by future construction activities.

f) The contractor shall reinstate natural drainage patterns where they have been altered or impaired.

g) The contractor shall collect toxic materials from construction areas and keep them protected in designated sites until proper disposal. Backfill excavated areas with soils or overburden that is free of foreign material that could pollute groundwater and soil.

h) Identify potentially toxic overburden and screen with suitable material to prevent mobilization of toxins.

i) Ensure reshaped land is formed so as to be inherently stable, adequately drained and suitable for the desired long-term land use, and allow natural regeneration of vegetation.

j) Minimize the long-term visual impact by creating landforms that are compatible with the adjacent landscape.

k) Minimize erosion by wind and water both during and after the process of reinstatement.

l) Compacted surfaces shall be deep ripped to relieve compaction unless subsurface conditions dictate otherwise.

m) Re-vegetate with plant species that will control erosion, provide vegetative diversity and, through succession, contribute to a resilient ecosystem. The choice of plant species for rehabilitation shall be done in consultation with local research institutions, the Forestry Department, and the local people.

12.0 Water Resources Management

a) The Contractor shall, at all costs, avoid conflicting with water demands of local communities.

- b) Abstraction of both surface and underground water shall only be done with the consultation of the local community and after obtaining a permit from the Water Resources Commission.
- c) Abstraction of water from wetlands shall be avoided. Where necessary, permission has to be obtained from relevant authorities.
- d) No construction water containing spoils or site effluent, especially cement and oil, shall be allowed to flow into natural water drainage courses.
- e) Waste water from washing out of equipment shall not be discharged into water courses without pre treatment.
- f) Site spoils and temporary stockpiles shall be located away from the drainage system, and surface runoff shall be directed away from stockpiles to prevent erosion.

13.0 Traffic Management

- a) Location of access roads shall be done in consultation with the local community especially in important or sensitive environments. Access roads shall not traverse wetland areas or through parks, nature reserves or protected forest areas.
- b) Upon the completion of civil works, all access roads shall be ripped and rehabilitated.
- c) Access roads shall be watered regularly to suppress dust emission

14.0 Disposal of Unusable Elements

- a) Unusable materials and construction elements such as electro-mechanical equipment, pipes, accessories and demolished structures will be disposed of in a manner approved by the SE. The Contractor has to agree with the SE which elements are to be surrendered to the Client's premises, which will be recycled or reused, and which will be disposed of at approved landfill sites.
- b) Unsuitable and demolished elements shall be dismantled to a size fitting on ordinary trucks for transport.

15.0 Repair of Private Property

- a) Should the Contractor, deliberately or accidentally, damage private property, he shall repair the property to the owner's satisfaction and at his own cost. For each repair, the Contractor shall obtain from the owner a certificate that the damage has been repaired satisfactorily in order to indemnify the Client from subsequent claims.
- b) In cases where compensation for inconveniences, damage of crops etc. are claimed by the owner, the Client has to be informed by the Contractor through the SE. This compensation is in general settled under the responsibility of the Client before signing the Contract. In unforeseeable cases, the respective administrative entities of the Client will take care of compensation.

16.0 Contractor's Environment, Health and Safety Management Plan (EHS-MP)

Within 6 weeks of signing the Contract, the Contractor shall prepare an EHS-MP to ensure the adequate management of the health, safety, environmental and social aspects of the works, including implementation of the requirements of these general conditions and any specific requirements of an EMP for the works. The Contractor's EHS-MP will serve two main purposes:

- a) For the Contractor, for internal purposes, to ensure that all measures are in place for adequate EHS management, and as an operational manual for his staff.
- b) For the Client, supported where necessary by SE, to ensure that the Contractor is fully prepared for the adequate management of the EHS aspects of the project, and as a basis for monitoring of the Contractor's EHS performance. The Contractor's EHS-MP shall provide at least:
 - A description of procedures and methods for complying with these general environmental management conditions, and any specific conditions specified in an EMP;
 - A description of specific mitigation measures that will be implemented in order to minimize adverse impacts;
 - A description of all planned monitoring activities (e.g. sediment discharges from burrow areas) and the reporting thereof; and
 - The internal organizational, management and reporting mechanisms put in place.

The Contractor's EHS-MP will be reviewed and approved by the Client before start of the works. This review should demonstrate if the Contractor's EHS-MP covers all of the identified impacts, and has defined appropriate measures to counteract any potential impacts.

16.1. Health and Safety

- a) In advance of the construction work, the Contractor shall mount an awareness and hygiene campaign. Workers and local residents shall be sensitized on health risks particularly of AIDS.

- b) Adequate road signs to warn pedestrians and motorists of construction activities, diversions, etc. shall be provided at appropriate points.
- c) Construction vehicles shall not exceed a maximum speed limit of 40km per hour.

16.2. Traffic Safety

- a) Ensure public safety, and meet traffic safety requirements for the operation of work to avoid accidents.
- b) The contractor shall be responsible for the safety along the roads related to the site, and he shall take all necessary precautions for the protection of the work and the safety of the public on the roads affected by his activities.
- c) Roads subject to interference by the work shall be kept open or suitable detours shall be provided and maintained by the contractor, who shall provide, erect, and maintain all necessary barricades, suitable and sufficient flashlights, flagmen, danger signals, and signs.
- d) The contractor shall submit his weekly activities schedule and the locations of his work along the existing public roads to the authorities concerned, and obtain all necessary approvals prior to commencement of the respective work.
- e) At the road crossings or in heavy traffic locations, the contractor shall carry out the work within the working hours as directed by the engineer, and after the completion of the work he shall immediately make the necessary backfill and pavement at the crossings.
- f) The contractor shall provide temporary passes and bridges to give an access to the existing villages, houses, etc., to the satisfaction of the engineer and the authorities concerned whenever he disturbs such existing way during the execution of the works.

17.0 Reporting

The Contractor shall prepare monthly progress reports to the SE on compliance with these general conditions, the project EMP if any, and his own EHS-MP. It is expected that the Contractor's reports will include information on:

- EHS management actions/measures taken, including approvals sought from local or national authorities;
- Problems encountered in relation to EHS aspects (incidents, including delays, cost consequences, etc. as a result thereof);
- Lack of compliance with contract requirements on the part of the Contractor;
- Changes of assumptions, conditions, measures, designs and actual works in relation to EHS aspects; and
- Observations, concerns raised and/or decisions taken with regard to EHS management during site meetings.

It is advisable that reporting of significant EHS incidents be done "as soon as practicable". Such incident reporting shall therefore be done individually. Also, it is advisable that the Contractor keeps his own records on health, safety and welfare of persons, and damage to property. It is advisable to include such records, as well as copies of incident reports, as appendices to the bi-weekly reports. Details of EHS performance will be reported to the Client through the SE's reports to the Client.

18.0 Training of Contractor's Personnel

The Contractor shall provide sufficient training to his own personnel to ensure that they are all aware of the relevant aspects of these general conditions, any project EMP, and his own EHS-MP, and are able to fulfil their expected roles and functions. Specific training should be provided to those employees that have particular responsibilities associated with the implementation of the EHS-MP. General topics should be:

- EHS in general (working procedures);
- Emergency procedures; and
- Social and cultural aspects (awareness creation).

19.0 Cost of Compliance

It is expected that compliance with these conditions is already part of standard good workmanship and state-of-the-art as generally required under this Contract. The item "Compliance with Environmental Management Conditions" in the Bill of Quantities covers these costs. No other payments will be made to the Contractor for compliance with any request to avoid and/or mitigate an avoidable EHS impact.

ANNEX 18: Summary of Potential Environmental and Social Impacts and Mitigation Measures

Summary of Potential Environment and Social Impacts Associated with Road Transport Sector and Mitigation Measures			
No	Impact	Potential Source	Mitigation Measures
1	Soil Impacts Loss of productive soil elimination of the productive capacity of the soil covered by roads particularly where the site for the road development is also suitable for agriculture.	Removal of productive soil Compaction with heavy machinery during construction Burrow pits and gravel winning, Quarries Spoil dumping Site preparation and clearing	<ul style="list-style-type: none"> • Minimizing the area of ground clearance; • Avoiding sensitive alignments, including steep slopes • Progressive replanting of disturbed areas during construction not after • Terracing of nearby marginal farmland to make it more productive on the long term; • Remediation of affected soils by using a sub soils to break up hardpan produced by compaction with heavy equipment;
	Erosion	Removal of vegetation and Soil disturbance coupled with poor drainage Site preparation and clearing	<ul style="list-style-type: none"> • Specifications for contractors responsibilities to cover such issues as erosion control, prevention of fuel spills during construction, and planting as well as timely watering of plantings. • Minimizing the area of ground clearance
	Destabilization of slopes which can lead to landslides	Creation of road cuts or embankments. Excessive steepness of cut slopes, deficiency of drainage, modification of water flows,	<ul style="list-style-type: none"> • Balancing filling and cutting requirements through route choice, so as to avoid/minimize the production of excess spoil material and reduce the need for borrow pits; • Avoiding the creation of cut slopes and embankments of an angle greater than the natural angle of repose for the local soil type; and • Engineering solutions such as intercepting ditches at the tops and bottoms of slopes. Gutters and spillways are used to control the flow of water down a slope; • Terraced or stepped slopes to reduce the steepness of a slope. riprap, or rock material embedded in a slope face, sometimes combined with planting, retaining structures, such as gabions (rectangular wire baskets of rocks), etc should be explored
	Soil contamination during road construction and traffic operations.	Daily traffic operation on very busy roads. Metals from emissions such as chromium, lead, and zinc remain in the soil for hundreds of years. Pollutants settling in roadside soil can impair the growth of vegetation increasing potential for erosion.	<ul style="list-style-type: none"> • Enforcement of emission standards and introduction of control legislation and mechanism
2	Water Resources Impacts	Spillage of hazardous products in transit. Site preparation and clearing	<ul style="list-style-type: none"> • Guidelines for transport of hazardous products defining permissible routes

Summary of Potential Environment and Social Impacts Associated with Road Transport Sector and Mitigation Measures			
No	Impact	Potential Source	Mitigation Measures
	<p>Modification of flow of surface waters</p> <p>Ground water table modifications</p> <p>Water quality degradation (surface and groundwater)</p>	<p>Concentrating flows at certain points and, in some cases, increasing the speed of flow resulting in flooding, soil erosion, channel modification, and siltation of streams.</p> <p>- Earthworks Road drainage and excavation & embankments and structures can reduce or raise the water table (through restricting flow)</p> <ul style="list-style-type: none"> • Sedimentation, changes in biological activity in streams and on their banks • Uncontrolled construction activities, • Chemicals spillage • Chronic pollution of surface runoff from exhaust emissions, pavement and tyre wear, petroleum product drippage, and corrosion of metals 	<ul style="list-style-type: none"> • Emergency response procedures for spillage • Avoiding alignments which are susceptible to erosion, such as those crossing steep slopes; • Minimize the number of water crossings • Use clean fill materials around watercourses such as quarried rock containing no fine soil; and • Provide reservations/buffer zones of undisturbed vegetation between road sites and water bodies • Introduce Water speed reduction measures e.g. grasses, riprap, and other devices in water channels etc • Provide settling basins to remove silt, pollutants, and debris from road runoff water before discharge to adjoining streams or rivers • Construction of runoff channels, contouring or other means of erosion control • Pave sections of roads prone to erosion and sedimentation particularly relevant near water crossings. • Compensatory measures such as provision of bore holes and wells for communities adversely affected • Adopt environmental enhancements measures in design such as water retention structures in dry areas, and raising inlets to drainage culverts in high water table areas, retarding basins in areas prone to flooding to reduce runoff peaks, spillways
3	<p>Air Quality Impacts</p> <p>Dust</p> <p>Emissions such as Nitrogen oxides (NO_x), Hydrocarbons (HC), Carbon monoxide (CO), Sulfur dioxide (SO₂), Particulates including suspended airborne particles from diesel fuel combustion, materials produced by tyre, brake and road wear, and dust, lead (Pb) Aldehydes etc.</p>	<p>Construction-related air pollution</p> <p>Batching plants and asphalt plant operations</p> <p>Material dump sites</p> <p>Vehicular emissions</p> <p>Haulage of materials</p>	<ul style="list-style-type: none"> • Water dousing to minimize dust • Contract specifications include dust control measures • Rerouting traffic away from populated areas and reducing traffic congestion. • Provision of Bypass roads. • Covering of Hauling trucks carrying sand with canvass to avoid dust emission; • Location of material storage areas away from communities and environmentally sensitive receptors • Selecting road alignments which avoids housing, schools, and workplaces; • Avoiding placement of busy intersections, near housing, schools or workplaces;

Summary of Potential Environment and Social Impacts Associated with Road Transport Sector and Mitigation Measures			
No	Impact	Potential Source	Mitigation Measures
			<ul style="list-style-type: none"> • Taking account of prevailing wind direction when siting roads and road features, including refueling stations, near population centres; • Avoiding steep grades and sharp curves which would promote deceleration, acceleration and shifting wherever possible; • Sealing high-use dirt roads, where they pass through populated areas, to control dust; and • Planting tall, leafy, and dense vegetation between roads and human settlements to filter pollutants • Vehicle emissions standards as well as inspection and maintenance requirements;
4	<p>Habitat Destruction and disruption (flora and fauna impacts)</p> <p>Habitat loss</p> <p>Habitat fragmentation</p>	<p>Right of way and land take Road intersecting habitat, Borrow and pits, and quarries</p> <p>When a road cuts through an ecosystem it affects the ecosystem's stability and health.</p> <p>Roads tend to fragment an area into weaker ecological sub-units, thus making the whole more vulnerable to invasions and degradation.</p> <p>Corridor restrictions Accidental death and poaching of animal species.</p> <p>Aquatic habitat damage - Erosion from poorly constructed and rehabilitated sites can lead to downstream siltation, ruining spawning beds for fish.</p> <p>Constriction of flows at water crossings can make the current too fast for some species.</p> <p>Alterations of flood cycles, tidal flows, and water levels can upset trophic dynamics by affecting the life cycle of plankton, and have corresponding effects on the rest of the food chain.</p> <p>Rechanneling of waterways is often undertaken as part of road construction to avoid flooding and make crossing</p>	<ul style="list-style-type: none"> • Avoid environmentally sensitive areas to prevent severe impacts on flora and fauna. • Water crossings should be minimized, and buffer zones of undisturbed vegetation should be left between roads and watercourses. • Planting in road rights-of-way and adjacent areas can help to support local flora and fauna. • Re-engineering road cross-section designs by using narrower widths, lower vertical alignments, smaller cuts and fills, flatter side slopes, and less clearing of existing vegetation. • Provision of animal crossings to facilitate movements • Fencing or plant barriers can reduce the risk of collisions between animals and vehicles. • Provision of aquatic crossings: Culverted crossings should be designed with the needs of migratory aquatic species in mind. • Baffles might be installed to slow the flow enough to allow fish movement etc • Traffic control measures- speed limits, particularly at night and in areas of frequent animal crossing, warning signs • Roadside reflectors to scare animals away from the roadway when vehicles approach at night.

Summary of Potential Environment and Social Impacts Associated with Road Transport Sector and Mitigation Measures			
No	Impact	Potential Source	Mitigation Measures
		structures simpler. In the process, natural streambeds are dug up and useful obstructions, including large boulders, are removed.	
5	<p>Noise and Vibration</p> <p>Degradation of human welfare and hearing impairment, communication problems and leading to elevated stress levels as well as associated behavioural and health effects.</p> <p>Causing auditory fatigue, temporary and permanent loss of hearing ability, sleep disorders, and can even contribute to learning problems in children.</p> <p>Damage to roadside structures particularly makeshift or lightly constructed buildings through vibration</p> <p>Disruption of wildlife habitat and movement</p>	<p>Vehicular movement - friction between vehicle and the road surface;</p> <p>Driver behaviour- using vehicles' horns, playing loud music, shouting at each other, and causing their tyres to squeal as a result of sudden braking or acceleration.</p> <p>Construction and maintenance activities</p> <p>Asphalt plant operations</p> <p>Resonance of traffic</p> <p>Piling for interchange construction and bridges</p>	<ul style="list-style-type: none"> • Surface design and maintenance • Application of a bituminous surface layer over worn concrete roadways is effective in reducing frictional noise. • Use open-graded asphalt • Smooth, well-maintained surfaces such as freshly laid asphalt without grooves and cracks will keep noise to a minimum. • Road design should avoid steep grades and sharp corners to reduce noise resulting from acceleration, braking, gear changes, and the use of engine brakes by heavy trucks at critical locations. • Provision of Noise barriers – concrete, earth, metal, window glazing etc. • Environmental specifications for contractors - In carrying out construction, quarrying, or other such activities in noise-sensitive areas, special attention may have to be paid to equipment noise standards, hours of operation, material haulage routes, and other aspects of work-site management.
6	<p>Landscape Alteration and aesthetics</p>	<p>Lack of harmony between the road and Landscape features such as natural relief and morphology, hydrology, vegetation, recreational areas, cultural heritage sites.</p> <p>Quarrying, Borrow pits and gravel winning associated with road construction</p>	<p>Reforestation</p> <p>Landscaping of route</p> <ul style="list-style-type: none"> • Selection of alignment characteristics that best fit the route into the landscape e.g. <ul style="list-style-type: none"> □ Vertical and horizontal alignment should follow the natural relief • Reclamation of degraded lands
7.	<p>Impact on communities and economic activities</p> <p>Splitting of Communities</p>	<p>Both new roads and reconstruction requiring widening can split a community.</p> <p>Introduction of faster traffic, access controls, and median barriers generally cuts traditional lines of travel or communication in communities</p> <p>Provision of longer alternative routes for local</p>	<ul style="list-style-type: none"> • Resettlement and compensation may need to be considered for those whose housing, land; welfare or livelihood is directly affected by a project. • Take account of local movements in road design stage • Make provision for improved crossings or alternative access routes. • Provision of alternative space for displaced activities and service areas adjacent to the new routes for displaced businesses

Summary of Potential Environment and Social Impacts Associated with Road Transport Sector and Mitigation Measures			
No	Impact	Potential Source	Mitigation Measures
	<p>Loss/disruption of roadside community business and social activity</p> <p>Increased land and property values leading to higher rental values, a turnover in occupancy, and displacement of lower-income tenants</p>	<p>movements affects businesses and pedestrian movements</p> <p>Disruption of links between villagers and their farmlands by a new road or increased traffic.</p> <p>Roadside business activities including the selling of goods, small businesses such as cafes and vehicle, repair shops; bus or taxi stops can be disrupted by road const. Added to this list of activities are social activities associated with the roadside. In rural areas, in particular, but also in urban areas and at entrances to towns and villages, the roadside provides a social disruption</p> <p>People congregate along the roads to talk, smoke, drink or watch the traffic</p> <p>Increased traffic flows as a result of road improvements can increase conflicts between local activities and the efficiency and safety of traffic functions of the road.</p> <p>Further conflicts and safety concerns arise when road improvement plans call for widening the road and reducing encroachments and accesses.</p> <p>Creation of bypass roads Although by-pass roads can reduce conflict between road use and community welfare, they also can lead to loss of business and death of communities</p> <p>increased by infrastructural improvements, new roads, road improvements</p> <p>Creation of diversion routes</p>	<ul style="list-style-type: none"> • Planning of temporary traffic diversions,
8	<p>Impacts from land acquisition and resettlement</p> <p>displacement of communities loss of business, properties and incomes social stress</p>	<p>Compulsory land acquisition (expropriation of properties for public projects).</p> <p>Demolishing of structures such as houses, buildings, shops</p>	<ul style="list-style-type: none"> • Impacts on roadside land users can be avoided by choosing route locations away from built-up areas and by restricting the extent of road • Works to avoid interference with existing activities.

Summary of Potential Environment and Social Impacts Associated with Road Transport Sector and Mitigation Measures			
No	Impact	Potential Source	Mitigation Measures
	economic loss, social and psychological disruption for the affected individuals and their families.		<ul style="list-style-type: none"> • Adoption of a reduced speed design, reduced right-of-way land • Requirements, or design changes (underground drainage, for instance) can avoid impacts on properties and activities. • Compensation of owners of the land and properties on the basis of the current market rates • Resettlement of affected persons where possible
9	<p>Impact on Cultural Heritage</p> <p>Damage could affect the historic, scientific, social, and amenity values; aesthetic impacts on cultural monuments and archaeological sites;</p>	Damage caused by road construction, related works such as quarries and borrow sites, and unregulated access to cultural heritage sites.	<ul style="list-style-type: none"> • Road construction should avoid any alignment that cuts through known cultural sites • Cultural sites uncovered during road works should lead to possible realignment of the road. • In some unusual cases it is preferable to leave a cultural site buried beneath the road. • Excavation, erosion control, restoration of structural elements, rerouting of traffic, and site mapping. • Salvage excavation and relocating artifacts or ruins from a site. • Dialogue between the road department and Monuments and Museums board is required to avoid damage to cultural sites • Marking and fencing important cultural sites during the construction period
10	Waste Generation	Excavation spoils Inappropriate Construction camp design and mismanagement leading to sewage and garbage pollution; Spills from construction equipment operation and servicing. Construction waste Waste asphalt	<ul style="list-style-type: none"> • Disposal of construction related waste materials at designated waste dump site • Waste minimization measures • Waste management plan to be incorporated in road planning
11	Traffic Disruptions and interruption of local traffic	Carelessly planned detours and road closures.	<ul style="list-style-type: none"> • Provision of planned diversion routes during construction • Use of signboards and other public information mechanisms to inform public in advance of construction work and schedule
12	Utility Disruptions	Construction activities and the need to realign utility supply lines	<ul style="list-style-type: none"> • Advance public notices • Collaboration with utility providers

Summary of Potential Environment and Social Impacts Associated with Road Transport Sector and Mitigation Measures			
No	Impact	Potential Source	Mitigation Measures
			<ul style="list-style-type: none"> • Provision of alternative supplies where applicable e.g. water supply by tankers to affected communities • Restoration of utility lines and other structures damaged during the construction
13	Public Safety and Health	<p>Exposure to atmospheric emissions from construction equipment</p> <p>Exposure to excessive and continuous noise and vibration from construction activities</p> <p>Lack of warning sign and safeguards</p> <p>Influx of migrant workers and introduction of diseases such as STDs</p>	<ul style="list-style-type: none"> • Servicing of construction equipment • Use of equipment with low operating noise levels • Restricting construction works to day time hours • Introduction of traffic/speed control devices • Intensive public awareness campaigns • Provision of signboards • Provision of Diversions where possible during construction period • open ditches and other potential hazards to be properly marked with visible tapes
14	Occupational Health and Safety	Accidents from operation of construction equipment	<ul style="list-style-type: none"> • Training of workers in equipment use • Provision of personal protective equipment and clothing • Enforcement of the use of such equipment • Frequent maintenance of equipment • Safety rules for workers and their enforcement • Emergency procedures and training

ANNEX 19: Pictures of Field Consultations & Visits with Local Stakeholders along Tamale-Yendi-Tatale Corridor



Annex 20: Sample Grievance Report Form

GRIEVANCE REPORT FORM

Received by: _____ Date Received: _____

Reported by: _____ Database ID: _____

Responsible Agency: _____ Staff Name: _____

Location: _____

	Village	First Name, Last Name	Contact Details
Complainant(s)			
Local Chief			

Acknowledged by: _____ Date Acknowledged: _____

Description of Concern:

.....

Category:

Compensation / Land Access / Inadequate Notification/ Disruption to Business or Property /
 Property Damage / Irrigation / Boundary Dispute / Environmental Damage / Construction
 Activities / Safety Risk /Traffic / Other

Proposed Resolution or Feedback:

.....

Complainant satisfied with process? Yes No Why not?.....

Complainant satisfied with outcome? Yes No Why not?

Print Name (Complainant): _____

Signed (Complainant): _____ Date: _____

Signed (Recipient): _____ Date: _____

Copied to: _____