THE UNITED REPUBLIC OF TANZANIA

MINISTRY OF WORKS

TANZANIA NATIONAL ROADS AGENCY

DODOMA INTEGRATED AND SUSTAINABLE TRANSPORT PROJECT

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED IMPROVEMENT OF DODOMA RADIAL ROADS COMPRISED OF (I) IMAGE ROUND ABOUT-MKONZE 7.0KM, (II) BAHI ROUND ABOUT- MSALATO AIRPORT JUNCTION 10.7KM AND (III) CBD ROADS 5KM IN DODOMA CITY

JANUARY, 2026

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ABBREVIATIONS AND ACRONYMS

AIDS:	Acquired Immuno Deficiency Syndrome
ARI :	Acute Respiratory Infection
ASTM :	American Society for Testing and Materials (Currently ASTM International)
BP :	Borrow Pits
BS :	British Standard
CBOs :	Community Based Organisations
CO :	Carbon Monoxide
CO_2 :	Carbon Dioxide
DCC :	Dodoma City Council
DIN 430:	Standard for Stainless Steel Metal Products
DIN :	Deutsches Institüt für Normüng
DoE :	Division of Environment
DOE-VPO :	Division of Environment in the Vice President's Office
DUWASA :	Dodoma Urban Water and Sewerage Authority
EIA :	Environmental Impact Assessment
EMA :	Environmental Management Act
EMO :	Environmental Management Officer
ESIA :	Environmental and Social Impact Assessment
ESMP :	Environmental and Social Management Plan
GDP :	Gross Domestic Product
GHG :	Greenhouse Gas
GN :	Government Notice
GoT :	Government of the United Republic of Tanzania
HC :	Hydrocarbons
HIV :	Human Immune Virus
LAA :	Local Assessment Area
LGA :	Local Government Authority
LHS :	Left-Hand Side
MoW :	Ministry of Works
MoWTC :	Ministry of Works, Transport and Communications
NAC :	National Advisory Committee
NACP :	National HIV/AIDS Control Programme
NEMC :	National Environment Management Council
NGOs :	Non-Governmental Organisations
NOx :	Oxides of Nitrogen
OH&S :	Occupational Health and Safety
PDA :	Project Development Area
PLHA :	People Living with HIV-AIDS
PM_{10} :	Particulate Matter with Diameter Less than 10 Micrometres
$PM_{2.5}$:	Particulate Matter (PM) with Diameter Less than 2.5 Micrometres
PMDM :	Pavement and Materials Design Manual
R/A :	Roundabout

RAA : Regional Assessment Area
RC : Regional Commissioner
RHS : Right-Hand Side
RIAM : Rapid Impact Assessment Matrix
ROW: Right of Way
SATCC –TU: Southern Africa Transport and Communications Commission Technical Unit
SGR : Standard Gauge Railway
SIA : Social Impact Assessment
SOx : Oxides of Sulphur
STIs : Sexually Transmitted Infections
TACAIDS : Tanzania Commission for AIDS
TANESCO: Tanzania Electricity Supply Company Limited
TANROADS : Tanzania National Roads Agency
TECU : TANROADS Engineering Consulting Unit
TRC : Tanzania Railways Corporation
TRRL : Transport and Road Research Laboratory
TTCL : Tanzania Telecommunication Company Limited
TZS : Tanzania Shillings
US D : United States Dollars
VEC : Valued Environmental Components
VOC : Volatile Organic Carbons
VPO : Vice President's Office
WHO-GPA: World Health Organization Global Programme on AIDS

THE STUDY TEAM

NAME OF EXPERTS	SIGNATURES
Eng. Light Semkanga (Environmental expert and Team Leader)	
Akonda Mwangunga (Senior Environmental Expert)	
Emmanuel Simon (Social Expert)	

In this study the Environmental Expert *(Eng. Light Semkanga)* was a Team Leader responsible for conducting biophysical survey, preparation of EIA report and integration of Social Impact Assessment (SIA) report with EIA report to produce consolidated ESIA report. The Team Leader was assisted by Emmanuel Simon *(Social expert)* who was responsible for conducting Socio-economic baseline survey, stakeholder consultation meetings and preparation of SIA report as well as Akonda Mwangunga *(Senior Environmentalist)* who was responsible for environmental assessment and analysis for preparation of ESIA report.

ACKNOWLEDGEMENT

TANROADS would like to acknowledge the contribution made by various stakeholders during the study and finally during preparation of this ESIA report. The assistance provided by the local authorities during the field work is highly appreciated. Apart from providing access to useful documents they were able to assist the Consultant during the field work.

The cooperation from the infrastructure/utility authorities is also highly appreciated. The utility authorities helped the Consultant in identifying location of infrastructure/utilities that are likely to be affected during construction. Finally, but not least the Project Proponent appreciates the opinions / concerns from various stakeholders and assistance provided to the Consultant by the Ward and Village Leaders during consultation meetings with the local community members.

EXECUTIVE SUMMARY

This Environmental and Social Impact Assessment (ESIA) was undertaken for the proposed improvement of Dodoma Radial Roads under the Dodoma Integrated Sustainable Transport (DIST) Project, implemented by TANROADS with financing from the World Bank.

The assessment focuses on identifying significant environmental and social risks and defining practical mitigation and management measures.

Significant Environmental and Social Findings

The project will significantly improve traffic flow, road safety, and accessibility within Dodoma City, contributing to reduced congestion and travel time. The key adverse environmental impacts identified include temporary dust emissions, noise, construction waste generation, and localized drainage disturbances during construction. These impacts are assessed as short-term, site-specific, and manageable.

The key social risks include temporary disruption of access, impacts on roadside informal economic activities, occupational health and safety risks, traffic safety risks, and potential social risks related to labor influx, including GBV/SEA/SH and communicable diseases. The project may also involve involuntary resettlement, which has been addressed through a standalone Resettlement Action Plan (RAP).

Recommended Mitigation and Management Actions

To address the identified risks, the ESIA recommends:

- Implementation of a comprehensive Environmental and Social Management Plan (ESMP)
- Strict application of dust, noise, waste, and drainage control measures
- Preparation and enforcement of Traffic Management, Occupational Health and Safety, and Community Health and Safety Plans
- Implementation of GBV/SEA/SH prevention measures, Workers' Code of Conduct, and grievance redress mechanisms
- Compensation and livelihood restoration for all Project Affected Persons prior to construction
- Continuous stakeholder engagement and monitoring throughout construction and operation phases

Conclusion
With full implementation of the proposed mitigation measures and ESMP, the project is environmentally and socially acceptable and can proceed without significant residual impacts.

1.0 INTRODUCTION

1.1 Background

The Government of the United Republic of Tanzania has received credit from the World Bank to undertake an Economic Study, Detailed Engineering Design, Environmental and Social Impact Assessment (ESIA), and Preparation of Tender Documents for the proposed improvement of Dodoma Radial Roads in Dodoma City under the Dodoma Integrated Sustainable Transport (DIST) Project.

The sub-projects under this component include:

- CBE Junction – Ndasha – Bahi Roundabout Road (2.38 km)
- Central Roundabout – Jamatini – Ndasha Airport / Arusha Roundabout Road (2.4 km)
- Image Roundabout – SGR Station – Mkonze Village (Iringa Approach Road, 7.0 km)
- Bahi Roundabout – Wajenzi – Msalato Airport Junction (Arusha Approach Road, 10.7 km)

As part of the design process, TANROADS has undertaken the detailed engineering design, preparation of tender documents, and conducted the Environmental and Social Impact Assessment (ESIA) and Resettlement Action Plan (RAP) in compliance with both national environmental legislation and the World Bank Environmental and Social Framework (ESF)

Alongside the project designing process, TANROADS Commissioned Environmental and Social Consultants to undertake the detailed Environmental and Social Impact Assessment (ESIA) and RAP for the implementation of the road project through DIST project.

The Environmental and Social Impact Assessment (ESIA) study, in this context was conducted as per the Environmental Impact Assessment and Audit regulations (2005) and its amendment of 2018 that implement the Environmental Management Act No. 20 of 2004 as well as the WB -ESF requirements. Per these Regulations, the National Environment Management Council (NEMC) is mandated to oversee the EIA process, which culminates with an award of the EIA Certificate by the Ministry responsible for Environment. The EIA Certificate is among the prerequisite approvals required before the project takes off. Without exception, this project will need the EIA certificate before the construction of the road commences. Since the GoT soliciting funds from the WB through DIST then necessities the requirement for undertake the ESIA study to reflect the World Bank Environmental and Social Standards (ESS) of 2018 requirements including their consideration in the engineering design.

1.2 DIST Project in Dodoma

The DIST project is proposed to be implemented within Dodoma City Council to improve connectivity for users in selected areas in Dodoma and enhance institutional capacity in the urban transport sector in Tanzania to ensure safe and sustainable connectivity for all users in selected areas in Dodoma. The project under DIST will include construction and improvement of pedestrians walkways and cycling infrastructure, dedicated bus lanes as well as bus-stops, shelters, construction of dual carriageways roads with two mixed traffic lanes in each direction, road safety improvements, improved drainage infrastructure and climate

resilient design in identified low lying areas, establishment of green space corridors along the road.

The proposed road section improvement in Dodoma CBD are among the busiest road in Dodoma city that links the CBD areas with other major centers, including the Tanzanian Parliament, the College of Business Education, major commercial centers and markets, the intercity bus terminal, a planned national stadium, Magufuli Government City (the dedicated location for government city), the Tanzanian Statehouse as well as residential areas of Dodoma City.

Figure 1.1: The Google map showing the area where the proposed project will be constructed

1.3 The requirement of ESIA

The Environmental and Social Impact Assessment (ESIA) study, in this context was conducted as per the Environmental Impact Assessment and Audit regulations (2005) and its amendment of 2018 that implement the Environmental Management Act No. 20 of 2004 as well as the WB -ESF requirements. Per these Regulations, the National Environment Management Council (NEMC) is mandated to oversee the EIA process, which culminates with an award of the EIA Certificate by the Ministry responsible for Environment. The EIA Certificate is among the prerequisite approvals required before the project takes off. Without exception, this project will need the EIA certificate before the construction of the road commences. The ESIA study reflects the World Bank Environmental and Social Standards (ESS) of 2018 requirements including their consideration in the engineering design.

The ESIA of this project have been prepared as per WB-ESF requirement. Since this project will be funded by the World Bank, the following WB policies and related guidance shall be observed during design and implementation of the project and these are: The World Bank Group Environmental, Health, and Safety Guidelines for Toll Roads, WBG EHS General Guidelines, EHS Guidelines for Construction Materials Extraction (2007) and World Bank Environmental and Social Framework . The Consultation and Public Engagement, Impacts Identification and Analysis, Compensation and Relocation of the affected properties, Vulnerable Group consideration, Labour Relation aspects, Grievances Redress Mechanism, as well as Occupational Health and Safety Management have been undertaken as per requirements of the WB- ESS 1-10 of the World Bank.

The proposed road projects are likely to cause environmental and social impacts of both positive and negative nature. However, TANROADS intends to implement the roads project with minimum adverse environmental and social impacts. The environmental and social issues addressed in this ESIA report will be considered in the design (both preliminary and detailed designs stages) of the road as well as plans for construction and operation phases of the project through the implementation of the Environmental and Social Management Plan (ESMP).

1.4 Project Objectives and Rationale

1.4.1 Project Objectives

The widening/rehabilitation of road sections aims at enhancing social Economic development in terms of improvement of traffic mobility to road users, Increase in National Domestic Product (GDP), Improvement of living standards and widening the window of business opportunities to local people. This project is being conceived in line with the Government commitment to the improvement of infrastructure in the bid of stimulating economy and quality of life in Dodoma, Iringa, Arusha and Morogoro Regions.

1.4.2 Project Rationale

The road improvement through DIST, will stimulate the growth of a variety of economic activities such as agriculture, forestry, livestock keeping, beekeeping, and mining. However, these economic potentials are not fully exploited due to a lack of reliable road transport infrastructure. Also, shall lead to savings in vehicle operating costs (VOC), and travel time leading to a reduction in transport costs to the users. Furthermore, widening/rehabilitation of the road will increase the efficiency of road transport in neighboring regions and Countries. Moreover, people living along the road and neighboring villages will significantly benefit as their agricultural products will be easily transported to business centers.

1.5 Objectives of this ESIA Study

The objective of ESIA is to assess the environmental and social impacts of the proposed construction of proposed roads sections and recommend mitigation measures to address the negative and positive impacts. Specifically, this ESIA study foresee all environmental, social, health and safety effects of the proposed project design before the project come into the actual implementation. The study therefore has addressed the environmental, social, health and safety (ESHS) issues associated with the road improvement/rehabilitation projects and provides significant mitigation plan to prevent or minimize adverse impacts and enhance the positive ones.

1.6 The ESIA Study Team

In order to properly address the environmental issues, a team of experts participated in undertaking the ESIA Study. The experts were; Environmental Specialist, Highway Engineer, Hydrologist and Sociologist. The team approached the study by conducting Environmental and Social Impact Assessment (ESIA). Both teams were led by registered environmentalist. The names of the experts have been provided in the initial page of this report.

1.7 Methodology

1.7.1 Desk Study-Documents Review

This entails a detailed study of relevant literatures pertaining to the project area and proposed design. To mention a few the following documents were reviewed;

- Project Inception Report.
- Preliminary design report (Including Hydrology study, construction materials study and economic study).
- Socio-Economic Profile of Dodoma Regions
- Dodoma National Capital City Master Plan 2019-2039.
- All policies and legislations relevant to this project.

1.7.2 Stakeholders Consultations

Stakeholder consultation is at the heart of the EIA process in Tanzania. Most of the stakeholders were identified during fieldwork (December 2024). The following levels of institutions were consulted not only to gather environmental and social concerns about the project but also to inform stakeholders about the intended plans to construct the proposed project road;

- RAS-Office –Dodoma.
- Dodoma City Council.
- DUWASA.
- Ward Executive Officer (WEO) & Mtaa Executive Officer (MEO) along the project road.
- Utility Companies, TANESCO, TTCL etc.
- Community nearby project area (Project Affected People if any).
- NGO's and CBOs active in the Project Area.
- Transportation Companies.
- Industries close to the project road

The concerns of each group have been summarized in chapter-5 and the list of stakeholders consulted is attached as **APPENDX 1.** Methodology on how each group was consulted is provided in the subsequent sections;

1.7.2.1 Consultative Meetings with Regional, District Authorities and Utility Companies

Public and Officials consultations were conducted through meetings with major stakeholders of the proposed project road sections. During the fieldwork, Consultative Meetings at the Municipal level included discussions with Utility agencies, Regional officers, specialists, and other knowledgeable people and key informants. At Regional levels, RAS's office and TANROADS were consulted. Other stakeholders were TTCL, TANESCO, DUWASA. The consultations were done through direct interviews and probing, figure 1.1. Typically, the Agenda for these consultations included:

- Briefing about the Project;
- Presenting the proposed roads (using satellite Images);
- Defining the Regional institutional framework;

- Discussing recent experience in the Region with respect to compensation eligibility criteria and entitlement packages;
- Obtaining from the authorities their environmental and socio-economic concerns and perceptions regarding the proposed Row and discuss the role of the authorities in public information dissemination, monitoring and management plan.

Figure 1.2: Consultative meeting with RAS-Office –Dodoma (June 2025)

1.7.2.2 Consultative Meetings with Communities

Dissemination of Project information among communities along RoW is an important aspect of the public participation process, they need to be appropriately informed about what is planned in their area. The community consultations were conducted with the intention to;

- Provide clear and accurate information about the Project to the communities;
- Inform communities along the way leave about the Project schedule;
- Gathering from population and their representatives about main concerns and perceptions regarding the road widening;
- Gathering opinions and suggestions directly from the affected communities on their preferred mitigation measures; and
- Identify local leaders with whom further dialogue can be continued in subsequent stages of the Project.

Opinions and concerns of the various minority groups of women, children, disabled and youth on the proposed road were noted. Each meeting was hosted by local authorities and was conducted for no more than two hours; the Consultant had at least two persons present; one to act as moderator, and other to take notes for the minutes of the meeting. Maps and other visual aids were also used in the session. Agenda for these consultations included:

- Presenting the Project;
- Presenting the proposed Row (using maps);
- presenting way leave management features;

- Defining the local institutional framework and stakeholders;
- Gathering from local population their socio-economic concerns and perceptions regarding the proposed Row; and
- Facilitating in identification by the communities of the main land uses and land tenure issues along the Row.

1.7.2.3 Fieldwork and Observations

Fieldwork along the road sections involved physical survey, investigation, direct measurements, sample collection, and social-economic survey. This intended to facilitate the acquisition of information and data on physical, biological, cultural, and social-economic aspects of the project site and the neighboring area. On top of that data and information on types of houses, various properties like crops, trees, availability of infrastructure/utilities, conditions of the existing road were collected and documented.

1.7.2.4 Impacts and Risks Assessment Methodology

Superimposing project elements/activities onto the existing social and environmental natural conditions has identified the potential environmental impacts and associated risks of the proposed road development. The checklist method was used to identify the impacts. Further, the environmental impact correlation matrix method was adopted to predict impacts of major concern. A key guiding assumption in this study is that the project will be designed, constructed, operated, and maintained with due care for the safety, environmental and social matters using current and practical engineering practice and/or Best Available Technology Not Entailing Excess Cost (BATNEEC). The implementation schedule of the mitigation measures is summarized in the Environmental and Social Management Plan (ESMP).

The environmental and social assessment has been undertaken in close interaction with the engineering, planning, and design team. In this process, environmental impacts have been evaluated for various alternatives. Several project alternatives were considered including that of not implementing the project. The fundamental environmental protection strategy and environmental considerations influencing engineering design were incorporated. However, reasonable regard to technical feasibility and economic capability was taken into account. Inter alia, the assessment entailed the following:

i. Impacts and risks Identification and Evaluation

The rehabilitation of the project road can cause a wide range of environmental and social impacts and risks on several receptors. The ESIA identified these impacts to mitigate the adverse ones or enhance the benefits. Impact identification is a process designed to ensure that all potentially significant impacts are identified and taken into account in the ESIA process. Several ‘tools’ are available to assist in impact identification. The simplest, and most frequently used, are checklists of impacts, although matrices, network diagrams, and map overlays are also commonly used.

In this ESIA a checklist and matrix were used. The matrix consists of a horizontal list of development activities against a vertical list of environmental and social factors. Thus, it

identifies impacts by methodically checking each development activity against each environmental and social consideration to ascertain whether an impact is likely to occur.

ii. Identifying Mitigation and Management Options

The options for dealing with identified and predicted impacts were considered after a comprehensive evaluation. This enabled the study team to analyze proposed mitigation measures. A wide range of measures has been proposed to prevent, reduce, remedy, or compensate for each of the adverse impacts evaluated as being significant. Analysis of the implications of adopting different alternatives was done to assist in clear decision-making.

1.8 The Report Format

- **Chapter one** contains the introduction on the background information of the proposed project, its development objectives, rationale and the proposed project implementation arrangements.
- **Chapter two** contains the project description, in which there is a description of the location and relevant components of the project and their activities.
- **Chapter three** illustrates policy, legal and administrative framework, which are the relevant Tanzanian environmental policies and legislation and international guidelines and standards applicable to construction projects.
- **Chapter four** has the baseline information relevant to environmental characteristics, which gives details concerning the Bio-physical environment and socio-economic environment at the project area.
- **Chapter five** express the consultation exercise at the project area detailing the list of stakeholders consulted and the issues raised.
- **Chapter six** describes the Project alternatives as well as positive and negative environmental impact of the project that are likely to be generated from the different phases (the planning and designing, construction, operation and maintenance and the demobilization phases) and gives the mitigation measure for the potential negative impact of the project.
- **Chapter seven** gives the main conclusions of the study.
- **Chapter eight** presents the Environmental and Social Management Plan (ESMP) and presents the Environmental Monitoring Plan that contains the proposed institutions to carry out the monitoring activities, the monitoring indicators, time frame and the proposed budget for monitoring.
- **Chapter nine** gives the cost benefit analysis of the project.
- **Chapter ten** give the demobilization activities
- Chapter Eleven provides the decommissioning plan for the proposed project however the decommissioning is not anticipated in the foreseeable future.
- **Chapter** twelve provide Summary and Conclusion.
- **References of the ESIA** are provided in the last chapter.
- **Several Appendix** are also included in the report.

The appendices, containing some key primary information collected during the study are attached at the end of this report. Generally, the report structure flows in conformity with that specified in the World Bank's Guidelines for Conducting ESIA and National EIA & Environmental Audit Regulations (2005).

2.0 PROJECT DESCRIPTION

The project is located within Dodoma City, the administrative and political capital of Tanzania. A detailed description of the city's background and location is provided in Section 2.1**.** As shown in Figure 2.1 and 2.2, the project area lies within Dodoma Region, where the proposed roads traverse key urban corridors and approach roads connecting the Central Business District (CBD), Msalato Airport, and other major urban zones.

2.1 Location

The Dodoma city is located at 6°10′23″ South 35°44′31″ East Coordinates in the center of the country, the City is 453 kilometers west of the former capital at Dar es Salaam and 441 kilometers south of Arusha, the headquarters of the East African Community.

Dodoma City Council features a semi-arid climate with relatively warm temperatures throughout the year. While average highs are somewhat consistent throughout the year, average lows dip to 13ºC in July. Dodoma City receives an average of 570 mm of precipitation per year, the bulk of which occurs during its wet season between November and April. The remainder of the year comprises the city's dry season.

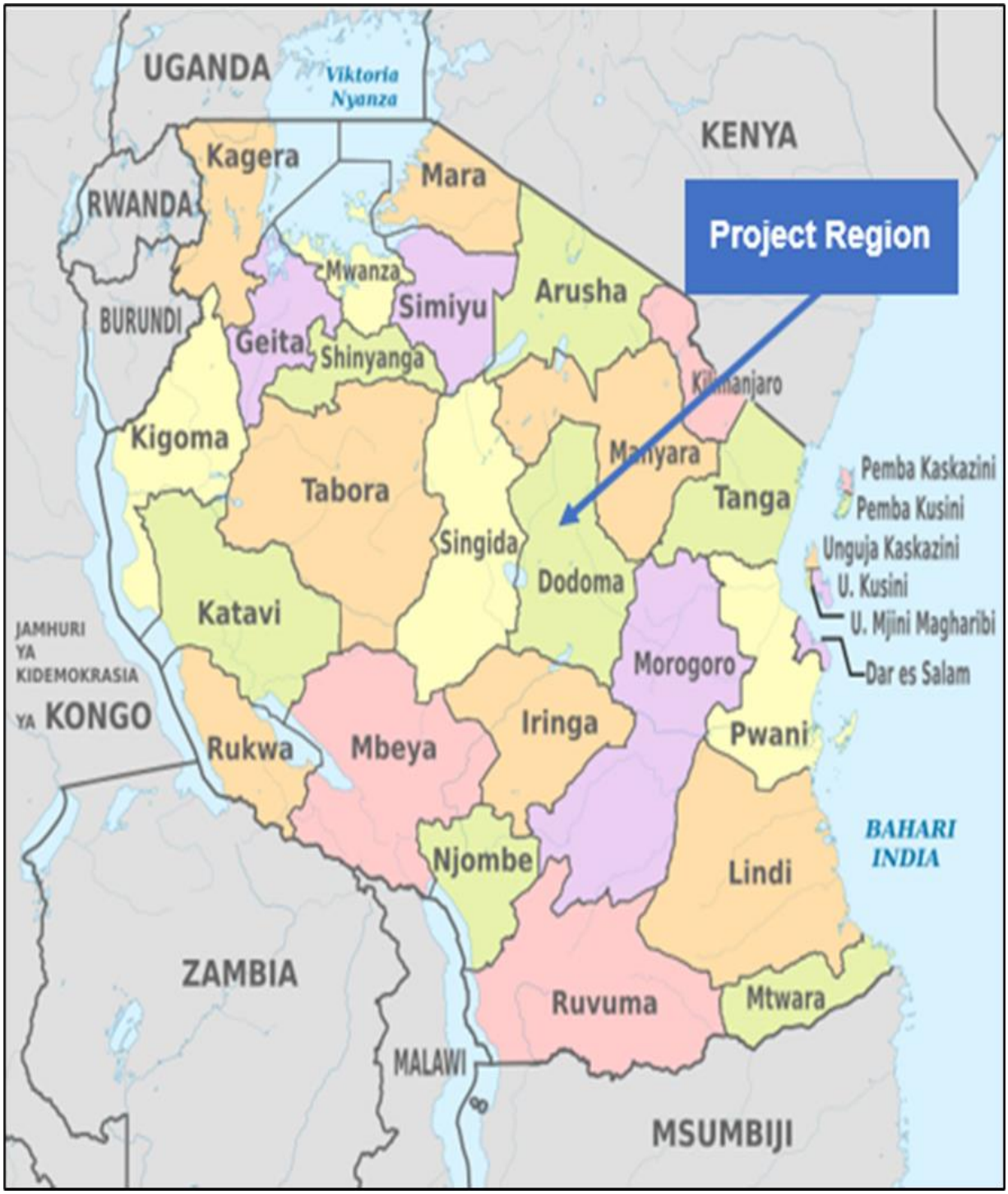

Figure 2.1: Location of Dodoma Region

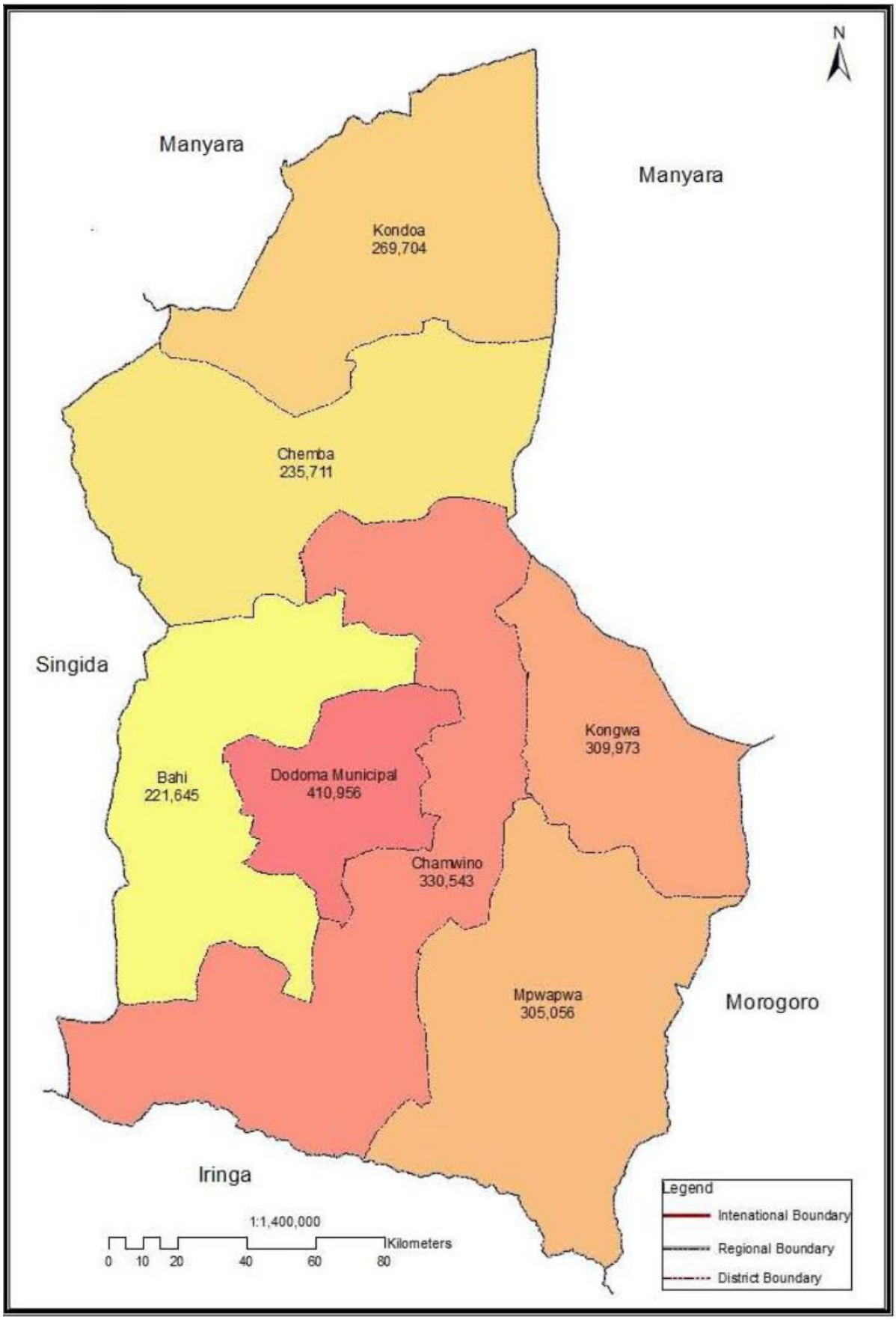

Figure 2.2: Location of Dodoma Districts

2.2 Project Objective and Justification

The objective of the project is to promote and facilitate traffic movement within and around the Dodoma City by upgrading the selected road sections into bitumen standard. As already mentioned, the justification for the project is prompted by the need to reduce traffic congestion in the city, considering that Dodoma is now the Capital City of Tanzania.

2.3 Description of the Road Sections

2.3.1 Bahi Roundabout – Msalato Airport Junction (10.17)

The Arusha Approach Road for the Repackaging is 10.7 km in length. From the field observation/ investigation, the Road project consists of 2 numbers of Concrete Pipe culverts (diameter 900 mm), 1 number of Concrete Pipe culverts (diameter 1200 mm), 6 number of Circular Metal Pipe and 2 numbers of Box Culvert. The approach road newly constructed dual carriageway is to have a total of 26 drainage structures proposed i.e. 13 structures for each carriageway.

The road is characterized with a moderately flat terrain and a carriage way width of 6.5m. Most of the road section is comprised with mitre and side drains along the road sides. The major structures along the Road are located at Chainages 0+520, 1+300, 2+100 and 2+300.

However, the area across the road stretch at chainage 0+000 to 0+500 experiences water stagnation during rainy season due to the nature of the slope at chainage 0+000 and the raised road level in comparison to the corridor area level. The stagnant water causes inconveniences to the community hence a need to introduce a water collection strategy to flow away from te community settlements.

Another area experiencing overtopping is the Box culvert at km 2+100 where the main cause is debris accumulation by a very large percent. The water flowing from high levels i.e. 2+300 also flows towards the box culvert at km 2+100 without proper drains, hence the need to upgrade the drains throughout the road stretch. Condition Survey of the Major Structures along the Bahi Roundabout - Msalato Airport Junction (10.17 Km)

Section 2.3.1.2: Details of issues along the proposed CBD roads in Dodoma City.

a) Km 0+520

The existing structure is a skewed 2 cell Box culvert with (4x1) m and (2x1) m. The structure is to be replaced with a 2/ (4x2) m Box Culvert so as to be Hydrologically adequate.

b) Km 2+100

The existing structure is a 5 cell Box Culvert. The structural Integrity of the structure is questionable as there are reinforcement exposure at the mid walls due to fire/ chemical exposure caused by the community dwelling and doing business an area closer to the Box culvert location.

There are also reports of overtopping during rainy seasons hence the hydrological inadequacy of the structure.

Hence, the need to replace the structure with a 3/ (6x2) m Box Culvert.

c) Km 2+300

The existing structure is a 5-cell box culvert. There are reports of overtopping at this location where as after overtopping, the water is redirected off course towards the structure at km 2+100 through the road and the community shops located along the road traversing the section.

The structure is to be replaced with a 4/ (6x2) m Box culvert to suffice the hydrological inadequacy.

2.3.2 CBD Roads (5Km)

The road is characterized with a moderately flat terrain. Most of the road section has covered drains and pipes at the median and sides. The major structures are located at Chainages 0+333, 1+500 and 2+300. The drainage system of this road section requires modifications in terms of size and placement location.

2.3.3 Image Roundabout – Mkonze (7.0 Km)

The Iringa Approach Road for the Repackaging is 7.0km in length. From the field observation/ investigation the road section contains 16 numbers of Concrete Pipe culverts (diameter 900 mm) and 15bnumbers of Box Culvert. Most of the surveyed drainage structures along the Approach road under study are in good condition. For the Dodoma – Iringa approach road newly constructed dual carriageway, a total of 66 drainage structures are proposed i.e. 33 structures for each dual carriageway. The **Error! Reference source not**

found. shows a summary of the drainage structure details for the Arusha Approach Project Road.

Table 2.1: Summary of Structures for Iringa Approach Road.

Type of Structure	Retained	Replaced	Total
CPCs (900mm)	15	4	19
CBCs	4	12	16

2.4 Description of Dodoma City

Dodoma City is the national capital of Tanzania. It was first founded by Germans in 1907 during the construction of Tanzania's central railway. The city was announced to be the capital of Tanzania in 1974 were among other reasons social and economic reasons leads to the transfer of the capital. It officially became the capital of Tanzania in 1996. In 2017, the Government of Tanzania has declared to completely shift the capital function to Dodoma City since 2020 the goal which is carved at 100%.

The Dodoma city is located at 6°10′23″ South 35°44′31″ East Coordinates in the center of the country, the town is 453 kilometers west of the former capital at Dar es Salaam and 441 kilometers south of Arusha, the headquarters of the East African Community.
Dodoma City Council features a semi-arid climate with relatively warm temperatures throughout the year. While average highs are somewhat consistent throughout the year, average lows dip to 13ºC in July. Dodoma City receives an average of 570 mm of precipitation per year, the bulk of which occurs during its wet season between November and April. The remainder of the year comprises the city's dry season.

Dodoma is currently, facing a critical challenge of congestion due to a number of reasons include the movement of almost all government offices from Dar es Salaam to Dodoma. Therefore, the project aims to decongest the Dodoma Capital City through Dodoma Integrated Sustainable Transport (DIST) Project. As part of DIST project implementation, TANROADS among others, has prepared the ESF documents which includes; Environmental and Social Framework (ESMF), Stakeholders Engagement Plan, Labour Management Plan, Resettlement Plan Framework as well as Environmental and Social Commitment Plan as a guiding tool for Environmental and Social Management compliance during project implementation. The Dodoma- Chamwino road section 32.1km will be funded by WB under the DIST project and these road section traverses through Mtumba, Ihumwa, Nzuguni, Ipagala and Makole wards, however, this road section will be implemented within Dodoma City which has no natural features such as (rivers, wetlands, forest areas).
Additionally, the decongestion of Dodoma City resulting from the relocation of Government offices may influence livelihoods through improved mobility, reduced travel time, and enhanced access to services and economic opportunities; these aspects are briefly assessed in the social impact section.

Table 2.2: The impacts mapping from route survey of CBD roads, Arusha and Iringa Approaches roads.

Chainage	Key Features (Socio-economic, environmental aspects along the proposed road)	Picture/Illustration
Km 0+520	• The following are physical aspects found along the road; • Pipe culvert and guardrail along the road. • The picture of culvert across Sagara river crossing the road project as it was observed during the study • The culvert seems to be silted with muds and sand, hence sometime water overpass on top of the road. • The culvert capacity failed to accommodate the water during rainy seasons.	
Km 5 + 100	• Traffic queue towards Dodoma City Centre. Grasses and Herbaceous plants along the road on both sides. • Grasses along the road on both sides. • Narrow road of single line which poses the risks to road traffic. • Pedestrian walkways and cyclic along the road. • Pedestrian walkways and cyclic along the road.	
Km 2 + 380	• CBE Jct – Ndasha – Bahi Roundabout Road • Experiences water stagnation during rainy season due to the nature of the slope at chainage 0+000 and the raised road level in comparison to the corridor area level. • Petty traders alongside the project road. • Narrow road of single line which poses the risks to road traffic. • Business premises along the road towards Iringa.	
Km 3+000	• Image Roundabout – SGR Station – Mkonze Village • Traffic queue towards to Dodoma City Centre and SGR station	

Chainage	Key Features (Socio-economic, environmental aspects along the proposed road)	Picture/Illustration
	• Grasses and herbaceous plants along the road on both sides. • Pedestrian walkways and cyclist along the road. • Section with single carriageway to accommodate the traffic volume during peak hours to SGR and Dodoma town. • Temporary car parking in RoW and other petty traders' activities.	
Km 2 + 400	• Central Roundabout – Jamatini Roundabout- Ndasha Airport/ Arusha Roundabout • The following are several physical aspects found along the road junction; • Trees along the road on both sides. • Pedestrian walkways and cyclist along the road.	
Km 2+192.782	• The following are several physical aspects found along the road; • Grasses and herbaceous plants along the road on both sides. • Pedestrian walkways and cyclist along the road.	
Km 2+900	• The following are several physical aspects found along the road; • Traders conducting business in Machinga Complex in Dodoma	
Km 1+200	• The road section marked with the following aspects; • Electrical poles along the road with high-voltage lines ranging from 66kV. • Market and junction and major community centre along the road. • Buildings and business premises along the road. • Temporary lorries parking within the RoW	

Chainage	Key Features (Socio-economic, environmental aspects along the proposed road)	Picture/Illustration
Km 2+400	• Partly Fence of Dodoma Airport adjacent to the RoW • Business kiosks and Residential houses along the roads on both sides • Lines of Grasses and Herbaceous plantson both side of the road reserve which used as shading along the road. • Electrical poles along the road with high-voltage lines ranging from 66kV. • Traffic lights at Chako ni Chako road Junction	
Km 8	• Part of the parliamentary buildings along the road. • Narrow road with Single line which poses the risks of traffic accident along the road section. • Pedestrian walkways and cyclic along the road • Lines of planted grasses and herbaceous plants along the road. • VETA college along the road. • Electrical poles along the road with high-voltage lines ranging from 66kV. • Open space and temporary bus and lorries parking spaces • Shabiby roundabout • The road section marked with several road junctions which are prone to road accidents such as Bunge junction, shabiby roundabout.	

2.5 Project Phases, Activities and Facilities

2.5.1 Mobilization phase

Construction laborer's

About 1000 workers, both skilled and unskilled, will be recruited during the project duration, in accordance with project phasing requirements. The mobilization phase will require the labor force of approximately 100 workers, the majority (80%) of whom will be daily local casual workers and 20% will be professionals. The construction workers will not be residing at the contractor's campsite but will be be residing from their homes in the surrounding villages/streets along the road. These workers will be managed through the project Labour Management Procedures (LMP) for DIST to be adopted by Contractor as per **appendix 5.**

Contractor equipment's and facilities

The Contractor will mobilize equipment, machinery, and the installation of plants (asphalt and concrete) and construction of campsite facilities (permanent residential houses for the Supervising Engineer, offices, a laboratory, etc.), construction of temporary facilities for the Contractor (residential tents, offices, toiles, workshop, storage houses, oil storage tank, waste storage facilities, water storage tank/pond, security fence and gate), as well as the acquisition of permits required by law.

Diversion Roads/Detours

Diversion will be required to maintain a usable road during the construction period. Wherever practicable, alternative local roads will be used. The construction and maintenance of these diversion is expected to be of a standard that ensures the safety of the public, diversions outside the road reserve require additional permission of the land occupier. Impacts on private property during the establishment of diversions will be addressed as per the requirement of the project RPF. During demobilization phase the diversion will be executed by taking back the original topsoil and engineered to prevent soil erosion. Routes for the diversions will be selected within the construction corridor to follow the areas, which will have minimum impacts on the natural environments and yet have minimum cost implications. The Contractor shall develop and implement a dynamic ***Traffic Management Plan (TMP)*** to guide flow of traffic and smooth mobility during construction of the project road.

Contractor Campsites and Workshop

The main campsite will be constructed for the Contractor with an administrative headquarters for the Project. Another campsite (i.e., Engineers Compound) will be constructed for the Resident Engineer and his/her staff. Alternatively, both may be located at the same compound with shared facilities to minimize environmental footprint and maximizing resources efficiency. The Contractor's campsite among others, office space, materials laboratory batching and asphalt plant, machinery yard, workshop, fuel pump, first aid clinic, etc. The Engineer's compound will include Engineer's accommodation, laboratory, washhouse and office. Selection of the location of campsites will consider convenience for the Contractor to communicate with the Project Engineer and for Laboratory testing. As provided in the Environmental Code of Practice for Road Works (URT, 2009), campsites must be properly located to avoid or minimize environmental disturbance.

The Contractor shall observe the following conditions as a minimum:

i. The construction site's access paths, storage and parking facilities, Contractors campsites' site offices, and other temporary installations must be located at least 60m from permanent watercourses (including irrigation and drainage canals) or lakes and more than 30m from intermittent watercourses;
ii. Contractor campsite must be located at least 150m from the road reserve of a main road to reduce the harmful effects of noise and more than 500m from inhabited zones (including sensitive social receptors such as learning institutions, villages, hospitals etc.);
iii. Sites of exceptional interest (e.g. Livestock crossing areas, ecological or archaeological) must be avoided;
iv. The campsite must be located at least 10km from classified forests to avoid the illegal harvest of wood for domestic purposes;
v. The operation of the construction campsite must not lead to conflicts with the local population over the use of local resources for domestic purposes.

It is anticipated that the contractor will determine the location, size, capacity, and type of camp(s) during the pre-construction phase in consultation with TANROADS. Before establishing the camp, a detailed assessment of potential sites will be undertaken considering technical, environmental, socio-economic, and cultural factors. Land for campsites may be acquired through a willing buyer–willing seller arrangement, use of public land where available, or other lawful acquisition modalities consistent with national laws and the World Bank ESF. The selection and approval of the preferred site will involve the Contractor, TANROADS, Regional Secretariat (Dodoma), NEMC-Southern Highlands Zone, DEMO, and local authorities.

Power supply around the campsite.

As part of ESS-3 on energy efficiency, the contractor campsite will install the standby generator of 500kv to support on power backup instead of shortage of power from national grid. The campsite will be located along the areas which is accessible in term of electric power and other services to the Contractor and Supervising consultant. As part of energy efficiency, the Contractor will switch off all the machines and equipment's when not in use or during break hours as part of energy serving. Apply the administrative and engineering methods to budget for fuel consumption during project executions. Will also ensure that the Campsites is connected with National Grid as main supply of electricity for equipment and machinery.

Compensation of affected properties and relocation of affected utilities along the road.

The road widening will affect some properties along the road including houses, kiosks, trees which belong to PAPs, the project will also affect the utilities such as electrical poles, water pipes, and communication cables along the road that need to be relocated out of 60m prior project executions.

2.5.2 Construction Phase Activities and Facilities

The construction works is expected to take about 36 months and the construction will start after relocation of utilities such as power lines, water pipes, or telecommunication lines along the road as well as relocation of all affected properties after compensation which shall be implemented according to the DIST project (RPF and RAP). Other related activities at this phase will include:

- Earth movements, excavations and stockpiling of excavated materials;
- Operation of borrow pits, quarry sites and cement/asphalt batch plant;
- Stockpiling of construction materials such as sand, stone aggregates, cement, bitumen, etc.;
- Installation of culverts structures;
- Creation of road side drains and storm water drainages and access roads; and
- Transportation of construction materials such as sand, cement, stone aggregate and soils.

The main activities under this phase will includes

i. Pavement construction with crushed stone base

Implementing this option would involve the following activities:

a. Removal of spoil existing bituminous surfacing;
b. Scarifying existing cement stabilized base course and stockpile on site for re-use;
c. Scarifying existing gravel sub-base material and stockpile on site for re-use. Where existing subgrade has 3% < CBR < 7%, scarify and stockpile for re-use to a depth below the new lower subgrade layer. Scarify 150mm deep, mix and compact to 90% BS-Heavy Compaction density to form roadbed. Construct 150mm thick lower subgrade layer using excavated or imported gravel material with CBR > 7% compacted to 93% BS-Heavy Compaction density. Construct 150mm thick upper subgrade layer using imported gravel material with CBR > 15% compacted to 95% BS-Heavy Compaction density;
d. Where existing subgrade has 7% < CBR < 15%, scarify and stockpile on site for re-use to a depth below new upper subgrade layer. Scarify 150mm deep, mix and compact to 93% BS-Heavy Compaction density to form lower subgrade layer. Construct 150mm thick upper subgrade layer using imported gravel material with CBR > 15% compacted to 95% BS-Heavy Compaction density;
e. Where existing subgrade has CBR < 3%, remove to spoil to 150mm depth below bottom of lower subgrade layer. Scarify 150mm deep, mix and compact to 100% BS-Light Compaction density to form roadbed. Construct 150mm thick fill using excavated or imported gravel material with CBR > 3% compacted to 90% BS-Heavy Compaction density. Construct 150mm thick lower subgrade layer using excavated or imported gravel material with CBR>7% compacted to 93% BS-Heavy Compaction density. Construct 150mm thick upper subgrade layer using imported gravel material with CBR>15% compacted to 95% BS- Heavy Compaction density;

f. Relay excavated base material. Add natural gravel with CBR >25% to make up levels where required. Add cement, mix and compact to 97% BS Heavy Compaction density to form 200mm thick cement stabilized subbase layer with UCS minimum 1.0MPa;
g. Construct 150mm thick base course using crushed stone material from fresh rock compacted to 88% of aggregate density; and;
h. Surface with double bituminous surface dressing using 70/100 penetration grade bitumen and 20/10mm aggregates.

It has been concluded that the rehabilitation of the road shall involve full reconstruction of the existing pavement and construction of a new pavement on widened sections. Full reconstruction of the existing pavement shall involve replacing the existing subgrade and subbase materials with imported good quality materials to form the subgrade layer and the existing base course reprocessed and improved to form part of the subbase layer for the new pavement.

Since the whole pavement structure will be reprocessed, it will lose whatever residual life it may have. It will therefore be pointless to incorporate into the design any pavement residual life. Consequently, the pavement design shall be carried out as for a new road and shall not be based on uniform sections determined from deflections during pavement investigations.

ii. Pavements for Widened Sections

Base course, subbase course and selected subgrade layers for widened sections of the road shall be constructed to thicknesses and quality of materials specified for reconstruction of the road pavement.

iii. Construction Details of In-Situ Materials on Widened Sections

Construction details and treatments for in-situ materials and pavement layers after clearing and grubbing are recommended in for different sections along the road depending on the strength properties of in situ materials. The proposed treatments extend over both the carriageway and the road shoulders.

iv. Construction of Bus Bays

Pavements for bus bays shall be constructed simultaneously with the adjoining road pavement in order to ensure proper bonding. Construction of the bus bays pavements after the road pavement has been constructed is discouraged because the two pavements do not bond properly and often leads to premature failure at the joint.

v. Improvement of Junctions

This work shall include the widening of the access roads junctions. At several junction culverts have been constructed across the access road but are silted as a result of which the main road side-drain is blocked. At these junctions, cleaning of existing culverts shall be carried out and at least 2m lengths of drains adjacent to the culverts will be lined to ease de-silting operations. Access roads at major junctions shall be constructed to bitumen standards and extend to the road reserve boundary as recommended in the terms of reference. This work is intended to protect the edge of the sealed shoulder from edge.

vi. Kerbing

This work shall involve construction of precast kerbing along curves at major junctions and at intersections with access roads to protect pavement edges. In order to discourage but not completely prevent access to the main road and in order to protect edges at some locations, semi-mountable kerbs conforming to the requirements of the PMDM shall be adopted.

vii. Climbing Lanes

Where the critical lengths of gradients cannot be achieved along the highway, consideration has been given to application of climbing lanes which an auxiliary lane is provided to remove the slow-moving trucks from the traffic stream climbing a gradient in order to improve safety and the level of transportation service. The width of the climbing lanes is the same as the width of the adjacent lane.

viii. Shoulders Pavement

The shoulder pavement design shall take into consideration the likely maximum load on the structure and the possible requirement for edge support at embankment slope. Measures to prevent or delay cracking between carriageway and shoulder shall be considered. Although the traffic loading on the shoulder will likely be less than that on the carriageway, it is recommended to construct a similar pavement for carriageway and shoulders in view of the following factors:

a. It is difficult to achieve proper bonding of pavements if they are of different materials and this will result in water infiltrating at the joint and cause deterioration of the pavements;
b. The soils in the project area are predominantly silty sands which are prone to erosion and infiltration of moisture and consequently, the road pavement will need adequate and proper protection; and
c. This is an international road consequently it should be constructed to regional standards.

ix. Surfacing of Shoulders

In accordance with the Road Geometric Design Manual6, shoulders of paved roads shall also be paved such that the surface of the shoulder shall be level with that of the adjacent traffic lane. Consequently, shoulders surfacing shall be similar to that adopted for the carriageway for the various sections as follows:

a. The soils in the project area are predominantly silty sands which are prone to erosion and infiltration of moisture. Consequently, the road pavement needs adequate and proper protection; and
b. Shoulders for the rest of the main road shall be surfaced with double bituminous surface treatment using 20mm and 10mm aggregates as for the carriageway.

The road shoulders are to be paved with the same material as the carriageway and has to be level with that of the adjacent traffic lane.

2.5.3 Demobilization Phase Activities and Facilities

The demobilization period is expected to be about 3 months. The major activities during demobilization period include:

a. At this stage the number of workers is expected to be reduced to about 150 (skilled and unskilled) for demobilization phases activities;
b. There will not be any temporally campsite that will be handed over to local governments, instead the permanent structures which were used by Supervising engineer may be handed over to the LGAs for schools or health facilities which fit-for-purpose structural integrity;
c. Dismantle ring of machinery and plants and non-mobile campsite and their removal;
d. Demobilization of temporally workers' camps will most likely happen every time the camp moves to a new location;
e. Other activities include rehabilitation of the workshop and stockpile yard, rehabilitation of affected areas within the campsite;
f. Rehabilitation of borrow pits and quarry site at least to the reasonable conditions that influence ecological function;
g. Stockpiled materials be removed from the road site and used for rehabilitating borrow pits;
h. Undertake landscaping in all degraded areas at the campsite and along the road as part of beatification;
i. Ensure removal of all sorts of wastes including used oil, sewage, solid wastes (plastics, use tiles, bitumen drums, used batteries, wood, metal scrapers, papers, etc.) by authorized waste dealers to disposal site;
j. Continue with demobilization of temporary employment to the reasonable required number; and
k. The permanent workers' camp will be handed over to the community after construction work, on request, and/or decommissioned & restored as appropriate.

The most important waste to be generated includes pieces of bricks, concrete rubbles, pieces of wood, scrap metals. All these wastes will be disposed of into the approved dump site. However, the re-usable materials can be handed over to the local people.

2.5.4 Operation and Maintenance Phase

The proposed road is an urban strategic road that is expected to carry international traffic. Its construction is thus expected to be up to acceptable regional and international standards. Consequently, the pavement shall be designed for construction by equipment-based methods as equipment, materials and technology are available at competitive prices.

The pavement design will be such that major interventions such as resealing and strengthening of base course shall be required after a relatively longer period of say more than 10 years in order to avoid frequent interruptions to traffic.

The current maintenance regime for the road has proven effective in carrying out routine and periodic maintenance works on the existing road. The pavement design will consider that this practice will be sustained after the road is upgraded so that routine maintenance on the new road will be implemented regularly.

2.6 Project Requirements

a. Labour Force

The project is expected to employ both semi-skilled and skilled personnel. The number of people to be employed will depend on the construction requirements. However, it is expected that most of the semi-skilled personnel will be from within the project area. The intention is to promote employment for the local residents and discourage the number of newcomers, to minimize their interaction with local residents and therefore control prevalence of HIV/AIDS and Sexually Transmitted Infections (STIs) during construction.

b. Equipment and Machinery

The equipment to be used during road rehabilitation can be summarized as on Table 2-3:

Table 2.3: Types of Equipment and Machinery to Be Used During Construction

No	Machinery/Equipment	Activity for which it is required
Construction Equipment: Type and Characteristics		
1.	Backhoe excavator	General earth works, e.g. excavation of drains and river dredging
2.	Bull dozer with ripper	General earth works
3.	Wheeled loader	General earth works and transport of concrete
4.	Motor grader	General grading works, including earth works
5.	Vibrating/sheep foot roller compactor	Compaction works
6.	Vibrating steel drum roller compactor	Compaction works
7.	Tandem roller compactor: 8 – 10 ton	Compaction works
8.	Pneumatic Tired Roller (PTR) compactor	Compaction works
9.	Hydraulic hammer	Piling works
10	Truck mounted crane	Lifting of construction materials e.g. pre-cast culverts
Construction Machines		
1.	Concrete batching plant	Preparation of concrete (batch concrete mixing)
2.	Concrete truck mixer (mobile concrete mixer)	Concrete mixing
3.	Concrete mixer	Concrete mixing
4.	Small site dumper	Transport of construction and waste materials
5.	Bitumen distributor	Distribution of bitumen
6.	Mechanical broom	Cleaning of runways surface
8.	Stone crushing plant	Production of chipping (aggregates) from hard stones)
9	Screening plant	Sorting of different sizes of aggregates
10	Quarry dump trucks	Transport of stones and aggregates
11	Dump trucks	Transport of construction materials and wastes
12	Power bloom and blower	Blowing of surfaces before paving
13	Asphalt plant	Manufacture of asphalt
14	Finisher for asphalt concrete pavement	Surface paving
15	Concrete batch plant	

No	Machinery/Equipment	Activity for which it is required
16	Equipment for geotechnical investigations	Geotechnical investigation works
17	Concrete vibrator and poker	Vibrating concrete
18	Dewatering pump	Dewatering to allow for waterless construction
19	Air compressor and wagon drill	To create pressurized air during drilling and cleaning during road surfacing etc.
20	All essential supporting units such as generators, mobile workshop, tyre repair shops, welding facilities, services trucks, low-bed trailer (low-loader) units etc.	Repair and maintenance of machinery and equipment
Transport Facilities		
1.	Light duty vehicles	Transport of light construction materials, stationery machines, and staff
2.	Water and fuel tankers tanker truck	Dewatering of earth surfaces to attain effective compaction, minimizing generation of dust, and transport of fuel
3.	Dumps trucks	Transport of construction materials (sand, gravel, aggregated, cement etc.)

(Source: Design Team, 2025)

c. Asphalt Batch Mix Plant

The proposed project will involve setting up and operating an Asphalt mixing plant with its support facilities and it will basically consist of:

a. 4 Feeder bins-for holding the aggregate/filler mixture (crushed rock and sand as filler). The bins shall be proportioned by cold feed gates;
b. Dryer for drying and heating the aggregate/filler mixture;
c. Dust collectors for removing undesirable amounts of dust from the dryer exhaust;
d. Plant exhaust stack that eliminates exhaust gases;
e. Hot elevator that delivers the dried and heated aggregate/filler mixture the hot bins;
f. Hot bins for deposition of the heated aggregates;
g. Hot binder tank where hot binding material (bitumen) is heated and stored;

2.7 Construction materials

The main construction materials for the road include sand, gravel, hard stones (aggregates), reinforcement iron bars, water, and bitumen. Most of the materials shall be obtained locally (within Tanzania) except bitumen which shall be imported. Material investigations have been made to identify sources for suitable construction materials including borrow pits, sandpits, construction water sources, and quarry sites.

i. Oils and fuels for machines operations

The source of oils and fuels for operation of mobile equipment / machinery are readily available from various petrol stations. The amount of oils and fuels to be used will depend on

the operational requirements. Fuel dispensing areas shall be paved and proper drainage provided to safely contain the spills and runoff, through use of oil interceptor.

Bitumen

Bitumen for road works is generally readily available from BP, Oryx, TPDC or other suppliers. Bitumen properties will be checked by testing representative samples in approved laboratories. The MC 30 curing cutback and 40/50 or 60/70 pen – grade will be used for Asphalt Concreter (AC).

ii. Cement

Cement for construction is easily available in the mainland, parked in 50kg bags, and sourced from the factory in Dar-Es-Salaam and Tanga.

iii. Reinforcement Steel

Reinforcement steel for structural works is also available in the mainland from various factories in Dar-Es-Salaam, Tanga, and or Abroad. Strength and other properties of reinforcing steel to be confirmed by testing of samples in approved testing laboratories.

2.7.1 Borrow Pits Areas

A total of fourteen (14) potential borrow areas were identified during the soil and materials investigation along and near the project road corridor. Four (4) of these borrow pits are proposed for use under this project, including both existing and newly identified sites. Since the newly identified borrow pits will form part of the project's auxiliary facilities, their development, operation, and rehabilitation will follow a structured selection and approval protocol to ensure environmental and social compliance.

Selection of borrow pit areas will be undertaken through a participatory process involving TANROADS, local government authorities, community leaders, and affected landowners. Prior to any site entry for investigation or opening, TANROADS together with the Contractor will conduct community consultations to obtain consensus on access, evaluation of materials, and potential land-take requirements. Negotiations on compensation will be carried out transparently and in accordance with the provisions of the RAP and relevant national and World Bank ESF requirements. Where in-kind compensation is proposed (e.g., minor civil works), such measures will undergo a separate E&S review to ensure that no additional adverse impacts arise.

The Contractor will prepare a comprehensive Borrow Pits Management Plan (BPMP) during the mobilization phase, to be reviewed and approved by the Resident Engineer before any borrow pit is opened. The BPMP will outline procedures for site selection, community engagement, access, compensation, environmental protection, safety measures, and rehabilitation. Table 2.4 below gives a summary of the locations of the potential borrows areas and their estimated quantities.

Table 2.4: Existing and New Borrow Areas and Estimated Quantities

No.	Borrow pit Name	Longitude	Latitude	Location (km)	Offset distance	Estimated Depth of Materials (m)	Estimated Area (m2)	Quantity to be excavated (m3)
BP01	CHINANGALI ii- Existing area	36.072430°	06.178300°	122+180	0.2km LHS	2.5	85,171	212,928
BP12	MBANDE-New	36.405276°	06.164507°	193+180	0.5km LHS	2.0	134,700	269,400
BP13	WILUNZE(MANCHALI) Existing area	36.252290°	06.125960°	201+180	200m LHS	2.0	110,541	221,082
BP14	IHUMWA-New	35.895230°	06.073470°	248+650	9.0km RHS	2.5	904,081	2,260,203
	TOTAL							6,536,455

Source: Consultant estimates 2025

2.7.2 Water Sources

The water sources were also identified and investigated in order to establish their suitability for construction works in accordance with the relevant standards. The water samples were sampled from the perennial rivers along the project roads table 2.5 gives the location of water sources suitable for construction.

The chemical tests for the water samples collected were performed at Water Institute to ascertain the quality of these proposed sources. The tests were done according to BS EN 206-1:2000 and DIN 4030-2.

Table 2.5: Sources of water

Water source	Location	Offset distance (km)
Mbande Nyama	Kongwa border	0
River Kinyasungwe	Chalinze Nyama	1.5 LHS
Changarawe Dam	Kongwa/Kiteto junction	10.5 LHS

2.8 Summary of Management of Waste to be generated

The public consultation result, design and baseline data indicates that, potential wastes to be generated includes; solid wastes, gaseous wastes and liquid wastes, which among others may be hazardous wastes that may include (scrapers, plastic bottles, bitumen, used betteries, used oils and greases) along the road and around major centers. If these wastes will not be managed may result potential risks associated with waste generation on soil, air, surface and groundwater bodies which finally affect health and safety impacts for both workers and local communities. As part of management of wastes to every responsible districts and small towns, the study revered that, along the road, there are several wastes authorised dealers who collect scrapers, used plastic bottles, used oils along the major centers and township for disposal. However, as per project design report as well as ESIA survey report indicated that the hazardous wastes may originate from materials such as equipment containing PCBs (e.g., transformers, capacitors, waste containing asbestos (e.g., asphalt, bridge structures, etc.) are not anticipated along the road due to the nature of the road construction works, materials and equipment's not using such related materials.

Hazardous wastes will be generated from (spillage oils, scrapers, greases, batteries, used filters, bitumen); other hazardous wastes will be from CFC gases from AC, refrigerator and other sources at workshop, E-wastes from transmitters, television and A/C (dusts, HC, Nox, CO), hydrogen). However other waste will include solid and liquid wastes, medical related wastes; gaseous wastes that will be generated from construction activities in road corridor, contractor's campsite, quarry site and borrow pits areas and therefore shall be handled as per national laws and WBG EHS guidelines for extraction of construction materials. (whether be degradable, buried, recycled) as specified in the project ESMP and Waste Management Plan (WMP) shall be adopted by the Contractor. Note: More information on Environmental

Management (Hazardous Waste Control and Management) can be accessed through:https://www.nemc.or.tz/uploads/publications/sw-1576229713-HAZARDOUS%20WASTE%20REGULATIONS.pdf as well as the WBG EHS Guidelines through https://www.ifc.org/content/dam/ifc/doc/2000/2007-general-ehs-guidelines-en.pdf

3.0 POLICY, LEGAL AND INSTITUTIONAL FRAMEWORK

3.1 Overview

This section is aimed at reviewing relevant environmental resources and planning legislation and regulations to ensure that the proposed road sections under DIST meet policy and legislative criteria, and that relevant requirements are built into project design and implementation. The section also provides strategies, standards, international conventions, and treaties that are relevant to the environmental management of the project. The policy review also outlines specific procedures and measures to be carried out before, during, and after project development.

3.2 World Bank's Environmental and Social Framework

The World Bank Environmental and Social Framework sets out the World Bank's commitment to sustainable development, through a Bank Policy and a set of Environmental and Social Standards that are designed to support Borrowers' projects, to end extreme poverty, and promote shared prosperity.

This Framework comprises:

- A Vision for Sustainable Development, which sets out the Bank's aspirations regarding environmental and social sustainability;
- The World Bank Environmental and Social Policy for Investment Project Financing, which sets out the mandatory requirements that apply to the Bank; and
- The Environmental and Social Standards, together with their Annexes, set out the mandatory requirements that apply to the Borrower and projects.

This ESIA has reviewed the above framework's components' relevance to the Project as shown in the below subsections;

3.2.1 Vision for Sustainable Development

World Bank Group is globally committed to environmental sustainability, including stronger collective action to support climate change mitigation and adaptation, recognizing this as essential in a world of finite natural resources. It recognizes that climate change is affecting the nature and location of projects and that World Bank-financed projects should reduce their impact on the climate by choosing alternatives with lower carbon emissions.

Equally, social development and inclusion are critical for all of the World Bank's development interventions and for achieving sustainable development.

At the project level, these global aspirations translate into enhancing development opportunities for all, particularly the poor and vulnerable, and promoting the sustainable management of natural and living resources. Therefore, within the parameters of a project, the Bank seeks to:

- Address project-level impacts on climate change and consider the impacts of climate change on the selection, siting, planning, design and implementation, and decommissioning of projects;

- Maximize stakeholder engagement through enhanced consultation, participation, and accountability.

3.2.2 World Bank Environmental and Social Policy for Investment Project Financing

This Environmental and Social Policy for Investment Project Financing sets out the mandatory requirements of the Bank about the projects it supports through Investment Project Financing. The Bank is committed to supporting Borrowers in the development and implementation of projects that are environmentally and socially sustainable, and to enhancing the capacity of Borrowers 'environmental and social frameworks to assess and manage the environmental and social risks and impacts of projects.

The Bank shall assist Borrowers in their application of the ESSs to projects supported through Investment Project Financing by this Environmental and Social Policy for Investment Project Financing (Policy).

To carry out this Policy, the Bank shall:

- Undertake its due diligence of proposed projects, proportionate to the nature and potential significance of the environmental and social risks and impacts related to the project;
- As and where required, support the Borrower to carry out early and continuing engagement and meaningful consultation with stakeholders, in particularly affected communities, and in providing project-based grievance mechanisms;

The Banks shall evaluate the environmental and social risks management plan including the extent of stakeholders' engagement on the project throughout.

3.3.3 The World Bank's ESSs, 2018 and the EHS Guidelines

The World Bank Environmental and Social Framework (ESF) sets out the World Bank's commitment to sustainable development. The ESF protects people and the environment from potential adverse impacts that could arise from Bank-financed projects and promotes sustainable development. Launched on October 1, 2018 and effectively replacing the Bank's Safeguards Policies; the ESF enables the World Bank and Borrowers to better manage environmental and social risks of projects and to improve development outcomes. The ESF also places more emphasis on building Borrower governments own capacity to deal with environmental and social issues.

The ESF is made of Environmental and Social Standards (ESSs 1-10), together with their annexes, set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the Bank through Investment Project Financing. The Bank believes that the application of these standards, by focusing on the identification and management of environmental and social risks, shall support Borrowers in their goal to reduce poverty and increase prosperity in a sustainable manner for the benefit of the environment and their citizens.

The standards:

- Set out requirements for Government of Tanzania to the identification and assessment of E&S risks and impacts associated with the proposed road project while applying the mitigation hierarchy, which is also provided for in Environment Management Act, 2004;
- Support GoT in achieving good international practice relating to environmental and social sustainability;
- Assist GoT in fulfilling their national and international environmental and social obligations, with stronger emphasis on integrated environmental and social assessment and risk management;
- Increase responsiveness and attention to project issues during implementation through adaptive risk management and proportionality;
- Enhance non-discrimination, transparency, participation, accountability and governance, and this shall help highlight- areas that need further strengthening in Tanzania's own systems;
- Adopt differentiated measures so that adverse impacts do not fall disproportionately on the disadvantaged or vulnerable, and they are not disadvantaged in sharing development benefits and opportunities;
- Utilize national environmental and social institutions, systems, laws, regulations and procedures where appropriate;
- Promote improved environmental and social performance, in ways which recognize and enhance Borrower capacity; and
- Enhance the sustainable development outcomes of projects through structured and inclusive stakeholder engagement.

3.3.3.1 World Bank Environmental and Social Standards (ESS)

The Environmental and Social Standards (ESS) set out the requirements for Borrowers relating to the identification and assessment of environmental and social risks and impacts associated with projects supported by the Bank through Investment Project Financing. The Bank believes that the application of these standards, by focusing on the identification and management of environmental and social risks, shall support Borrowers in their goal to reduce poverty and sustainably increase prosperity for the benefit of the environment and their citizens. The standards aim at the following:

(a) Support Borrowers in achieving good international practice relating to environmental and social sustainability.
(b) Assist Borrowers in fulfilling their national and international environmental and social obligations.
(c) Enhance non-discrimination, transparency, participation, accountability, and governance.
(d) Enhance the sustainable development outcomes of projects through ongoing stakeholder engagement.

The Bank requires that the Borrower and the project apply the ESS through the project life cycle to manage environmental and social risks and impacts so that development opportunities are enhanced. The following are the **Applicable** ESSs as the road project is concerned.

i. Assessment and Management of Environmental and Social Risks and Impacts (ESS1) – Applicable.

ESS-1 sets out the Borrower's responsibilities for assessing, managing and monitoring environmental and social risks and impacts associated with each stage of a project supported by the Bank through Investment Project Financing, in order to achieve environmental and social out-comes consistent with the Environmental and Social Standards (ESSs).

Borrowers shall conduct environmental and social assessment of projects proposed for Bank financing to help ensure that projects are environmentally and socially sound and sustainable. The environmental and social assessment shall be proportionate to the risks and impacts of the project. It shall inform the design of the project, and be used to identify mitigation measures and actions and to improve decision making.

Borrowers shall manage environmental and social risks and impacts of the project throughout the project life cycle in a systematic manner, proportionate to the nature and scale of the project and the potential risks and impacts.

ESS-1 includes three annexes (1) Environmental and Social Assessment; (2) Environmental and Social Commitment Plan; and (3) Management of Contractors which form part of ESS-1and sets out certain requirements in more detail.

ii. Labor and Working Conditions (ESS-2) – Applicable.

ESS-2 recognizes the importance of employment creation and income generation in the pursuit of poverty reduction and inclusive economic growth. Borrowers can promote sound worker-management relationships and enhance the development benefits of a project by treating workers in the project fairly and providing safe and healthy working conditions. Among ESS-2 objectives include:

- To promote safety and health at work;
- To promote the fair treatment, nondiscrimination and equal opportunity of project workers;
- To protect project workers, including vulnerable workers such as women, persons with disabilities, children (of working age, in accordance with this ESS) and migrant workers, contracted workers, community workers and primary supply workers, as appropriate;
- Provide project workers with accessible means to raise ***workplace concerns;***
- To prevent the use of all forms of forced labor; and
- Support the principles of ***freedom of association*** and ***collective bargaining*** of project workers in a manner consistent with national law.

Project workers for the proposed rehabilitation of Dodoma -Morogoro road shall be provided with information and documentation that is clear and understandable regarding their terms and conditions of employment. The information and documentation shall set out their rights under national labor and employment law (which shall include any applicable collective

agreements), including their rights related to hours of work, wages, overtime, compensation and benefits, as well as those arising from the requirements of this ESS 2.

This project shall not engage any Primary Suppliers as laborer's sources for migrant workers or community workers as per the ESF definition, however, all contracted workers about (1000) shall be contracted as per requirement specified in the project LMP. This information and documentation shall be provided at the beginning of the working relationship and when any material changes to the terms or conditions of employment occur.

Labour Management Procedures (LMP) have been prepared for DIST to ensure the requirements of ESS2 and national laws are observed and included in the specifications for contractors. In addition to the labor management procedures, the TANROADS and/or contractor/s should prepare and implement an Occupational Health and Safety Plan addressing among others the following: hazards in the workplace, organization and staffing, protective measures for hazardous conditions, worker training, accident/incidents reporting procedures, emergency response procedures, etc. The project contractors shall adhere to the requirements under regular audits to be conducted by TANROADS, Supervising Engineer, and other government agencies like the Occupational Safety and Health Authority (OSHA) to ensure that the project workers are treated fairly and provided with safe and healthy working conditions.

iii. Resource Efficiency and Pollution Prevention and Management (ESS-3) – Applicable.

ESS3 recognizes that economic activity and urbanization often generate pollution to air, water, and land, and consume finite resources that may threaten people, eco-system services and the environment at the local, regional, and global levels. The current and projected atmospheric concentration of greenhouse gases (GHG) threatens the welfare of current and future generations. At the same time, more efficient and effective resource use, pollution prevention and GHG emission avoidance, and mitigation technologies and practices have become more accessible and achievable.

As part of ESS-3 on energy efficiency, the contractor campsite shall install the standby generator of 500kv to support on power backup instead of shortage of power from national grid. The campsite shall be located along the areas which is accessible in term of electric power and other services to the Contractor and Supervising consultant. As part of energy efficiency, the Contractor shall switch off all the machines and equipment's when not in use or during break hours as part of energy serving. Apply the administrative and engineering methods to budget for fuel consumption during project executions. Shall also ensure that the Campsites is connected with National Grid as main supply of electricity for equipment and machinery.

Among ESS-3 objectives include:

- To promote the sustainable use of resources, including energy, water and raw materials;
- To avoid or minimize adverse impacts on human health and the environment by avoiding or minimizing pollution from project activities;
- To avoid or minimize project-related emissions of short and long-lived climate pollutants;
- To avoid or minimize generation of hazardous and non-hazardous waste; and
- To minimize and manage the risks and impacts associated with pesticide use.

On pollution prevention and management, the Borrower shall avoid the release of pollutants or, when avoidance is not feasible, minimize and control the concentration and mass flow of their release using the performance levels and measures specified in national law or the EHSGs, whichever is most stringent.

The proposed upgrading of Dodoma CBD roads shall significantly reduce emissions as a result of enhanced road conditions and improvements in vehicle fuel consumption efficiency. Among the efforts to reduce emissions are national policies which have stressed on importation of vehicles with not more than 10 years from manufacturing date. During construction, the contractor shall adhere to all recommended actions to reduce GHG emissions from operating vehicles, equipment and plants.

Furthermore, the construction activities shall generate dust, erosion, sediments, solid and liquid wastes that shall be properly managed via ESMPs and waste management plans (WMPs). More or less similar impacts are likely to be experienced during operation phases and shall be managed by the same tools as well as operation and maintenance plans.

iv. Community Health and Safety (ESS-4) – Applicable.

ESS4 recognizes that project activities, equipment, and infrastructure can increase community exposure to risks and impacts. In addition, communities that are already subjected to impacts from climate change may also experience an acceleration or intensification of impacts due to project activities.

ESS4 addresses the health, safety, and security risks and impacts on project-affected communities and the corresponding responsibility of Borrowers to avoid or minimize such risks and impacts, with particular attention to people who, because of their particular circumstances, may be vulnerable.

Objectives of the ESS4 include:

- To anticipate and avoid adverse impacts on the health and safety of project-affected communities during the project life cycle from both routine and non-routine circumstances;
- To promote quality and safety, and consider actions relating to climate change, in the design and construction of infrastructure, including dams;

- To avoid or minimize community exposure to project-related traffic and road safety risks, communicable and other diseases**,** and hazardous materials; and
- To ensure that the safeguarding of personnel and property is carried out in a manner that avoids or minimizes risks to the project-affected communities.
- To have in place effective measures to address community emergency events.

ESS4 requires the Borrower to design, construct, operate, and decommission the structural elements of the project in accordance with national legal requirements, the EHSGs and other GIIP, taking into consideration safety risks to third parties and affected communities.

Where the project involves provision of services to communities, the Borrower shall establish and implement appropriate quality management systems to anticipate and minimize risks and impacts that such services may have on community health and safety. In such circumstances, the Borrower shall also apply the concept of universal access, where technically and financially feasible.

TANROADS shall identify, evaluate and monitor the potential traffic and road safety risks to workers, affected communities and road users throughout the project life cycle and, where appropriate, shall develop measures and plans to address them. TANROADS shall incorporate technically and financially feasible road safety measures into the project design to prevent and mitigate potential road safety risks to road users and affected communities.

Construction activities (excavation, vehicle operations, work at height, use of chemicals, use of crane or other heavy equipment, etc.) may have irreversible effects of disability or fatality to community. Localized negative impacts (like dust emissions, accidents, etc.) to sensitive receptors such as schools, religious buildings and community centers shall need to be managed. The Project shall require Contractors to prepare appropriate plans for emergency preparedness and response, management and safety of hazardous materials, traffic and road safety, security personnel, etc. as per the requirements of ESS4.

Implementation of the Project shall trigger influx of workers or job seekers and their followers into the Project area. The project workforce could facilitate an increase risk in the incidence of SEA/SH/GBV, and as well as the transmission of communicable diseases, such as HIV/AIDS and COVID-19, to members of the local/host communities.

As the situation permits and depending on the public health circumstances, the project shall ensure compliance with national law, policies and protocol requirements as well as World Health Organization and World Bank guidance regarding the COVID-19 situation in relation to stakeholders' consultations, project worksites and related areas.

ESS4 also requires assessment of risks associated with security personnel, and review and reporting unlawful and abusive acts to relevant authorities, in projects where security

personnel are used to provide security services to guard staff and equipment. In such cases, the Contractors shall be required to prepare and implement a Security Management Plan.

v. Land Acquisition, Restrictions on Land Use and Involuntary Resettlement (ESS 5) – Applicable.

ESS5 recognizes that project-related land acquisition and restrictions on land use can have adverse impacts on communities and persons. Project-related land acquisition or restrictions on land use may cause physical displacement (relocation, loss of residential land or loss of shelter), economic displacement (loss of land, assets or access to assets, leading to loss of income sources or other means of livelihood), or both. The term "involuntary resettlement" refers to these impacts. Resettlement is considered involuntary when affected per sons or communities do not have the right to refuse land acquisition or restrictions on land use that result in displacement. The project RAP has been presented separately as part of this ESIA are in line with other national law, the DIST RPF and ESS5 requirements.

Objectives of ESS5 include:

- To avoid involuntary resettlement or, when unavoidable, minimize involuntary resettlement by exploring project design alternatives;
- To avoid forced eviction.

- To mitigate unavoidable adverse social and economic impacts from land acquisition or restrictions on land use by: (a) providing timely compensation for loss of assets at replacement cost and (b) assisting displaced persons in their efforts to improve, or at least restore, their livelihoods and living standards, in real terms, to pre-displacement levels or to levels prevailing prior to the beginning of project implementation, whichever is higher;
- To improve living conditions of poor or vulnerable persons who are physically displaced, through provision of adequate housing, access to services and facilities, and security of tenure;
- To conceive and execute resettlement activities as sustainable development programs, providing sufficient investment resources to enable displaced persons to benefit directly from the project, as the nature of the project may warrant; and
- To ensure that resettlement activities are planned and implemented with appropriate dis closure of information, meaningful consultation, and the informed participation of those affected.

Involuntary land acquisition, restrictions on land use and involuntary resettlement shall take place during the implementation of the proposed project. In line with DIST Resettlement Policy Framework (RPF), a Resettlement Action Plan (RAP) has been prepared as part of this ESIA report for the proposed roads Project.

vi. Biodiversity Conservation and Sustainable Management (ESS-6) – Applicable.

ESS6 recognizes the importance of maintaining core ecological functions of habitats, including forests, and the biodiversity they support. This ESS also addresses sustainable management of primary production and harvesting of living natural resources. ESS6 recognizes the need to consider the livelihood of project-affected parties, including Indigenous Peoples, whose access to, or use of, biodiversity or living natural resources may be affected by a project. The potential, positive role of project affected parties, including Indigenous Peoples, in biodiversity conservation and sustainable management of living natural resources is also considered.

Objective of ESS-6 include but not limited to:

- To protect and conserve biodiversity and habitats;
- To apply the mitigation hierarchy and the precautionary approach in the design and implementation of projects that could have an impact on biodiversity;
- To promote the sustainable management of living natural resources; and
- To support livelihoods of local communities, including Indigenous Peoples, and inclusive economic development, through the adoption of practices that integrate conservation needs and development priorities.

The proposed roads pass through grossly modified habitats and this ESIA addresses the requirements of ESS 6 by providing a detailed baseline social and biological conditions so as to inform thorough consideration of direct, and indirect project-related impacts on habitats and the biodiversity they support. There is no natural or critical habitat in the areas where the subprojects/roads will be implemented. The project supports the rehabilitation and upgrading of existing roads and neighbourhood roads in an urban area that has already been affected by man-made sources and is therefore not expected that construction activities in the road alignment itself will considerably impact natural habitats. The location of offsite facilities (such as quarries, borrow pits and contractor camps) are usually selected by the contractor after contract award and, hence, their impacts on biodiversity and natural will be identified in general terms by Contractor's ESMP, which identifies baseline conditions in the project area including locations of natural habitats and sensitive receptors (such as protected areas, key biodiversity areas, wetlands, biological corridors, mammals or important birds areas, among others) that will need to be avoided by contractors when identifying offsite facilities.

vii. Cultural Heritage (ESS-8) – Applicable.

This ESS sets out general provisions on risks and impacts to cultural heritage from project activities.

Objectives of the ESS8 include:

- To protect cultural heritage from the adverse impacts of project activities and support its preservation;
- To address cultural heritage as an integral aspect of sustainable development;
- To promote meaningful consultation with stakeholders regarding cultural heritage; and

- To promote the equitable sharing of benefits from the use of cultural heritage.

Through the environmental and social assessment, the Borrower shall determine the potential risks and impacts of the proposed activities of the project on cultural heritage. Para 9 of ESS-8 requires the Borrower to avoid impacts on cultural heritage by observing Chance Finding Procedures. When avoidance of impacts is not possible, the Borrower shall identify and implement measures to address impacts on cultural heritage in accordance with the mitigation hierarchy. ***The proposed*** roads ***pass to the areas with no sensitive cultural heritage site or historical antiquities and this ESIA contains part of (Chance findings procedures) that shall address the Cultural Heritage issues in case it shall be found along the road during construction phase and shall inform the respective Authority as per requirements.***

viii. Stakeholders Engagement and Information Disclosure (ESS-10) – Applicable.

This ESS recognizes the importance of open and transparent engagement between the Borrower and project stakeholders as an essential element of good international practice. Effective stakeholder engagement can improve the environmental and social sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation.

Objectives of ESS-10 are:

- To establish a systematic approach to stakeholder engagement that shall help Borrowers identify stakeholders and build and maintain a constructive relationship with them, in particular project-affected parties;
- To assess the level of stakeholder interest and support for the project and to enable stake-holders' views to be taken into account in project design and environmental and social performance;
- To promote and provide means for effective and inclusive engagement with project-affected parties throughout the project life cycle on issues that could potentially affect them;
- To ensure that appropriate project information on environmental and social risks and impacts is disclosed to stakeholders in a timely, understandable, accessible and appropriate manner and format; and
- To provide project-affected parties with accessible and inclusive means to raise issues and grievances, and allow Borrowers to respond to and manage such grievances.

The DIST has prepared a Stakeholder Engagement Plan (SEP) which guided consultations during the preparation of this ESIA report for the proposed roads.

3.3.3.2 The World Bank Group General Environmental, Health and Safety (EHS)

The Environmental, Health, and Safety (EHS) Guidelines are technical reference documents with general and industry-specific examples of Good International Industry Practice (GIIP). The applicability of the EHS Guidelines should therefore be tailored to the impacts and risks identified for projects on the basis of the results of an environmental assessment in which

site-specific variables, such as assimilative capacity of the environment and other project factors are taken into account.

Effective management of environmental, health, and safety (EHS) issues entails the inclusion of EHS considerations into project operations in an organized, hierarchical approach that includes the following steps:

- Identifying EHS project hazards and associated risks as early as possible in the facility development or project cycle, including the incorporation of EHS considerations into the site selection process, engineering planning process for capital requests, engineering work orders, facility modification authorizations, or layout and process change plans.
- Involving EHS professionals, who have the experience, competence, and training necessary to assess and manage EHS impacts and risks, and carry out specialized environmental management functions including the preparation of project or activity-specific plans and procedures that incorporate the technical recommendations presented in the ESIA document that are relevant to the project.

Understanding the likelihood and magnitude of EHS risks, based on:

- The nature of the project activities, such as whether the project shall generate significant quantities of emissions or effluents, or involve hazardous materials or processes;
- The potential consequences to workers, communities, or the environment if hazards are not adequately managed, which may depend on the proximity of project activities to people or to the environmental resources on which they depend.
- Prioritizing risk management strategies with the objective of achieving an overall reduction of risk to human health and the environment, focusing on the prevention of irreversible and /or significant impacts.
- Favoring strategies that eliminate the cause of the hazard at its source.
- When impact avoidance is not feasible, incorporating engineering and management controls to reduce or minimize the possibility and magnitude of undesired consequences.
- Preparing workers and nearby communities to respond to accidents, including providing technical and financial resources to effectively and safely control such events, and restoring workplace and community environments to a safe and healthy condition; and
- Improving EHS performance through a combination of ongoing monitoring of facility performance and effective accountability.

Also, the project should implement the relevant requirements from the Environmental, Health, and Safety Guidelines for Construction Materials Extraction.

3.3.3.3 Environmental, Health, and Safety Guidelines for Construction Materials Extraction in Tanzania

In Tanzania, the Environmental, Health, and Safety Guidelines (EHSGs) for Construction Materials interact closely with national environmental and labour regulations, including the Environmental Management Act 2004 and its accompanying EIA regulations, the Occupational Health & Safety Act, the Factories Act, Mining Act 2010, standards overseen by the Tanzania Bureau of Standards (TBS), and explosives control under the Explosives Act . Together, they establish a framework for safer, more sustainable extraction of sand, gravel, clay, limestone, and other construction aggregates. They outline performance levels and technical measures achievable using existing technologies and designed to guide all stages of extraction, from planning to closure.

Top soil conservation sites should be clearly demarcated, avoiding no-go zones unless formally approved. Borrow pits and haul roads will be sited considering local ecosystems and hydrology. Permits from local authorities, reflecting national and Mtaa-level planning mandates.

Topsoil removal is essential. It should be stripped from extraction areas, stockpiled at low heights (≤1 m) to preserve microbial activity, and retained for use in post-extraction restoration consistent with both EHSG and Tanzanian good-practice requirements.

- Dust from blasting, trucking, crushing, and stockpiles should be controlled via periodic watering of roads, covering of material, and enclosures for crushers and conveyors, aiming to meet both EHSG benchmarks and TBS air quality standards .
- To reduce nuisance and health impacts, operators should maintain equipment, choose low-noise machinery, use acoustic barriers, and restrict operations to daylight hours, respecting both international EHSGs and Tanzanian noise regulation.
- Extraction sites should be restored through backfilling, shaping, and revegetating disturbed land using native species. Where sensitive habitats exist, buffer zones and seasonal restrictions are recommended. Rehabilitation plans and performance bonds mandated by Environmental Management Acts must support these activities.
- Machines should have guards on moving parts, regular maintenance, and operated by trained personnel. Excavations require proper shoring, safe access, edge protection, and constant supervision per the Factories Act Tanzania Laws.
- Workers exposed to high noise levels should be provided with hearing protection. Ergonomic protocols should govern worker rotations, lifting, and posture to prevent musculoskeletal injuries.
- Mandatory PPE includes helmets, gloves, protective footwear, and high-visibility clothing. In contractors' side, there will be safety supervisors, workplace signage, and regular training in line with Tanzania's construction rules.
- Construction vehicles must be managed using flag personnel and secured haul roads. Roadways outside the site must be kept clean, and dust mitigation measures employed to protect the public.

- Where blasting is required, extraction companies should schedule events to limit community disruption, issue public notices beforehand, control timing and fly-rock, and maintain noise within acceptable limits consistent with EHSG measures.

The Tanzania the International Finance Corporation (IFC) approach aligns with global efforts such as IFC's Cement Decarbonization Tool and the Market Accelerator for Green Construction (MAGC), which emphasize reducing emissions, improving materials efficiency, and promoting sustainable extraction.

3.3.3.4 The World Bank Group Environmental, Health, and Safety Guidelines for Toll Roads

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

The EHS Guidelines for Toll Roads include information relevant to construction, operation and maintenance of large, sealed road projects including associated bridges and overpasses. Issues associated with the construction and operation of maintenance facilities are addressed in the General EHS Guidelines. Issues associated with sourcing of construction materials are presented in the EHS Guidelines for Construction Materials Extraction, while those related to vehicle service areas are included in the EHS Guidelines for Retail Petroleum. The EHS Guidelines for Toll Roads is organized according to the following sections:

- Section 1.0 — Industry-Specific Impacts and Management.
- Section 2.0 — Performance Indicators and Monitoring.
- Section 3.0 — References and Additional Sources.
- Annex A — General Description of Industry Activities.

When host country regulations differ from the levels and measures presented in the EHS Guidelines, projects are expected to achieve whichever is more stringent. If less stringent levels or measures than those provided in these EHS Guidelines are appropriate, in view of specific project circumstances, a full and detailed justification for any proposed alternatives is needed as part of the site-specific environmental assessment. This justification should demonstrate that the choice for any alternate performance levels is protective of human health and the environment.

3.3.4 International Agreements

Tanzania has ratified a number of Multilateral Environmental Agreements (MEAs) and consequently is bound by obligations under these agreements. The most relevant MEAs to this particular project are as included in the table below:

Table 3.1: International Conventions

Type of Convention	Name of Convention	Relevance
Biodiversity related Conventions	a. Convention of Biological Diversity, (1992) ratified by Tanzania in 1996), b. Convention to combat, desertification, particular Africa, Paris 1994, c. The Cartagena Protocol on Bio safety to the convention on Biological Diversity (2000)	a. Project activities shall involve clearing of vegetation in some road sections and from borrow sites, quarry sites and camp sites. Re-vegetation shall be carried out upon completion of the works. b. The project works shall entail measures geared towards minimizing habitat and species loses in areas where works shall be on-going. c. The road project study has revered that no any critical biological habitat to be affected by the road project
Climate change conventions	The United Nations Framework convention on climatic change (1992), Kyoto Protocol (1997)	The project activities shall put in measures to control emission of greenhouse into the atmosphere and such measures include no open burning of biomass as well as having waste management measures amongst others. ensuring project equipment is well maintained.
ILO Conventions	a. Forced Labour Convention, 1930 (Nº. 29); b. Freedom of Association and Protection of the Right to Organise Convention, 1948 (Nº. 87); c. Right to Organise and Collective Bargaining Convention, 1949 (Nº. 98); d. Equal Remuneration Convention, 1951 (Nº. 100); e. Abolition of Forced Labour Convention, 1957 (Nº. 105); f. Discrimination (Employment and Occupation) Convention, 1958 (Nº. 111); g. Minimum Age Convention, 1973 (Nº. 138); h. Discrimination (Employment and Occupation) Convention, 1958 (Nº. 111); i. Minimum Age Convention, 1973 (No. 138); j. Worst Forms of Child Labour Convention, 1999	The project shall draw up labor management plan with incorporation of the Eight (8) ILO Convention as well as ensuring that Employment and Labor Relations Act, 2004

	(Nº. 182); k. Worst Forms of Child Labour Convention, 1999 (Nº. 182).	
Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).	Convention on International Trade in Endangered Species of Wild Fauna and Flora	The project shall ensure the workers do not engage in illegal exploitation of exploitation of wildlife as well as plants in the protected areas through closer collaboration with agencies under Tanzania Wildlife Management Authority (TAWA).
Regional conventions	a. The Convention on the conservation of Nature and Natural Resources, 1968 Algiers, (1968); b. The Bamako convention on the Ban of the import into Africa and the control of Trans-boundary movement of Hazardous Wastes within Africa 1990; and c. Nairobi Convention for the protection, management and development of the Marine and Coastal environment of Eastern African Region, 1985 and the related protocols.	All importations of chemicals such as explosives materials shall follow national legislations on the Industrial and Consumer Chemicals (Management and Control) Act Nº. 3 of 2003
Other conventions	a. Basel convention on the control of Trans boundary movements of Hazardous Waste and their Disposal, 1989; b. Stockholm Convention on Prior Informed Organic Pollutants; c. Vienna Convention on protection of Ozone Layer; d. The Montreal protocol on substances that deplete the ozone layer, Montreal, 1987; e. Protocol on Liability and compensation on Damage resulting from Trans boundary movement of Hazardous waste and their disposal, 2000.	All wastes generated in the project shall be management based on the measures stipulated in the Waste Management Plan as well as best practices under Environment Management Act 2004.

3.4 Environmental Management Regulation and Policies in Tanzania

A clean and safe environment is the constitutional right of every Tanzanian citizen. Regulation on environmental management in the country is mainly vested on two public institutions, the National Environment Management Council (NEMC) and the Division of Environment (DoE) in the office of the Vice President. The NEMC undertakes enforcement, compliance, and review of environmental impact statements whereas the DoE provides the policy formulations and technical back-up and executes the overall mandate for environmental management in the country. There are many policies and pieces of legislation on environmental management in Tanzania, the relevant ones to this project are briefly discussed below.

Environmental awareness in the country has significantly increased in recent years. The government has been developing and reviewing national policies to address environmental management in various sectors. Among others, the objective of these policies is to regulate the development undertaken within respective sectors so that they are not undertaken at the expense of the environment. The national policies that address environmental management as far as this project is concerned and which form the cornerstone of the present study include the following:

3.4.1 National Environmental Policy (NEP) of 2021

The National Environmental Policy of 2021 has just been launched in February 2021. The new policy formulation is a revision of the National Environmental Policy of 1997. The Policy serves as a national framework for planning and sustainable management of the environment in a coordinated, holistic and adaptive approach taking into consideration the prevailing and emerging environmental challenges as well as national and international development issues. Effective implementation of this policy requires mainstreaming of environmental issues at all levels, strengthening institutional governance, and public participation in environmental management regimes. The long-term vision of this policy is geared towards the realization of environmental integrity, assurance of food security, poverty alleviation, and increased contribution of the environmental resources to the national economy. It also recommends strong institutional and governance measures to support the achievement of the desired objectives and goals.

The policy seeks to promote the economy and livelihoods of people while promoting sustainable utilization of natural resources in the country. The policy provides the framework for the formulation of plans, programs, and guidelines for the achievement of sustainable development.

The policy's overall objective is to provide a national framework for guiding harmonized and coordinated environmental management for the improvement of the welfare of present and future generations. The specific objectives are i) to strengthen coordination of environmental management in sectors at all levels; ii) to enhance environmentally sound management of land resources for socioeconomic development; iii) to promote environmental management of water sources; iv) to strengthen conservation of wildlife habitats and biodiversity; v) to

enhance conservation of forest ecosystems for sustainable provision of environmental goods and services; vi) to manage pollution for the safe and healthy environment; vii) to strengthen the national capacity for addressing climate change impacts; viii) to enhance conservation of aquatic system for the sustained natural ecosystem; ix) to ensure safety at all levels of application of modern biotechnology; x) to promote gender consideration in environmental management; xi) to promote good governance in environmental management at all levels; and xii) to ensure predictable, accessible, adequate and sustainable financial resources for environmental management.

The revised environmental policy in Tanzania is relevant to the proposed road sections under DIST since it brings forth the foundation of environmental sustainability of development projects translated by having environmental impact assessment study a mandatory undertaking before their implementation.

3.4.2 National Transport Policy (2011)

The vision of this policy is "to have an efficient and cost-effective domestic and international transport service to all segments of the population and sectors of the national economy with maximum safety and minimum environmental degradation". Its mission is to "*Develop safe, reliable, effective, efficient and fully integrated transport infrastructure and operations which shall best meet the needs of travel and transport at improving levels of service at lower costs in a manner which supports government strategies for socio-economic development whilst being economically and environmentally sustainable*".

The National Transport Policy acknowledges that in the rural areas of Tanzania the transport situation is highly affected by poor infrastructure, specifically roads. Hence the key objective of the transport policy is to improve the transport infrastructure to enable easier movement of agricultural and livestock inputs and outputs to and from rural and urban areas. Agricultural and Livestock inputs need to be transported into villages and surplus outputs need to be transported to markets that are normally located in urban areas. To facilitate such goals, efficient and all-weather roads are needed.

In the transport sector, the main objective of the policy is to improve infrastructure whilst minimizing wasteful exploitation of natural resources and enhancing environmental protection. Improving infrastructure assists in poverty reduction and eradication which is a major goal in Tanzania. Most activities in the project area depend in one way or another on the environment and therefore protection of the environment is vital.

To promote environmental protection whilst reducing poverty in rural areas, the policy direction is to:

- Influence use of alternative energy sources such as biogas and solar available at the residential localities instead of traveling long distances in search of firewood as a source of power; and
- Raise environmental awareness.

Sections 5.9 and 6.13 on Road Transport and Environment respectively give policy directions towards enhancing environmental protection through environmentally friendly and sustainable transport infrastructure both in the rural and urban areas. The proposed improvement of road sections under DIST shall adopt this policy since the project road shall provide a reliable means of goods and agriculture products from the farms to the markets.

3.4.3 National Mineral Policy 2009, Amended 2019

The National Mineral Policy requires that mining activities are undertaken sustainably. Reclamation of land after mining activities is recommended. Section 3.3.12 states that "*To ensure Sustainability of mining there is a need to Integrate Environmental and Social concerns into Mineral development programs. Sustainable mining development requires balancing the protection of flora and fauna and Natural Environment with the need for social and economic development*." As far as this project is concerned, mining activities refer to quarrying and gravel extraction activities.

3.4.4 National Construction Industry Policy (2003)

The road sector is among the key areas covered by this policy. Among the major objectives of the policy, which supports a sustainable road development sector, including the promotion and application of cost-effective and innovative technologies and practices to support socio-economic development activities such as road-works, water supply, sanitation, shelter delivery, and income-generating activities and to ensure application of practices, technologies, and products which are not harmful to either the environment or human health. TANROADS shall adopt this policy by using modern technology during construction but with emphasis on value for money for a cost-effective project.

3.4.5 National Land Policy (1995)

The National Land Policy states that “the overall aim of a National Land Policy is to promote and ensure a secure land tenure system, to encourage the optimal use of land resources, and to facilitate broad-based social and economic development without upsetting or endangering the ecological balance of the environment”. This EIA partly responds to this requirement.

3.4.6 National Energy Policy (2015)

The first energy policy for Tanzania was formulated in April 1992. Since then, the energy sector has undergone several changes, necessitating adjustments to this initial policy. These changes include changes in the role of the government from a service provider to a facilitator, liberalization of the market, and encouragement of private sector investment. The overall objective of the National Energy Policy of 2003 is to contribute to the development process by establishing efficient energy production, procurement, transportation, distribution, and end-user systems in an environmentally sound manner and with due regard to gender issues.

The continuing decline in industrial and agricultural production during the period between 1980 and 1985 led to increased inflation and a decline in the standard of living. To arrest this decline, the government gave priority to the upgrading of basic transport infrastructure, especially roads and communication, so that they can fully support the economic production

sector. The energy policy considers the condition of roads as a determinant factor in vehicle energy use. Rough and pothole-filled roads necessitate frequent braking and acceleration, leading to wasteful use of fuel. The project road shall provide a smooth, well-surfaced, and well-maintained road which leads to energy savings.

3.4.7 National Human Settlements Development Policy (2002)

Among the objectives of this policy that touch the road sector is to improve the level of the provision of infrastructure and social services for the development of sustainable human settlements and to make serviced land available for shelter to all sections of the community. Such infrastructure and services constitute the backbone of urban/rural economic activities. The proposed road sections under DIST are reliable and efficient transport system which are essential to increase productivity and the establishment of small manufacturing industries.

3.4.8 National Gender Policy (2002)

The key objective of this policy is to provide guidelines that shall ensure that gender-sensitive plans and strategies are developed in all sectors and institutions. While the policy aims at establishing strategies to eradicate poverty, it emphasizes gender quality and equal opportunity of both men and women to participate in development undertakings and to value the role played by each member of society.

The ministry of works and TANROADS has adopted the policy through the provision of equal opportunities to both men and women in road works and related activities. This project shall also ensure that women, who are also the users of the infrastructure, shall be adequately involved at all levels of project planning to implementation.

3.4.9 The National Water Policy (2002)

The overall objective of this policy is to develop a comprehensive framework for the sustainable management of national water resources. The policy seeks to ensure that water plays an important role in poverty alleviation. Section 2.15 notes that the size of Tanzania means that communication is time-consuming and expensive. Inadequate communication systems (including poor roads) affect the effective implementation of water resources management activities in terms of the higher cost of monitoring, supervision, management, policing, and data transfer. The proposed road sections under DIST shall help to alleviate accessibility problems and thus facilitate the enhancement of water resources management within the project influence area.

3.4.10 National Forestry Policy (1998)

The national forest policy is based on the macro-economic, environmental, and social framework. Its overall aim is to manage Tanzania's forest resources as a national heritage on an integrated and sustainable basis to optimize their environmental, economic, social, and cultural values. The policy drives towards implementing the directives contained in the National Environmental Policy (1997) concerning forest resources management. For instance, the forest policy advocates and directs the conduction of EIA for development

projects that shall affect forest reserves including services crossing them (e.g. roads). During the construction phase, contractor shall observe this policy.

3.4.11 National Agricultural Policy (2013)

Agricultural development depends heavily on good infrastructures, such as roads, communication, energy, marketing facilities, and efficient transport services. Good infrastructure and transport systems are essential elements for the movement of agricultural produce, goods, and services to and from rural areas that are vital stimulants to the development of the rural economy. Infrastructure developments particularly in rural areas are vital determinants of transaction costs in agriculture and hence the absence of good infrastructure, in turn, affects the sector's competitiveness. Passable roads, adequate energy, efficient communication, and marketing infrastructure are important in stimulating agricultural growth and development in rural areas. Nevertheless, inaccessibility of rural areas due to poor rural roads; poor communication facilities; inadequate rural electrification; high transport costs; and inadequate market infrastructure affect the profitability of agriculture.

The objective of this policy regarding infrastructure states that "*Rural infrastructure and transport systems improved to reduce transaction costs that affect agricultural growth and competitiveness*." The Policy Statements includes

i. Rural road connectivity for improved agricultural development shall be facilitated in collaboration with the ministry responsible for infrastructure and the Prime Minister's Office-Regional Administration and Local Government (PMO-RALG);
ii. A conducive environment for Public-Private Partnerships in infrastructure development particularly in rural areas shall be created; and
iii. Availability and accessibility to rural electrification, water, communication, transport services, and market infrastructure shall be facilitated.

Enhancing agriculture in the project area is one of the main objectives of this project.

3.4.12 National Policy on HIV/AIDS (2001)

The National Policy on HIV/AIDS (2001) was formulated by the Government of Tanzania (GoT) under technical support from the World Health Organization Global Programme on AIDS (WHO-GPA) that led to the establishment of the National HIV/AIDS Control Programme (NACP) under the Ministry of Health. However, due to its multi-sectoral nature, there was a need to involve all sectors and community participation was found to be crucial. One of the government strategic initiatives is to establish Tanzania Commission for AIDS (TACAIDS) under the Prime Minister's Office. The Commission provides leadership and coordination of national multi-sectoral response to the HIV/AIDS epidemic. The management functions, institutional and organizational arrangement of TACAIDS are outlined in the National Policy.

The policy identifies HIV/AIDS as a global disaster, hence requiring concerted and unprecedented initiative at national and global levels. It recognizes HIV/AIDS as an impediment to development in all sectors, in terms of social and economic development with serious and direct implications on social services and welfare. Thus, the policy recognizes

the linkage between poverty and HIV/AIDS, as the poor section of society is the most vulnerable.

The main policy objective is reflected well in the establishment of TACAIDS. However, the policy has also set several strategic objectives to deal with specific HIV/AIDS problems:

- Prevention of transmission of HIV/AIDS;
- HIV Testing;
- Care for People Living with HIV/AIDS (PLHAS);
- Enhance Sectoral roles through participation and financial support;
- Promote and participate in research on HIV/AIDS-including dissemination of scientific information and development of HIV vaccine;
- Creating a legal framework through the enactment of laws on HIV/AIDS-governing ethical issues and legal status of HIV/AIDS-affected families;

Other objectives:

- monitoring and safeguarding rights of infected or affected people;
- prevent human rights abuse, discrimination, and social injustice;
- provide effective treatment for opportunistic diseases;
- promote fight against drug substance abuse;
- Prohibit misleading advertisements of drugs and other products for HIV/AIDS prevention, treatment, and care.

The proposed road sections under DIST can be a precursor of Incidents of HIV/AIDS due to the influx of people into the area including construction workers. This would result in an increase in the incidence of diseases including STI, and HIV/AIDS.

3.4.13 Wildlife Policy of Tanzania (2007)

The vision of the wildlife sector for the next 20 years conforms to the Development Vision 2025 on sustainable environmental and socio-economic transformation. *Inter alia,* the vision of the wildlife sector is to:

- Promote conservation of biological diversity;
- Administer, regulate and develop wildlife resources;
- Involve all stakeholders in wildlife conservation and sustainable utilization, as well as in fair equitable sharing of benefits;
- Promote sustainable utilization of wildlife resources; and
- Contribute to poverty alleviation and improve the quality of Tanzania.

The Wildlife Policy envisages addressing several national challenges. For instance, conserving representative areas of the key habitats with great biological diversity; continuing to support and where necessary, enlarge the protected area network as the core of conservation activities; integrating wildlife conservation with rural development; and minimizing human-wildlife conflicts whenever it occurs.

The proposed road improvement project can interfere with such challenges for which the policy needs to tackle. All stages involved in the project can contribute some impacts on the

wildlife. Most importantly, this project does not crosse any of the protected areas. Therefore wildlife along the project road shall not be impacted.

3.4.14 National Livestock Policy (2006)

The rationale of the National Livestock Policy is to commercialize the industry and stimulate its development while conserving the environment. The aim is to support the livelihoods of livestock farmers through increased incomes and self-sufficiency in food of animal origin and thus addressing the goals set in the National Strategy for Growth and Reduction of Poverty (NSGRP) of 2004.

The Policy has taken into account the comparative advantage the country has as regards the large livestock population compared to most African countries. It has also considered current developments in trade liberalization, globalization, privatization and divestiture of state enterprises, enhancement public-private partnership, advances in science and technology, which have a direct impact on the development of the livestock industry. The Policy further emphasizes the importance of value addition to access competitive markets and to prolong the shelf-life of livestock products. Tanzanian population is expected to increase to 55.2 million by the year 2025 thereby significantly increasing demands for livestock and livestock products; therefore, a need for special emphasis on the improvement of livestock productivity. Therefore, the roads improvement are the step the government has taken to promote livestock keeping as described in this policy.

3.4.15 National Employment Policy (2008)

The National Employment Policy identifies two categories of employment namely wage employment and self-employment. The policy revisits the state of employment in Government, Parastatals, Private sector, and Informal Sector. This policy is the vision leading to utilization of available labor force and tapping available natural resources. The policy also identifies strategies for exploiting existing wealth, especially in sectors dealing with Industry and trade, Agriculture and livestock, Fisheries, Service sector, and small-scale mining. On top of that, it identifies special groups which require special treatment while seeking employment and proposes responsibilities of different authorities to deal with different aspects of the policy. This project shall employ local people during construction and therefore it is in line with this policy.

3.5 Legal Framework

3.5.1 Environmental Management Act No. 20 of (2004), Cap. 191

The Environmental Management Act (EMA) is a piece of legislation that forms an umbrella law on environmental management in Tanzania. Its enactment has repealed the National Environment Management Council Act. 19 of (1983) while providing for the continued existence of the National Environment Management Council (NEMC).

Among the major purposes of the EMA are to provide the legal and institutional framework for sustainable management of the environment in Tanzania; to outline principles for management, impact and risk assessment, the prevention and control of pollution, waste

management, environmental quality standards, public participation, compliance, and enforcement; to provide the basis for the implementation of international instruments on the environment; to provide for the implementation of the National Environmental Policy; to provide for the establishment of the National Environmental Fund and to provide for other related matters.

Part III, Section 15(a) states that "*in matters about the environment, the Director of Environment shall coordinate various environment management activities being undertaken by other agencies to promote the integration of environmental considerations into development policies, plans, programs, strategies projects and undertake strategic environmental assessments to ensure the proper management and rational utilization of environmental resources on a sustainable basis for the improvement of the quality of human life in Tanzania*".

Part VI of the EMA deals with Environmental Impact Assessments (EIA) and other Assessments and directs that an EIA is mandatory for all development projects. Section 81(2) states that "*An Environmental Impact Assessment study shall be carried out before the commencement or financing of a project or undertaking*", while Section 81(3) states "*a permit or license for the carrying out of any project or undertaking following any written law shall not entitle the proponent or developer to undertake or to cause to be undertaken a project or activity without an environmental impact assessment certificate issued under this Act*". This EIA is conducted for this project to abide by this law.

Part IX of the law provides for waste management sections. Section (a) provides for Solid waste management, Section (b) provides for management of litter, Section (c) provides for liquid waste management, Section (d) provides for gaseous wastes, and section (e) provides for hazardous waste management. This part stresses waste minimization at that end of pipe treatment. It gives a mandate to local governments to create bylaws for waste management in their areas. These sections shall be observed during all phases of the project.

Part X of the law deals with Environmental Quality Standards. Section 140 of this act states that "*The National Environmental Standards Committee of the Tanzania Bureau of Standards established under the Tanzania Bureau of Standards Act, 1975 shall develop, review and submit to the Minister proposal for environmental standards and criteria concerning; water quality; discharge of effluent into the water; air quality; control of noise and vibration pollution; sub-sonic vibrations; soil quality, control of noxious smells; light pollution; and any other environmental quality standard*" Some of these standards have already been published in the government *gazette* while others are not in place. This project shall take into account all the standards specified by this act.

3.5.2 Land Act No. 2/04 (2004), amendment of the Land Act (1999)

These laws declare all land in Tanzania to be "Public land" to be held by the state for public purposes. The Acts empower the President of the United Republic of Tanzania, to revoke the

"Right of Occupancy" of any landholder for the "public/national interest" should the need arise. The laws also declare the value attached to the land.

Land tenure system

The existing land ownership system has a history of more than forty years. At present, the Land Act (1999) and the Village Land Act (1999) guide land ownership in Tanzania. The laws vest all land in the President and grant occupancy rights to individuals, legal persons, and territorial communities. The President holds *land in trust* for all citizens and can acquire land for public use and benefit, for instance, to resettle people from densely populated areas to sparsely populated areas, settle refugees, and so forth. The President can also acquire land for other national projects, like road construction.

Compensation rules

Under the Government Standing Order on expropriation for public utility, the holder of a Right of Occupancy is guaranteed a free enjoyment of the land and is entitled to compensation if dispossessed by the Government for public use. In many cases whilst the holders agree to leave their land, they are not happy with the amount and delay of the compensation. Often, for example, improvements that they have made to the land are omitted or underrated. The expropriation should match the price that improvements can fetch if sold in the open market. Replacement value (defined as the cost of putting up a structure equivalent to the evaluated one) makes allowance for age, state of repair, and economic obsolescence.

The compensation must therefore include: -

- The replacement value of the un-exhausted improvements
- Disturbance and transport allowance
- Loss of income
- Cost of acquiring or getting an equivalent land
- Actual value of the present property/utility available in the land and
- Any other immediate costs or capital expenditure incurred in the development of the land.

This project shall involve the resettlement of people and their properties, this law shall govern the whole process of valuation and compensation.

3.5.3 Road Act, 2007

For purposes of this project, the Road Act 2007 serves as a guide to the use of the road reserve. Contrary to previous informal understanding the reserve is exclusive to road-related activities that do not include other utilities. However, clause 29 (2) does give provision for the request and terms of approval for use of the road reserve by utilities such as power lines and water pipes.

On land acquisition, the Act clearly states in part III, Section 16 that *'where it becomes necessary for the road authority to acquire a land owned by any person, the owner of such land shall be entitled to compensation for any development on such land following the Land*

Act and any other written law'. TANROADS shall observe this law for the conservation of the road reserve.

3.5.4 Water Resources Management Act No. 11 of 2009

This is new legislation that has repealed the Water Utilization (Control and Regulation) Act (1974). The Act provides for an institutional and legal framework for sustainable management and development of water resources; outlines principles for water resources management; for prevention and control of water pollution; and provides for the participation of stakeholders and the general public in the implementation of the National Water Policy. Its main objective is to ensure that the nation's water resources are protected, used, developed, conserved, managed, and controlled in ways that among others meet the basic human needs of present and future generations, prevent and control pollution of water resources, and protects biological diversity, especially the aquatic ecosystems.

Following this law, all water resources in mainland Tanzania shall continue to be public water and vested in the President as the trustee for and on behalf of the citizens. The power to confer a right to the use of water from any water resource is vested in the Minister responsible for water. Several perennial and seasonal rivers cross the project road. Respective water basins authority shall be consulted before starting working in the rivers and before abstraction of water from the water bodies.

3.5.5 Public Health Act 2009

An Act provides for the promotion, preservation, and maintenance of public health with the view to ensuring the provision of comprehensive, functional, and sustainable public health services to the general public and to provide for other related matters. Section 54 of this law states that "*A person shall not cause or suffer from nuisance, likely to be injurious or dangerous to health, existing on land, premises, air or water*". Therefore, TANROADS shall develop this project road so that nobody suffers from nuisance or cause danger to people's life.

3.5.6 Land Use Planning Act (2007)

The Act provides for the procedures for the preparation, administration, and enforcement of land use plans; to repeal the National Land Use Planning Commissioning Act, and to provide for related matters. Among the objectives of the Act as given in Section 4 are to facilitate the orderly management of land use and to promote sustainable land-use practices. The project might necessitate the clearance for traffic diversion roads on either side of the project road which is the change of land use as the land was used for other purposes. This change in land use shall cause a change in livelihood, therefore TANROADS must comply with the provisions of this act. Any infringement on existing land use shall need a consultation with land use planning authorities.

3.5.7 Occupation Safety and Health Act (2003)

The law provides for safety, health, and welfare of persons at work in factories or other workplaces; to provide for the protection of persons other than persons at work against

hazards to health and safety arising out of or connection with activities of persons at work, and to provide for connected matters.

Section 62 of the law states that "*wherein a workplace, workers are employed in any process involving exposure to any offensive substance or environment, effective protective equipment shall be provided and maintained by the employer for the use of the persons employed*". In these road projects, the contractor shall provide PPEs as per provision of this act including, overall dress, boots, helmets, earplugs, etc depending on the exposure.

Section 58 presents the issue of first aid box and it states that "There *shall be provided and maintained a first aid box or cupboard to the prescribed standard and the first aid box or cupboard shall be distinctively marked "FIRST AID" having only appliances or stocks of first aid equipment*". A well-stocked first-aid kit shall be provided at the campsite.

Section 24 (1) states that "a thorough pre-placement and periodic occupational medical examination for fitness for employment and employees shall be carried out by a qualified occupational health physician or where necessary a qualified medical practitioner as may be authorized by the chief inspector". The contractor shall conduct a medical examination for all those who require employment before employing them.

3.5.8 Local Government Laws (Miscellaneous Amendment) No.13, 2006

The Local Government Act directs the registrar of villages to register an area as a village and issue a certificate of incorporation which enables the village council to become a corporate body with perpetual succession and official seal; in its corporate name a village is capable of suing and being sued, and a village is capable of holding and purchasing or requiring in any other way any movable or immovable property.

The Act gives authority to local governments to regulate local matters. A pertinent example of such authority to the project road is that the local government may opt to regulate the extraction of minerals or building material, through their by-laws. Despite the authority of local governments, the by-laws should not derogate any principal legislation e.g. in the case of extraction of material, the Mining Act.

3.5.9 The Standards Act No. 2 of 2009

An Act to provide for the promotion of the standardization of specifications of commodities and services, to re-establish the Tanzania Bureau of Standards (TBS) and to provide better provisions for the functions, management, and control of the Bureau, to repeal the standards Act, Cap.130 and to provide for other related matters. This act is relevant to the project as the quality of the bitumen/asphalt, and other products to be imported by the contractor during construction shall have to abide by the standards set by TBS.

3.5.10 National Forest Act, 2002

This Act deals with the protection of forests and forest products in forest reserves and the restrictions and prohibitions in forest reserves. Forest Management plans are administered under the Forest ordinance (1957). Any contravention of the restrictions and prohibition is

considered an offense under this ordinance and subject to enforcement. The law was revised in 2002 to meet the new requirements under the Forest Policy.

The new Forest Act No 14 of 2002 requires that for any development including mining development, construction of dams, power stations, electrical or telecommunication, and construction of building within a Forest Reserve, Private Forest or Sensitive Forest, the proponent must prepare an Environmental Impact Assessment for submission to the Director of Forestry. The law also requires licenses or permits for certain activities undertaken within the national or local forest reserves, such as, among others, felling or removing trees, harvesting forest produce, entering a forest reserve for tourism or camping, mining activities, occupation, or residence within the reserve, cultivation, erecting any structures. This EIA has been prepared to fulfill the requirements of this law.

3.5.11 Explosives Act, 56/63 (1963)

This Act gives the Commissioner for Mines responsibility for regulating explosives. First, section 3 stipulates that no import, manufacture, possession, acquisition, or disposition of explosives is allowed unless the substance is approved for use by the Commissioner. Sections 7-9 stipulate that a person must have a license from the Commissioner for Mines to legally manufacture explosives. The penalty for failure to have a license is 5,000 and/or 2 years. Part V of the Act further requires a permit for the transport of explosives. Part VI requires a permit for the acquisition, possession, and disposal of explosives. Part VII requires a permit for the storage of explosives. Part VIII requires a permit for use of explosives. An explosives permit can give conditions. The following applications and sample permits are included:

- Application for Import Permit
- Import Permit
- Import Permit (General Authority to Import Explosives)
- Application for License to Purchase or Acquire Explosives
- License to Purchase or Acquire Explosives
- Magazine License
- Explosive Store License
- Application for Blasting Certificate
- Blasting Certificate
- Return of Explosives

In addition to these general permitting requirements, section 12 provides that "*the person in charge of the explosives is liable if an "unauthorized person" has access thereto or possession thereof. Section 51 establishes general penalties of Tsh. 4,000 and/or 1 year*". Also, under section 53, "*the Commissioner has authority to revoke a license or blasting certificate*". For this project road, this applies to the use of material from any quarries where blasting is to be employed.

3.5.12 Regional and District Act No 9, 1997

The Act provides for Regional Commissioners to oversee Regional Secretariats, with District Commissioners directly supervising the District Councils. Local authorities oversee the local planning processes, including establishing local environmental policies.

The National Environmental Policy establishes a policy committee on Environment at the Regional level chaired by the Regional Commissioner, mirrored by environmental committee at all lower levels, i.e. at the District, Division, Ward and Village or Mtaa Councils.

Under the EMA 2004, the Regional Secretariat is responsible for the coordination for all advice on environmental management in their respective region and liaison with the Director of Environment. At the Local Government level, an Environmental Management Officer should be designated or appointed by each City, Municipal, District, or Town Council. In each City Municipality or District, Environmental Committees should be established to promote and enhance sustainable management of the Environment. The Village Development Committee is responsible for the proper management of the environment in their respective areas. The District Council designates each administrative area as township, ward, village, sub-street, and Environmental Management Officer to coordinate all functions and activities related to the protection of the environment in their area. TANROADS and Contractor shall observe all local environmental bylaws set by Dodoma Municipal Council together with those by Dodoma City Council Secretariats.

3.5.13 Mining Act No.4, 2010 (Revised Edition 2019)

This Act states that “building material” includes all forms of rock, stones, gravel, sand, clay, volcanic ash or cinder, or other minerals being used for the construction of buildings, roads, dams, aerodromes, or similar works but does not include gypsum, limestone being burned for the production of lime, or material used for the manufacture of cement.

This act makes sure minerals are well controlled and Section 6(1) states that "*no person shall, on or in any land to which this act refers, prospect for minerals or carry on mining operations except under the authority of Mineral Right granted, or deemed to have been granted under this Act.*" In additional section 50.-(1) (v) of the act states that "*The Minister shall grant an application for a mining license for minerals which has been properly made under section 49 and a successful application for a mining license made under section 71 unless the applicant has not included the relevant environmental certificate issued under the Environment Management Act*".For this project, the contractor shall apply for a mining permit before starting quarrying activities.

3.5.14 Land Acquisition Act 1967, Revised in 2012

Under the Land Acquisition Act, 1967, the President may, subject to the provisions of this Act, acquire any land for any estate or term where such land is required for any public purpose.

Land shall be deemed to be acquired for a public purpose where it is required, for example, for exclusive Government use, for general public use, for any Government scheme, for the development of agricultural land or for the provision of sites for industrial, agricultural or commercial development, social services, or housing or; where the President is satisfied that a corporation requires any land for the purposes of construction of any work which in his opinion would be of public utility or in the public interest or in the interest of the national economy, he may, with the approval, to be signified by resolution of the National Assembly and by order published in the Gazette, declare the purpose for which such land is required to be a public purpose and upon such order being made such purpose shall be deemed to be a public purpose; or in connection with the laying out of any new city, municipality, township or minor settlement or the extension or improvement of any existing city, municipality, township or minor settlement; etc.

Upon such acquisition of any Land, the President is compelled on behalf of the Government to pay in respect thereof, out of money provided for the purpose by Parliament, such compensation, as may be agreed upon or determined following the provisions of the Land Acquisition Act, 1967.

The President may also revoke a right of occupancy if in his opinion it is in the public interest to do so. Accordingly, the land for which a right of occupancy has been revoked reverts back to the Government for re-allocation according to the existing need (s). It should also be noted here that, though the land belongs to the government some changes to the land act have taken place. The land has value to the owner; therefore, any land taken from the user has to be compensated. Based on this act the villagers affected by the project are claiming that they should be compensated for the lost farms and land used for residential purposes. Any land acquisition that shall be done during the implementation of this project shall be guided by this law.

3.5.15 Wildlife Conservation Act No 5/09 of 2009

The prime purposes of this Act are;

- To make better provisions for the conservation, management, protection, and sustainable utilization of wildlife and wildlife products
- To repeal the Wildlife Conservation Act Cap. 283 and
- To provide for other related matters

Section 74 of the Act states that "*A human activity, settlement or any other development that shall adversely affect wildlife shall not be permitted within five hundred meters from the wildlife protected area borderline without the permission of the Director*."

Road construction and its use can be deleterious to the biological diversity of any place and any kind regardless of whether the area is protected or not. This project does not traverse near the protected areas, however, TANROADs shall see to it all provisions of this act are observed during construction.

3.5.16 Employment and Labor Relations Act No. 6 0f 2004

The Act makes provisions for core labor rights; establishes basic employment standards, provides a framework for collective bargaining; and provides for the prevention and settlement of disputes. TANROADS shall see to it that the Contractor adheres to employment standards as provided for by the law.

3.5.17 Engineers Registration Act 1997 (Amendments 2007)

The Acts regulate the engineering practice in Tanzania by registering engineers and monitoring their conduct. It establishes the Engineering Registration Board (ERB). Laws require any foreign engineer to register with ERB before practicing in the country. Foreign engineers working with this project shall abide by the law requirements.

3.5.18 Contractors Registration Act (1997)

The Contractors Registration Act requires contractors to be registered by the Contractors Board (CRB) before engaging in the practice. It requires foreign contractors to be registered by the Board before gaining contracts in Tanzania. TANROADS shall comply with the law requirement during the recruitment of contractors for project implementation.

3.5.19 HIV and AIDS (Prevention and Control) Act No. 28/08 (2008)

The law provides for public education and programs on HIV and AIDS. Section 8(1) of the law states that "The Ministry (Health), health practitioners, workers in the public and private sectors and NGOs shall provide HIV and AIDS education to the public, disseminate information regarding HIV and AIDS to the public". Furthermore, Section 9 states that "Every employer in consultation with the Ministry (Health) shall establish and coordinate a workplace program on HIV and AIDS for employees under his control and such programs shall include the provision of gender-responsive HIV and AIDS education.". This project shall abide by HIV/AIDS Act in the fight against the disease during construction.

3.5.20 Industrial and Consumer Chemical (Management and Control) Act, 2003

The Act provides for among other issues, importation, transportation, storage, use, and disposal of chemicals in Tanzania. Road Contractor/TANROADS is required by law to have a certificate from the Chief Government Chemist for importation, storage, or disposal of any chemicals (Asphalt, Lime, etc). Furthermore, Road Contractor/TANROADS as any other individual dealing with chemicals is required to comply with all provisions/regulations regarding packaging, handling, storage, use, and disposal of chemicals, as set by this Act. The minister appoints an inspector from time to time to ensure compliance. Compliance failure might lead to revocation of the certificate. This law shall guide the contractor and TANROADS on the importation of construction materials such as asphalt.

3.5.21 Petroleum Act, 2015

This act makes provisions for Importation, Exportation, Transportation, Transformation, Storage and wholesale and retail distribution of petroleum products in a liberalized market and to provide for related matters. Section 7 of the act restricts persons/Institutions from

performing petroleum supply operations without having obtained a license following the provision of this act. Section 8 (1) states that *"Before the issuance of the license, the applicant must comply with all necessary Environmental requirements as provided for under the Environmental Management Act.*" TANROADS and the contractor shall see to it that the provisions of this law are taken into a task during the construction.

Part IX of the law provides for petroleum supply operations which include; importation, transportation, transformation storage, and distribution. Section 33 (1) states that "*No person shall import petroleum or petroleum products unless the importation is conducted efficient procurement*" All the petroleum products to be imported for this project shall use efficient procurement as described by this act.
Section 37 deals with transportation and it states that "*No vehicle, vehicles or facility shall transport petroleum or petroleum products unless such vehicle, vessel or facility complies with the specifications made by the Minister"*. This section shall be observed during the transportation of petroleum products (especially asphalt) to the project site.

Section 43 (1) of the legislation states that "*Every person storing petroleum or petroleum products shall ensure that the petroleum products, as the case may be stored following the license issued by the authority*". A license shall be acquired for the storage of petroleum products for this project.

3.5.22 Executive Agencies Act (Cap 245)

TANROADS, which was established in 2000 by the Executive Agencies Act 30 of 1997, is responsible for the day-to-day management of trunk and regional roads network in Tanzania. Its primary function includes the maintenance and development of the road network to support the economic and social development of Tanzania. TANROADS is a semi-autonomous government Executive Agency under the Ministry of Works.

3.5.23 Energy and Water Utilities Authority (EWURA) Act (2001)

The general function of EWURA is to regulate the provision of water supply and sanitation services by a water authority or other persons. This includes the establishment of standards related to equipment and tariffs chargeable for the provision of water supply and sanitation services.

3.5.24 Antiquities Act (1964), Rules 1999

The 1964 Act, offers general protection to objects or structures, which are of archaeological, paleontological, historic, architectural, artistic, ethnological, or scientific interest. Also, the responsibilities of different actors and stakeholders of cultural heritage resources have been clarified.

The provisions of section 10(1) require that any person who, discovers a relic or monument, or any object or site which may reasonably be supposed to be a relic or monument, in Tanganyika, otherwise than in the course of a search or excavation made by a license granted under section 13, and the occupier of any land who knows of any such discovery on or under such land, shall forthwith report the same to an administrative officer, the Commissioner, the

Conservator or the Curator of the Museum. The discoverer of such a relic, monument, object or site shall take such steps as may be reasonable for the protection thereof and shall, where he makes a report concerning a portable relic or object, if so required (and on payment of the cost of delivery if any) deliver such antiquity or object to an administrative officer, the Commissioner, the Conservator or the Curator of the Museum, as the case may be. The proposed project road does not fall on any cultural heritage resources. However, the project shall ensure compliance with this Act wherever it encounters any related discoveries.

3.5.25 Urban Planning Act (2007)

This act aims to provide for the orderly and sustainable development of land in urban areas, to preserve and improve amenities, to provide for the grant of consent to develop land and powers of control over the use of land, and to provide for other related matters. This includes improving the provision of infrastructure and social services for the development of sustainable human settlements.

3.5.26 Worker's Compensation Act (2008)

This Act provides general provisions for rights for workers to compensations for occupational accidents and diseases. It includes workers' compensation funds, board of trustee and its responsibility, right of compensation and protection, claims for compensations and relevant procedures, determination of compensation including medical and rehabilitation benefits, and the roles and responsibilities of employers to ensure workers compensations and settling of disputes.

The provisions of Part I section 3 provide the objectives of this Act including Paragraph (a) to provide for adequate and equitable compensation for employees who suffer occupational injuries or contract occupational diseases arising out of and in the course of their employment and the case of death, for their dependents.

The provision of Part IV section 19 (1) requires that where an employee has an accident resulting in the employee's disablement or death, the employee or the dependents of the employee shall be subject to the provisions of this Act, be entitled to the compensation provided under this Act. Subject to section 20 that any accident during the conveyance of an employee to or from his place of employment for his employment by any means of conveyance shall be compensated. Also subject to provisions of section 22 (1) Where an employee contracts a disease and the disease has arisen out of and in the course of the employee's employment, the employee shall be compensated.

Subject to the provision of Part VI section 58 (I) how calculation for compensation shall be done shall be through calculating the earnings of an employee at the monthly rate at which the employee was being remunerated by the employer at the time immediately before the accident.

Provisions of Part VIII section 71 (1) requires that an employer carrying on business in Tanzania within the prescribed period shall register to the Director General in the prescribed form and shall submit prescribed particulars as he may require, and section (4) that failure to

do that shall be a conviction. Subject to the provision of this section 74 that employer shall be assessed by the Director-General according to a tariff of assessment calculated based on the percentage of annual earnings of the employer's employees as the Board may with due regard to the requirements of the Fund for the year of assessment deem necessary.

Provision of section 76(1) requires that where a mandator in the course of or for his business agrees with a contractor for the execution by or under the supervision of the contractor of the whole or any part of any work undertaken by the mandator, the contractor shall, in respect of the employees of the contractor employed in the execution of the work, register as an employer by the provisions of this Act and pay the necessary assessment.

The provision of section 78 requires that an employer or the relevant trade union shall notify any employee who is injured in an accident or who contracts an occupational disease of his rights and the procedures to be followed to claim compensation under this Act.

The proposed rehabilitation project shall ensure to comply with the requirements of this Act by ensuring that the contractor for project execution shall register as an employer and pay the necessary assessment fees as required by this Act. Also, throughout project execution, employees' rights as regard to compensation in case of occupational accidents or disease shall be done according to the provision.

3.6 Relevant Regulations, Strategies, and Guidelines

3.6.1 The Tanzania 2025 Development Vision/Tanzania Development Vision 2025 (2000)

The Tanzania Vision 2025 aims at achieving a high-quality livelihood for its people attaining good governance through the rule of law and developing a strong and competitive economy. Specific targets include:

1. A high-quality livelihood characterized by sustainable and shared growth (equity), and freedom from abject poverty in a democratic environment. Specifically, the Vision aims at food self-sufficiency and security, universal primary education and extension of tertiary education, gender equality, universal access to primary health care, 75% reduction in infant and maternal mortality rates, universal access to safe water, increased life expectancy, and absence of abject poverty, a well-educated and learning society.
2. Good governance and the rule of law moral and cultural uprightness, adherence to the rule of law, elimination of corruption.
3. A strong and competitive economy capable of producing sustainable growth and shared benefits a diversified and semi-industrialized economy, macro-economic stability, a growth rate of 8% per annum, adequate level of physical infrastructure, an active and competitive player in regional and global markets.

Good roads are one of the most important agents to enable Tanzania to achieve its Development Vision objectives (both social and economic), such as eradicating poverty,

attaining food security, sustaining biodiversity and sensitive ecosystems. Improvement of Road Sections through this project contributes to the attainment of the 2025 Vision.

3.6.2 The Explosives Regulations of 1964, GN 56/64

The Explosives Regulations of 1964, GN 56/64, establish conditions for licensing stores, magazines, and general precautions for explosives. They also stipulate the nature of work that is permissible when blasting and the requirement that storage places for explosives be at a certain distance from other buildings. A condition on all of the licenses is that the explosives must be stored in a licensed magazine or store or approved storage boxes. The contactor for this project shall apply for a license before the use of explosives for blasting.

3.6.3 Land (Assessment of the Value of Land for Compensation) Regulations, 2001

These regulations provide criteria for the assessment of compensation on land, as per market value for real property; disturbance allowance is calculated as a percentage of the market value of the acquired assets over twelve months, and transport allowance calculated at the cost of 12 tons hauled over a distance not exceeding 20 km.

The other criteria include loss of profit on accommodation based on business audited accounts and accommodation allowance equivalent to the rent of the acquired property per month over 36 months. These regulations shall guide the compensation exercise in this project.

3.6.4 Mining (Environmental management and Protection) Regulations, 1999

These regulations apart from other things give the Minister responsible for mining the mandate to exempt or ask for environmental information during application for a mining license. Section (4) of this regulation states that "*Except in cases where an exemption has been to require EIA granted under section 64 (2) of the Act, an environmental impact statement and environmental management plan must accompany applications for Mineral Rights in all special mining license applications"*. These regulations require the contractor to apply for a mining license for new borrow pits/quarry sites. The application should be accompanied by EIA. For this road, the existing borrow pits shall be used.

3.6.5 Environmental Impact Assessment and Auditing Regulations (2005)

These regulations set procedures for conducting EIA and environmental audits in the country. The regulations also require the registration of EIA experts. This EIA has been conducted following the above-stated regulations.

3.6.6 National Strategy for Growth and Reduction of Poverty (NSGRP-MKUKUTA-2010)

One of NSGRP's objectives is to improve the quality of life and social wellbeing. This can be achieved through improving passable (good/fair condition) rural roads from 50% in 2003 to at least 75% in 2010. The strategy shall also ensure that the health facilities are improved and accessible and drugs are made available throughout the year (NSGRP, 2003). The proposed

road sections under DIST improvement shall contribute to poverty reduction within the project area.

3.6.7 Environmental Assessment and Management Guidelines for the Road Sector (2011)

The Environmental Assessment and Management Guidelines for the Road Sector (EAMGRS) were developed in December 2004 (Signed in 2011), just after EMA (2004) was enacted. The guidelines give procedures for the EIA process as briefly explained in Table 3.2.

Table 3.2: Developed EIA Procedures in the Road Sector

EIA PROCEDURES IN THE ROAD SECTOR (as per EAMGRS 2011)
Administrative Procedures: EIA administrative procedures vary based on the significance of the environmental impacts. The Minister for Environment is responsible for projects with potential major environmental impacts. The EIA of projects with potential non-major environmental impacts is carried out under the Ministry responsible for the road sector and the Road Sector-Environmental Section (RS-ES). **Environment Application and Screening Process:** EA procedures in the road sector are initiated when the Road Implementing Agency (RIA) submits an Environment Application Form to the RS-ES during the Project Identification or Project Planning/Feasibility Study Phase. Environmental screening of the proposed project shall determine whether the project shall require: An Initial Environmental Examination (IEE); a Limited Environmental Analysis (LEA); or a detailed Environmental Impact Assessment (EIA). Environmental Screening is done based on the information presented in the Environmental Application Form. The RS-ES is responsible for screening projects and this may acquire a reconnaissance study by an environmental specialist, especially if the project traverses' sensitive areas or when there is potential for complex environmental issues. All road projects with non-major environmental impacts shall be subject to an Initial Environmental Examination (lEE) or a Limited Environmental Analysis (LEA). Projects with major environmental impacts are subject to EIA. The RS-ES shall register non-major-impact-projects. For major impact projects, the registration is done by NEMC.

3.6.8 Environmental Management (Air Quality Standards) Regulations, 2007

The objectives of these regulations are to set baseline parameters on air quality and emissions and enforce minimum air quality standards. They are also meant to help developers including industrialists to keep abreast with environmentally friendly technologies and ensure that public health, as well as the environment, is protected from various air pollution emissions sources. These Regulations stipulate the role and powers of the National Environmental Standards Committee. According to the regulations, the approval of a permit for emission of air pollutants shall be guided by ambient, receptor, emission, and specification standards approved by the Minister. Offenses and penalties for contraveners are also provided for in the regulations.

Emission limits of Sulphur and nitrogen dioxides, carbon monoxide, lead, ozone, black smoke, and suspended particulate matter together with their test methods are specified. Tolerance limits and test methods for dust, Sulphur dioxide, and nitrogen oxides from cement factories into the air as well as from motor vehicles are also given. TANROADS shall monitor the air quality from the project area with guidance from this law.

3.6.9 The Environmental Management (Water Quality Standards) Regulations, 2007

Among others, the object of the regulations is to enforce minimum water quality standards prescribed by the National Environmental Standards Committee, enable the National Environmental Standards Committee to determine water usages for purposes of establishing environmental quality standards and values for each user, and ensure all discharges of pollutants take into considerations the ability of the receiving water to accommodate contaminants for protection of human health and conservation of marine and aquatic environments. The Regulations elucidate the role of the National Environmental Standards Committee of the Tanzania Bureau of Standards in setting minimum quality standards for water, sewerage, etc. They also give prohibitions and prescribed minimum water quality standards. The applicant of a water right is obliged to indicate the likely impact on the environment and comply with prescribed effluent or receiving water standards, which are not below the standards specified in these regulations if the water right or permit is granted.

The regulations give NEMC the power to designate main water polluting activities for which a prior grant of the permit must be obtained from the Council. It can be observed from the regulations that, the NEMC plays a crucial role in water quality compliance and enforcement. Recording and reporting requirements, Offences, and penalties for non-compliance as well as how appeals against aggrieved decisions should be handled are stipulated. TANROADS shall monitor the water quality from the water bodies at the project area with guidance from this law.

3.6.10 Solid waste Management Regulation (2009)

The regulation has been made under sections 114, 115, 116, 117, 118, 119, 120, 121, 122, and 230 of the Environmental Management Act, 2004. These regulations apply to all matters of solid waste management. They aimed among other things at setting the standard for a permit to dispose of solid waste and license to own or operate solid waste disposal site. These regulations shall guide all the collection and disposal of solid waste from the project area.

3.6.11 Environmental Management Act (Hazardous Waste Control), 2009

These regulations have been made under sections 110(4) and (5), 128, 133 (4), 135, and 130 of the Environmental Management Act, 2004. These regulations apply to all categories of hazardous waste and to generate, storage, disposal, and their movement into and out of mainland Tanzania. These regulations require that any person dealing with hazardous waste in Tanzania be guided by the following principles of environmental and sustainable development:

- The precautionary principle
- Polluter pays principle, and
- The producer extended responsibility

Road Construction is not associated with the production of hazardous wastes. However, if hazardous wastes are produced TANROADS shall take stock of this regulation in handling them.

3.6.12 The Environmental Regulations 2014 (Standards for control of noise and Vibrations)

Under these regulations NEMC is mandated, in consultation with the TBS, to establish criteria and procedures for the measurement of noise and vibration pollution; minimum standards for the emission of noise and vibration pollution into the environment, and guidelines for the abatement of unreasonable noise and vibration pollution emitted into the environment from any source. The Regulations provide detailed noise standards according to this provision. The purpose of these Regulations is to ensure the maintenance of a healthy environment for all people in Tanzania, the tranquility of their surroundings and their psychological well-being by regulating noise levels, and generally, to elevate the standard of living of the people by prescribing the maximum permissible noise levels from a facility or activity to which a person may be exposed; providing for the control of noise and for mitigating measures for the reduction of noise.

The permissible limits are provided for in the Schedule to the Regulations. Construction of the abattoir and production activities shall produce too much noise and vibrations owing to the use of heavy machinery.

3.6.13 Environmental Code of Practice for Road Works 2009

Under this code of practice, the construction site's temporary installations must be adequately located to avoid or minimize environmental disturbance. Use previously cleared or disturbed areas to the extent possible or sites that shall need to be cleared in the future for other purposes. The Contractor must observe the following conditions:

- The construction site's access paths, storage, and parking facilities, workers' camps, site offices, and other temporary installations must be located at least 60 m from permanent watercourses (including irrigation and drainage canals) or lakes and more than 30 m from intermittent watercourses.
- Workers' camps must be located at least 150 m from the road reserve of the main road to reduce the harmful effects of noise and more than 500 m from inhabited zones.
- Sites of exceptional interest (e.g., ecological or archaeological) must be avoided.
- The workers' camp must be located at least 10 km from classified forests to avoid the illegal harvest of wood for domestic purposes.
- The operation of the construction campsite must not lead to conflicts with the local population over the use of local resources for domestic purposes.

3.7 Institutional Framework

TANROADS is the main project implementing entity with overall responsibility for project execution. TANROADS shall establish a Project implementation Team (PIT) which shall include dedicated E&S capacity. To ensure adequate preparation, monitoring, and supervision of the implementation of the E&S risk management instruments under this project, the Environmental and Social Commitment Plan requires that: TANROADS hires or fully dedicates qualified staff/consultants (with expertise in environmental, OHS, GBV, resettlement, labor, stakeholder engagement, and GRM) to assist in project E&S

management; TANROADS' construction supervision consultants have highly qualified E&S staff; TANROADS hire consultants to conduct adequate E&S audits for subproject; and have in place, a robust capacity building program be put in place as early as possible in project implementation. These have been incorporated in the project design.

3.7.1 Summary of institutions and their responsibilities

i. Overall Management Responsibility

The institutional arrangement for environmental management in Tanzania is well spelt out in the EMA (2004). There are seven (7) institutions mentioned by the act, of which the Minister Responsible for the Environment is the overall in-charge for administration of all matters relating to the environment.

Part III, Section 13(1) of EMA (2004) states that the Minister responsible for environment shall be in overall in -charge of all matters relating to the environment and shall in that respect be responsible for articulation of policy guidelines necessary for the promotion, protection and sustainable management of environment in Tanzania.

The legal institutions for environmental management in the country include:

- Vice President's Office - Minister responsible for Environment
- National Environnent Management Council (NEMC);
- Local Government Authorities

ii. Summary of institutions and their responsibilities

The outline of the responsibilities of different institutions and personnel at national and local levels in implantation of the Environmental Management and Monitoring Plans for the road project is presented in the next table.

Table 3.3: Relevant Institutions to the project

Authority Level	Institution and personnel designation	Responsibilities
National level	Chief Executive Officer - TANROADS	• To ensure that the proposed road is designed in accordance with existing national legislation, policies, guidelines and regulation • To coordinate and facilitate EIA study and resettlement issues for project affected people (PAPs) • To ensure that Contractors are implementing the proposed road project in compliance to ESMP for the project and the conditions of EIA Certificate • To ensure that the environmental monitoring and internal auditing are carried out regularly.
	Permanent Secretary - Ministry of Works (Safety and Environment Division).	• To issue guidance on development and management of Infrastructures in the country • To advise on and, in collaboration with other bodies prepare and review the policies of the Government on the protection and management of the environment. • To ensure compliance by the Ministry with the requirement of Environmental Management Act 2004. • To coordinate all activities related to the environment in implementation of road project • To develop and review the environmental standard, for road sector • To oversee the preparation an implementation of an Environmental Impact Assessment for investments in the infrastructure development sector including development and maintenance projects. • To undertake the analysis of Environmental Impact of the sector legislations, regulations, policies, plans strategies and programs through strategic environmental assessment.
	Chief Government Valuer - the Ministry of Lands and Human Settlement	• To review and approve the Resettlement Action Plan and Property Valuation Report for compensation of affected properties. • To survey and allocate new plots to the project affected people and other required sites for the project facilities
	Minister responsible for Environment -	• Responsible for matters relating to environment, and articulation of policy

Authority Level	Institution and personnel designation	Responsibilities
	Director of Environment	guidelines necessary for the promotion, and sustainable management of environment in Tanzania • Advise the Government on legislative and other measures for the management of the environment or the implementation of the relevant international agreements in the field of environment
	Director General - the National Environment Management Council (NEMC)	• To review the EIA reports • To recommend for project approval to the Minister of Environment and issuance of EIA Certificates • To ensure EMA Act, 2004 enforcement and compliance by development projects • To monitor project environmental compliance
Regional and District/ Municipal level	Treasurer for Ministry of Finance	• To allocate funds for Resettlement /Compensation
Local Government Authorities (Township, Ward, "Mtaa")	Local Leaders and general public of Wards and villages located along the project road sections.	• To oversee general development plans and project support to the Ward and Villages. • To assist in recruitment of project construction workers to be obtained from the village • To assist in project monitoring as watchdog for the environment, ensure well-being of residents and participate in project activities • To ensure a workable environment for the contractor by providing reliable support and security to the Contractor • To participate in HIV/AIDS awareness campaigns to be conducted by the project • To provide link between the project developer and the community by providing information on local social, economic, environmental situation • To view socio-economic and cultural value of the sites and on the proposed road operations. • To render any required assistance and advice on the implementation of the project

Authority Level	Institution and personnel designation	Responsibilities
		• Ensure enforcement of the Environmental Management Act in their respective areas, • Advise the Environmental Management Committees on all environmental matters • Promote awareness in their areas on the protection of the environment and conservation of natural resources.
Local Government Authorities (Township, Ward, Village, "Mtaa", "	Local Leaders and general public of Wards and villages located along the project road sections	• To assist in project monitoring as watchdog for the environment, ensure well-being of residents and participate in project activities • To ensure a workable environment for the contractor by providing reliable support and security to the Contractor • To participate in HIV/AIDS awareness campaigns to be conducted by the project • To provide link between the project developer and the community by providing information on local social, economic, environmental situation • To view socio-economic and cultural value of the sites and on the proposed road operations. • To render any required assistance and advice on the implementation of the project • Ensure enforcement of the Environmental Management Act in their respective areas, • Advise the Environmental Management Committees on all environmental matters • Promote awareness in their areas on the protection of the environment and conservation of natural resources.

3.7.2 Required Permits

Prior to the start of the construction works, it is necessary to obtain a number of authorizations and permits from local and central government authorities of Tanzania. These permits, are those related to environmental issues, water abstraction, relocation of public utilities, resettlement and mining. These permits and authorizations are summarized in the following table 3.4 below including a description of the permits/authorization and the government authority responsible for issuance.

Table 3.4: Summary Permits required

SNº.	Permit/Authorization	Issuing Authority	Purpose
01.	EIA Certificate	NEMC/VPO	Approval of project Implementation.
02.	Resettlement Valuation Report	Chief Government Valuer-CGV	To allow compensation and resettlement procedures.
03.	TTCL Infrastructure Relocation Approval	TTCL-Regional Office	To allow relocation of utility in order construct the proposed road.
04.	TANESCO Infrastructure Relocation Approval	TANESCO Regional Office	To allow relocation of electricity utility infrastructure in order construct the proposed road.
05.	Urban water Authorities Infrastructure Relocation Approval	DUWASA and MRUWASA-Regional Office	To allow relocation of water utility infrastructure in order construct the proposed road.
06.	Water Use and Discharge Permit	Wami Water Basin	To allow abstraction of water from Ruvuma river basin for project construction.
07.	Mining Permit	Central Zonal Mining Office	To allow extraction of construction minerals from quarry sites and borrow pits for project construction.

4.0 ENVIRONMENTAL AND SOCIAL BASELINE CONDITIONS

4.1 Overview

The baseline study was conducted so as to establish a benchmark for the environmental and socio-economic condition of the project before the project's implementation to determine change at the intervention during the project execution and being able to establish and identify social economic and environmental impacts that will result from the change of the project development during and after the construction phase. Project socio-economic and environmental impacts are anticipated to affect a greater geographical area. The baseline study area for the socio-cultural-economic study corresponds to the extent of the communities in which the proposed subprojects will be located.

The proposed project's environmental baseline study was conducted on December 2024. The baseline study was done in areas of the direct and indirect zone of influence of the proposed subprojects. Gathering of baseline data was done to meet the following objectives:

- To understand key biological, physical, ecological, social, cultural, economic, and political conditions in areas potentially affected by the proposed project
- To understand the expectations and concerns of a range of stakeholders on the proposed development
- To inform the development of mitigation measures
- To benchmark future socio-economic changes/impacts and assess the effectiveness of mitigation measures.

4.1.1 Delineation of Study Areas

Two Study areas are defined in this ESIA:

- **The Extended study area**: which cover the two districts. The Extended Study Area is delineated based on possible indirect impacts (both positive and negative).
- **The Limited study area**, which covers the road and off-site facilities (such as quarries, borrow areas, contractor's campsite). This area is where impacts and risks are more likely to be felt on immediate environmental and social receptors. Its delineation includes a 500 meters zone on both side of the road. The rationale for the selection of this width is arbitrary but it will allow to consider impacts from construction work nuisances such as noise, air pollution and dust and displacement of private assets. It includes the road Right-of Way (RoW).

In this ESIA, in addition to the Study areas, several terms are also used to spatially describe project components, baseline project setting, impacts or mitigations:

- **Chainage:** which a measurement of distances along the road and allows to localize components and impacts.
- **RoW:** which is the space occupied by the road reserve.
- **Project Site:** Project Site means the land and spaces, including the Project RoW and any temporary construction easements that are necessary for construction of the Project.

4.1.2 Methodologies for Environmental and Social- Economic Data Collection for the Project Area

(i) Approach and Methodology

In order to properly address the environmental and social economic issues along the road project, a safeguards team participated in ESIA Study on December 2024. The study team conducted desk review, site verification, and public consultation and finally updated the Environmental and Social Impact Assessment (ESIA) to ensure that social- economic aspects along the road has been included in the ESIA report and analyzed as per requirements of the WB-ESSs accordingly.

Field activities were preceded by visits of the SIA team to all villages for introductions, briefings on project preparation, and public consultation meetings and household questionnaires administered in each village. The leaders (VEO and Chairman) of each village were consulted to confirm the timing and venue of public meetings. The SIA team used this as an opportunity to collect secondary data from each village using a dedicated form designed for that purpose.

Public consultation meetings were conducted in all townships, centers, along the project road. During the meetings, key concerns, issues, and suggestions were recorded from community members. Questions related to the proposed project were raised and responses provided. Minutes of the meetings were recorded, lists of attendance taken and stamped by village authorities, and data collected for use in the review and updating of this Report.

Stakeholder consultation and engagement are a continuous process for DIST and further consultations will be conducted by the Contractor, Supervising Engineer, and PIT safeguard experts during project undertaking.

(ii) Source and Methodologies for data collection

- **Primary Sources:** Result of the field and laboratory data collected and analyzed directly.
- **Secondary Sources:** Data collected indirectly from published records or documents such as project documents, village profiles, maps, photos, internet sources.

The modes of consultation applied during the survey included:

- One-on-one interviews with selected informants, (e.g., DC, DED, TD, MD. Planners, Education Officers, Livestock Development Officers, Agricultural Extension Officers, Community Development Officers, Water Engineers and District Engineers); and
- Meetings with Local Government Authorities and villagers along the road.

The agenda for these consultations included the following:

- Presentation of the Project;
- Presentation of the proposed road (using maps);
- Definition of the Regional/District institutional framework;

- Discussion of previous experience along the road corridor with respect to compensation eligibility criteria and entitlement packages;
- Obtaining from authorities their socio-economic concerns and perceptions regarding the proposed road; and
- Discussion of the role of authorities in public information dissemination, monitoring and management plan.

(iii) Environmental and Social-Economic impact assessment methodology

A comprehensive desk review, site verification (Transect Walk) and stakeholder's consultation on the environmental and social-economic aspects were carried to meet the requirements of WB-ESSs and the EIA Regulation, guidelines and the TOR. The Team reviewed all relevant documents, specifically those related to the districts environmental and social-economic survey, and in particular to communities along the road by analyzing their potentials and impacts related to the proposed road project. However, to streamline the data collection, Secondary data were adopted by focusing on the environmental and socio-economic situation of the potentially affected population along the road project. The methodology used for environmental and social-economic data collection and analysis includes the following.

(a) Documentary

Terms of Reference were studied carefully together with other relevant documents and reports to clearly understand and eventually work on the assignment as stipulated in the ToR and World Bank ESF requirement.

(b) Courtesy Call and officials Consultations

This included official meetings to identified stakeholder's, as well as share programme and tentative schedule for public consultations with regional, districts and ward officials and tentative schedule for conducting public consultation meetings, focus group discussion and interview for project affected villages along the road project.

(c) Household Interviews

The enumerators conducted household interviews with approximately more than 535 household heads, during two levels of consultation rounds for collection of environmental and social-economic data for updating the ESIA between 2023 to 2024, to collect quantitative and qualitative data on relevant issues in the project area such as environmental aspects, economic status, gender aspects, education levels, health status, vulnerable group and etc. A total of 229 males and 306 females in townships, villages and centers affected by the road project were interviewed in these exercises via tailored questionnaires. The lists and names of the consulted stakeholders are found on **Appendix.**

(d) Public Consultations

Public consultations were done to communities along the road, special groups and stakeholders along the road, householders, PAPs). Among them, are persons that will be physically and/or economically displaced. The result from ESIA revealed that all PAPs who will be affected by the road project shall be compensated and relocated out of the RoW prior project execution.

(iv) First Round Stakeholders' Engagement Methodology

The stakeholder identification and consultation were done at national, regional and local levels. These included the government agencies, local NGOs, affected groups and other interested parties. The identified stakeholders were categorized into primary and secondary stakeholders, and whether they are directly or indirectly affected by the project or interested parties to the project. The stakeholder identification also focused on their location, their importance to the project, issues that are critical to them and how are they were involved in the ESIA study. During this process, particular attention was paid on the disadvantaged groups that are likely to be affected by the project, such as children, the elderly and women.

The identified stakeholders can be categorized into primary and secondary stakeholders. The primary stakeholders are mainly the local communities who can be directly or indirectly affected positively or negatively by the project. These include the project affected persons (PAPs) and the rest of the local community members in the project area. The secondary stakeholders are those institutions that have interest on the project but can be indirectly affected positively or negatively. The stakeholder's identification and analysis matrix are provided Table 5.1 of chapter 5.0 of the report.

4.1.3 Project Area of Influence

The Area of Influence includes the Project site (the land to be used for the proposed road/construction corridor shall be 60m. The proposed road is potentially likely to affect alongside communities who will be found by any extension of road corridor; hence the compensation and relocation shall be implemented. Other areas to be affected by the road project includes sites identified as sources of construction materials, transportation route to sites (i.e. borrow pits and quarry sites).

The area of influence for this project are defined as:

The area likely to be affected include:

(i) The project's activities and facilities that are directly owned, operated or managed (including by contractors) and that are a component of the project;

(ii) Impacts from unplanned but predictable developments caused by the project that may occur later or at different location/s; or

(iii) Indirect project impacts on biodiversity or on ecosystem services upon which Affected Communities' livelihoods are dependent.

- Associated facilities, which are facilities that are not part of the project and that would not have been constructed or expanded if the project did not exist and without which the project would not be viable.
- Cumulative impacts that result from the incremental impact, on areas or resources used or directly impacted by the project, from other existing, planned or reasonably defined developments at the time the risks and impacts identification process is conducted.

(i) Direct Area of Influence or Primary Corridor of Impacts

In the context of this report, the Direct Area of Influence includes the proposed road footprint as well as the receiving environment surrounding the road likely to be affected by the Project activities during construction, operation, and demobilization phases within a radius of 60m. The site of the construction shall be 60m RoW, and the area immediately bordering it. The road carriageway width will range from 15m to 30m to accommodate dual carriageway, the width encompasses shoulders, drainage, median at the canter of dual carriageway, and drainage on either side of the road. The areas from 0 to 250m each side of the road per project design. This also includes areas that will be impacted by the construction of the road, health and safety impacts (including disturbance from noise and dust during construction), and construction campsite and in-migration of job opportunists into the local area.

(ii) Indirect Area of Influence or Secondary Impact area.

The Indirect Area of Influence includes areas within a wider radius from *(250m to 500m)* from the road centerline to each side of the road, which may be affected by the Project although to a lesser extent.

These areas shall be located across/within *mitaas* traversed by the project road within 60m RoW. ***(Refers as project Secondary Impact zone ranging from 250m to 500m)***. These are off-site locations linked to the road construction works including i.e. borrow areas, quarries, and other sources of materials such as sand, gravel, aggregates, fill materials, campsites, water, etc. Involving civil works/extraction activities done by/or on behalf of the project. Other sites shall be waste disposal sites, campsites (if so requires), or other locations were chosen for the accommodation of crew and equipment and material storage.

The baseline data collection and survey analysis revered that, the impacts on the loss of biodiversity will be of minimum significant as there is no evidence of terrestrial and aquatic biodiversity of conservation status as per IBAT and IUCN Red list requirements within the ***(Primary and secondary Impacts zones)*** hence, the Biodiversity Management Plan is not anticipated under this project as per ESS-6. However, the road project shall be implemented with precautions of reducing minimum clearance of vegetation along the road (Construction works shall be confined within existing Corridor of impact of 45m Row) and the remaining section of 32.1km shall be within 60m RoW as well as to those sources of construction materials as per design.

(iii) The general project area of Influence.

This includes the wider geographical areas that are influenced by this project ie Dodoma City Council, this area goes beyond 500m radius from the road project. ***(Refers to general project area of Influence).***

4.2 Physical Environment

4.2.1 Topography

Dodoma City stands on the abroad upland plateau with an altitude ranging from 1050 to 1468m above sea level. The topography of Dodoma City is generally flat or rolling terrain. At the city center of Dodoma City, the elevation gradually inclines from the south to the north. The soil in Dodoma is considered to be of relatively low fertility, deficient in organic matter,

moderate to poor permeability with shallow soil depth. The soils are sandy clay, sandy loam, and clay which are reddish-brown or dark loam.

4.2.2 Climate

4.2.2.1 Temperature

The average temperature in Dodoma is 22.6^{O}C. Generally, Dodoma experiences both high and low temperature. The highest recorded temperature is 31.7^{O}C while the lowest temperature is 12.7^{O}C.

November is the hottest month of the year with an average temperature of about 24.7 °C. July is the coldest month of the year with an average temperature of about 19.6 °C. During the year, the average temperatures vary by 5.1 °C.

4.2.2.2 Precipitation

Dodoma is a semiarid area, characterized by a marked seasonal rainfall distribution with a long dry season starting from late April to late November and a short-wet season starting late November to the end of April. Average rainfall ranges from 550mm to 600mm per annum.
The monthly precipitation is lowest in June, with an average of 0 mm. The most precipitation falls in January, with an average of about 129 mm. The difference in precipitation between the driest and wettest months is 129 mm.

4.2.2.3 Humidity

The average annual percentage of humidity is about 60%, whereby the most humid month is February and the least humid month is October. Error! Reference source not found.**1** shows the mean monthly relative humidity over the year in Dodoma City.

In terms of comfortability the project area experiences *significant* seasonal variation in the perceived humidity. Error! Reference source not found. shows the humidity comfort levels in Dodoma City. The *muggier period* of the year lasts for *4.9 months*, from *November 28* to *April 24*, during which time the comfort level is *muggy*, *oppressive*, or *miserable* at least *8%* of the time. The *muggiest day* of the year is *March 12*, with muggy conditions *32%* of the time. The *least muggy* day of the year is *August 3*, when muggy conditions are essentially unheard of.

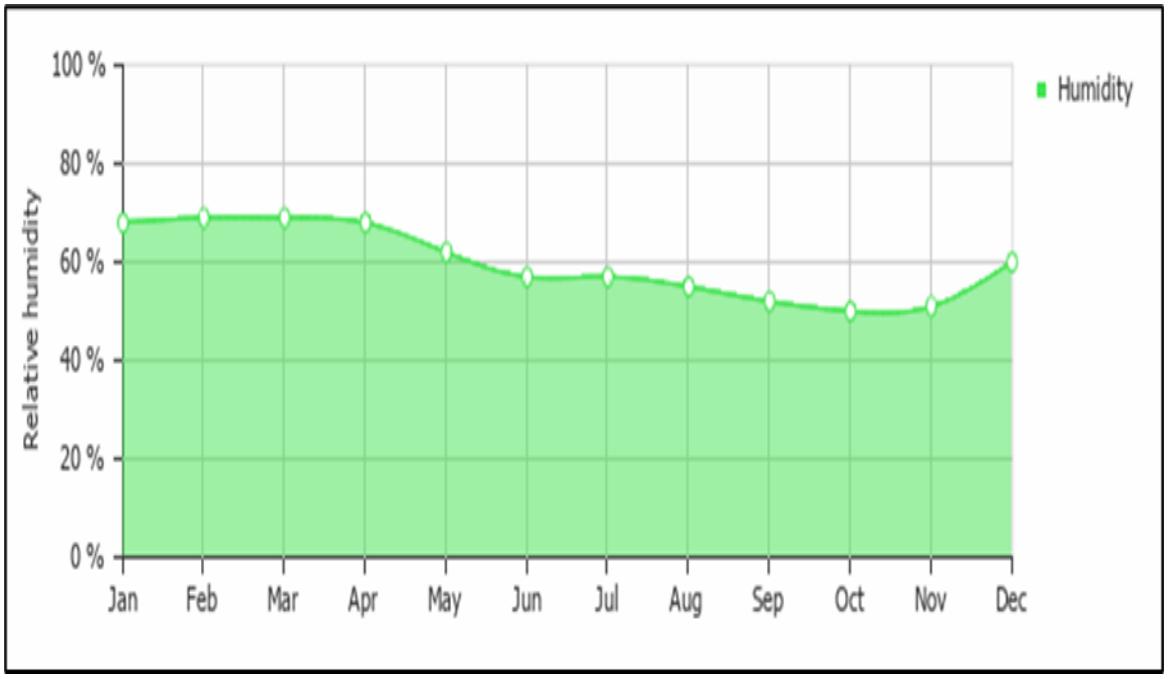

Figure 4.1: Average Monthly Humidity in Dodoma City.
Source:https://weather-and-climate.com/average-monthly-Humidity-perc, Dodoma, Tanzania

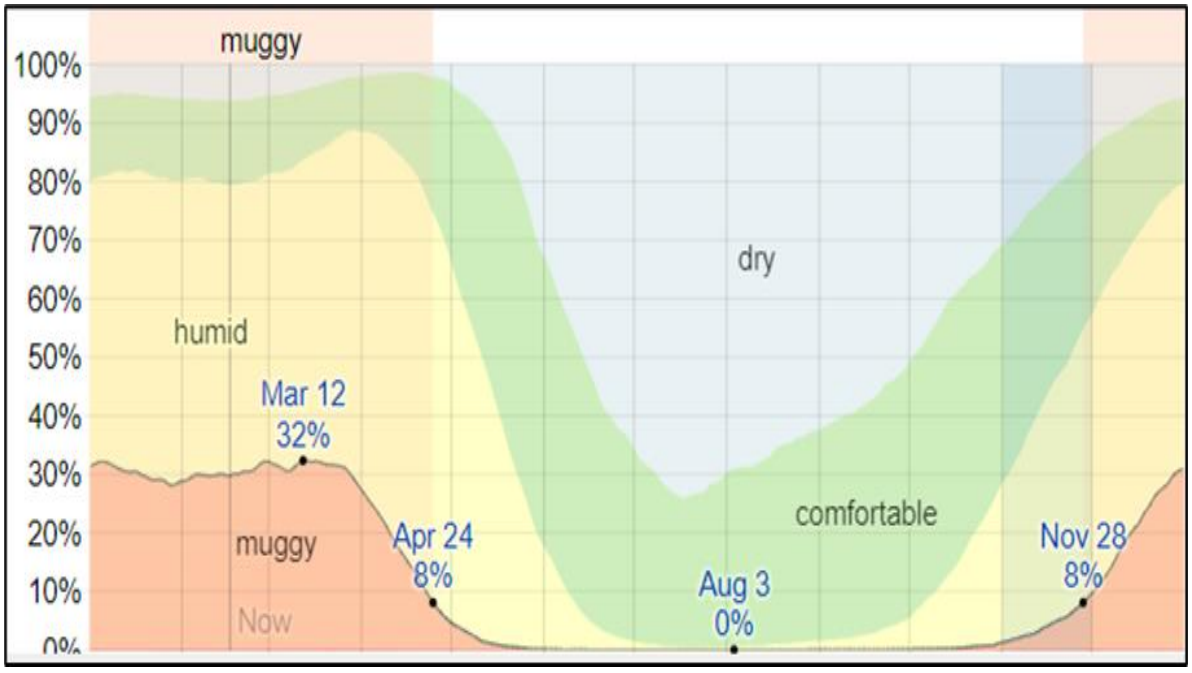

Figure 4.2: Humidity Comfort Levels in Dodoma City.
Source: https://weatherspark.com/y/98687/Average-Weather-in-Dodoma-Tanzania-Year-Round

4.2.2.4 Wind Speed and Direction

(a) Wind Speed

The average hourly wind speed in Dodoma experiences *significant* seasonal variation over the course of the year. Error! Reference source not found.**3** shows the average wind speed in

Dodoma City. The *windier* part of the year lasts for *7.1 months*, from *May 3* to *December 6*, with average wind speeds of more than *10.0 miles per hour*. The *windiest* day of the year is *October 12*, with an average hourly wind speed of *13.6 miles per hour*.
The *calmer* time of year lasts for *4.9 months*, from *December 6* to *May 3*. The *calmest* day of the year is *February 12*, with an average hourly wind speed of *6.4 miles per hour*.

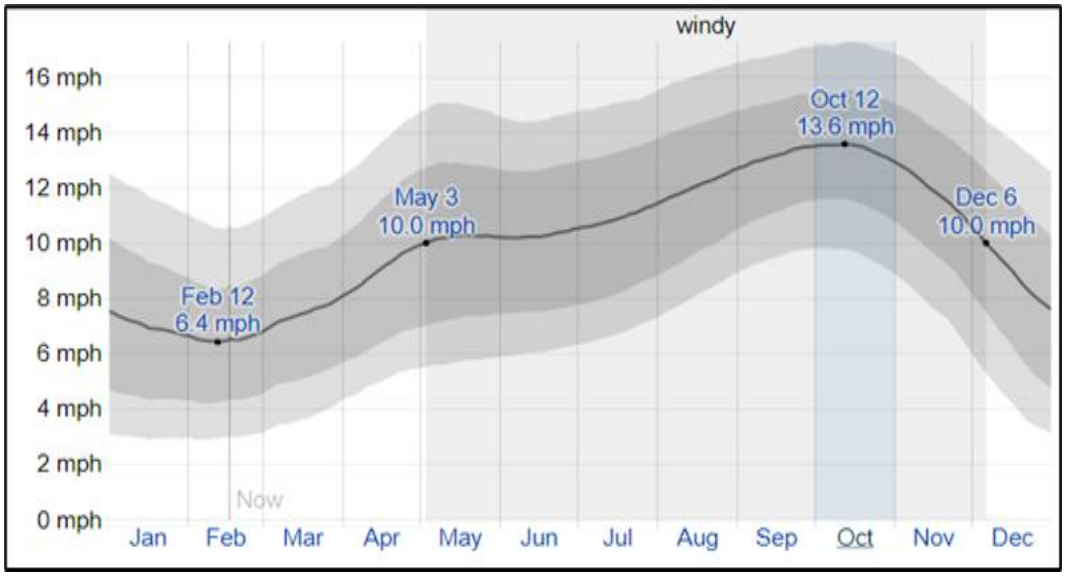

Figure 4.3: Average Wind Speed in Dodoma City.
Sources: https://weatherspark.com/y/98687/Average-Weather-in-Dodoma-Tanzania-Year-Round

(b) Wind Direction

The predominant average hourly wind direction in Dodoma is from the *east* throughout the year. Error! Reference source not found.**4** shows the average hourly wind direction in Dodoma City. The percentage of hours in which the mean wind direction is from each of the four cardinal wind directions, excluding hours in which the mean wind speed is less than *1.0 mph*. The lightly tinted areas at the boundaries are the percentage of hours spent in the implied intermediate directions (northeast, southeast, southwest, and northwest).

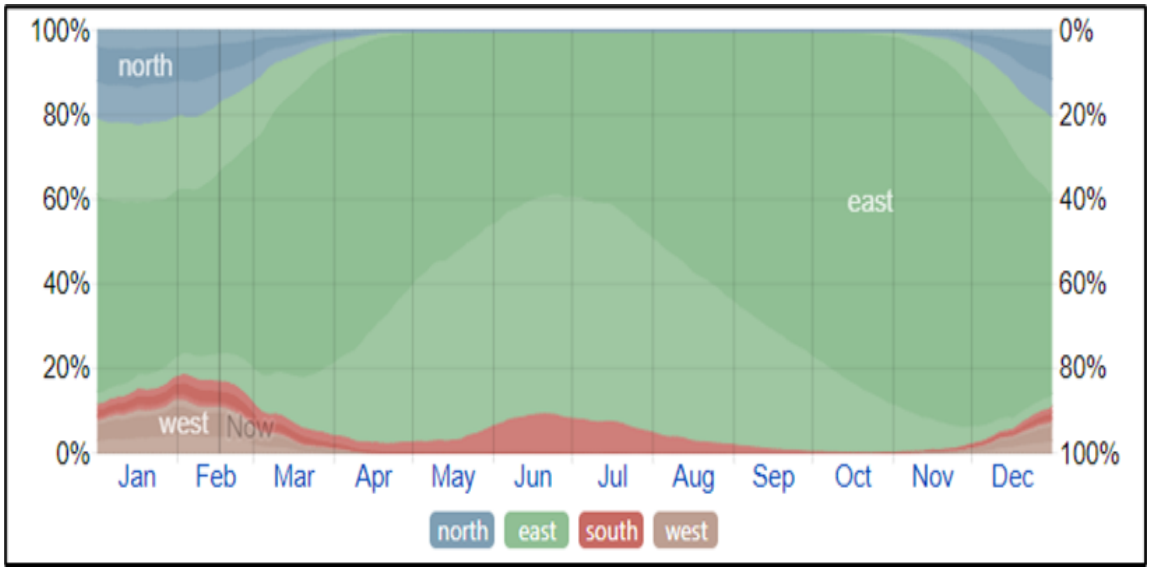

Figure 4.4: Average Hourly Wind Direction in Dodoma City.

Source: *https://weatherspark.com/y/98687/Average-Weather-in-Dodoma-Tanzania-Year-Round*

4.2.3 Air Quality

Baseline air quality conditions within the Dodoma Radial Roads project area were established during the ESIA study through field measurements conducted at selected locations within Dodoma City and its immediate surroundings. The monitoring aimed at establishing pre-construction ambient air quality conditions along major radial corridors connecting the Central Business District (CBD), residential areas, airport, and key transport nodes.

Air quality monitoring focused on pollutants typically associated with road traffic and urban activities, including particulate matter ($PM_{2.5}$ and PM_{10}), Carbon Monoxide (CO), Nitrogen Dioxide (NO_2), Sulphur Dioxide (SO_2), Total Volatile Organic Compounds (TVOCs), Carbon Dioxide (CO_2), and Hydrogen Sulphide (H_2S). Sampling locations were selected based on traffic intensity, proximity to sensitive receptors, and relevance to the proposed project roads such as Image Roundabout, Dodoma CBD junctions, Airport corridor, Ihumwa, and peri-urban areas.

Monitoring was conducted in accordance with ISO Code of Practice (1996) and equipment manufacturers' procedures. Wind speed and direction were also measured to assess dispersion characteristics of dust and gaseous pollutants within the project influence area.

The measured baseline PM_{10} concentrations within the Dodoma project area ranged from 11 µg/m³ to 299 µg/m³, while $PM_{2.5}$ concentrations ranged from 10 µg/m³ to 53 µg/m³. Higher particulate matter concentrations were recorded at locations with high traffic activity and ongoing works, notably Dodoma Junction, Bridge Construction Area, and Nanenane, while relatively lower concentrations were observed in less congested areas such as Manchali and Ngiloli.

Measured concentrations of gaseous pollutants (CO, NO_2, SO_2, H_2S, and TVOCs) recorded zero readings at the monitoring stations, indicating that their concentrations were below the detection limits of the equipment and well within applicable national (TBS/NES) and WHO/IFC guideline values.

Overall, baseline air quality within the Dodoma Radial Roads project area is generally acceptable, with localized elevations of particulate matter attributed to traffic movement and exposed surfaces. Potential air quality impacts during construction are expected to be localized and temporary and will be managed through implementation of dust control and traffic management measures provided in the ESMP.

Table 4.1: Baseline Air Quality Results

Sample ID	Location (Dodoma Project Area)	$PM_{2.5}$ (µg/m³)	PM_{10} (µg/m³)	CO_2 (ppm)	CO, NO_2, SO_2, H_2S, TVOC (mg/m³)	Wind Speed (m/s)
SP12	Kibaigwa (Kongwa – Dodoma Region)	29	40	419	0.00	4.0
SP16	Dodoma Junction (CBD Area)	12	15	386	0.00	3.1
SP17	Near Dodoma Airport	15	20	410	0.00	3.9
SP18	Bridge Construction Area (Dodoma)	53	299	428	0.00	3.0
SP19	Nanenane Area	10	11	415	0.00	4.2
SP20	Ihumwa	18	27	419	0.00	3.3
SP21	Manchali	13	15	424	0.00	2.2
SP22	Ngiloli	16	17	422	0.00	3.4
SP23	Kiegeya Bridge (Dodoma)	13	30	455	0.00	3.2

Source: ESIA Field Measurements, 2024
Applicable Standards: TBS/NES & WHO/IFC Guidelines
($PM_{2.5}$: 25 µg/m³; PM_{10}: 50 µg/m³ – 24-hour average)

4.2.4 Hydrology and Drainage

The project area is generally drained by streams and small tributaries which flow downstream from Ntyuka Mountains to join seasonal streams in Dodoma town area and finally empty its water to Kikuyu Stream, which crosses the Dodoma-Dar Es Salaam Road at Emaus.

The surrounding watershed areas, which lie between 1460 m above sea level and 1120 m above sea level, drain towards the project area. During rainy seasons some of the road sections become flooded or water logged due to lack of road side drainages.

4.2.5 Geology and Soils

4.2.5.1 Geology

Geologically, the Dodoma City lies in the fractured and sheared, crystalline basement rock of Dodoma craton, which is comprised of granite, granulite, and migmatite intruded by dolerite / diorite and pegmatite dykes. There is also a narrow belt of metasedimentary rocks (Hombolo-Mela Mela) comprised of ferruginous quartzites, ironstones, micaceous quartzites, quartz, feldspathic schists (Shindo 1991; Nkotagu 1996a).

4.2.5.2 Soils

The soils of the project area are characterized by a variety of textures, ranging from coarse sands to heavy clays. In general, most soils of the area have a low nutrient status and very low organic matter contents.

Also, the structural properties of the soils are poor, whereby soil aggregates tend to be unstable and are susceptible to erosion and surface sealing. In areas with poor vegetative cover the topsoil becomes eroded, whereby the exposed surface becomes very hard when dry giving the false impression of hardpans.

The geotechnical investigation along the road sections indicate the subgrade soil types as are dominated by clayey SANDS, sandy CLAY, silty SAND, and to a smaller or rather occasional extent soils SILTY and GRAVEL.

4.2.6 Ground and Surface Water Resources

4.2.6.1 Ground Water Resources

The project area is located within the internal drainage basin, which is characterized by high ground water potential in the Basement Complex rocks. The study indicates some boreholes in the Dodoma plain have exceptionally high yields of about 460 m^3/hour, when compared to the average yield of boreholes, which is usually 11 m^3/hour. Boreholes in Dodoma System are typically drilled to depths of 70-120 m.

4.2.6.2 Surface Water Resources

Due to semi-arid nature and high soil permeability surface water bodies are very few in the project area. The Bugiri **(**Error! Reference source not found.**5)** and Mkalama **(**Error! Reference source not found.**6)** Dams are the only available surface water bodies in the project area. The natural streams dry quickly after rainfall and usually collect run-off and store in their sandy stream beds or drain into swampy or marshland area or feed into ground water aquifers.

Figure 4.5: Location of Buigiri Dam at km 2+600 along Ntyuka R/A-Chinyoya R/A Road Section.

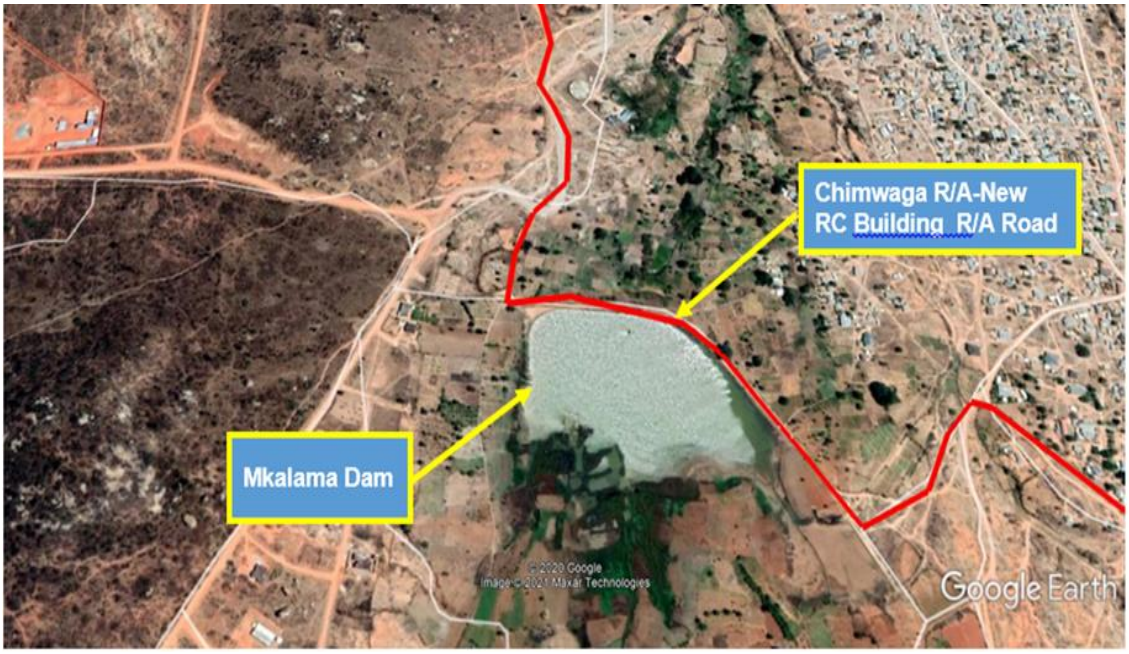

Figure 4.6: Location of Mkalama Dam along Chimwaga R/A-New RC Building R/A Road Section.

4.2.5 Biological Environment

4.2.5.1 Flora

The adjacent land is mainly covered by short grass throughout the road corridor. Scattered trees and shrubs are commonly found in the hilly areas. The natural vegetation type is mainly thicket dominated by Acacia, Cactus and Wild Sisal plants. The natural vegetation has been degraded with patches of bare areas due to livestock grazing and frequent bush fires.

4.2.5.2 Fauna

There is no significant presence of wildlife around the project site. The fauna likely to occur are small mammals, birds, reptiles, and insects as common species typically found in cultivated and modified landscapes. These species have no known special biodiversity value, are not endemic, and are not listed under national or international conservation categories (e.g., IUCN Red List). Therefore, the project area does not support fauna of conservation concern, and no critical or sensitive habitats are present.

4.2 Socio-Economic and Cultural Environment

4.3.1 Geographical Location

The project is located within the Dodoma City, which is the headquarters of Dodoma Region and Capital City of Tanzania. The Dodoma City forms part of Dodoma Urban District, which is one of the 7 Districts of Dodoma Region. Other districts include Chamwino, Bahi, Mpwapwa, Kongwa, Chemba and Kondoa. The Dodoma Municipality forms boundaries with Bahi District to the south, west and north; and Chamwino District to south, east and north. Specifically, the project roads traverse through Viwandani, Kilimani, Makole, Tambukareli, Dodoma Makulu, Kikuyu Kusini and Iyumbu Wards.

4.3.2 Population Dynamics

Over the past years, the population of Dodoma urban district has been increasing steadily. In 2002 it was 322,811 (PHC, 2002) representing an inter-censual population increase of 120,146 people from the population of 1988 which was 202,665. This is equivalent to 59% increase. The corresponding average population annual growth rate was 3.3%. Between 2002 and 2012 the population increase was 88,145 only, representing an increase of 27% implying a decline in the average population annual growth rate by 0.9% compared to the previous inter-censual period. In general, the Dodoma Municipal Council population dynamics is on a growing trend in both size and settlement (Dodoma City Socio-economic Profile, 2017).

4.3.3 Settlements and Housing Conditions

The housing conditions vary depending on the economic status of households. There are three types of housing structures in project area: (1) cement bricks with iron sheet /or tiles roofing (2) stone walls with iron sheet/tiles roofing; and (3) mud or timber walls with iron sheet roofing or grass thatched. Most of the houses in the centre of the town are constructed by brick and corrugated iron-sheets, also many government offices and few individual houses are constructed by bricks and the roofing is by tiles. New big expensive hotels and new expensive houses are also being constructed in Municipality indicating an attraction to medium and high -income people. Whereas the low-income people own/rent mud, wood and iron /grass thatched houses. These are mostly located in the squatter areas or in the outskirts of the municipality.

4.3.4 Land Use and Land tenure

The project is located within a built-up urban area, with dominant land use being residential (85%), followed by institutional and commercial land use (8%). The rest of the land use is agricultural and livestock keeping.

4.3.5 Infrastructure and Utilities

The common infrastructure/utilities include telephone cables (overhead or underground), electricity powerlines (overhead or underground), water supply pipelines, and sewer pipelines. These linear infrastructure/utilities are found to either cross or run parallel to the road sections, hence likely to be affected during construction.

To avoid this problem these infrastructure/utilities will have to be immediately relocated and restored before commencement of construction works. In addition, the design will consider provision of crossing service ducts to allow their maintenance in future without causing any damage to the road pavement.

4.2.5.1 Telecommunications

The telecommunication in the project area is provided by Tanzania Telecommunication Company Ltd (TTCL) and Mobile Telephone Service Companies such as Vodacom, Zantel, Halotel and Tigo. The presence of these service providers has enabled people to use mobile phones and get access to internet services. There are numerous telephone cables (underground or overhead), which either cross or run parallel to the road sections, hence

likely to be affected during construction. This problem will be avoided through immediate relocation and restoration before commencement of the construction works.

4.3.5.2 Water Supply

Dodoma Municipal Council depends on several sources including charcoal dams, shallow wells, open spring, rainwater harvesting and boreholes. Dodoma urban areas are mostly served by ground water drawn from Wami /Ruvu Mzakwe Basin at Mzakwe Village. This basin is about 30 km north of Dodoma town and has the potential of producing 72,000 m^3 of water per day.

The management of water supply in Dodoma urban is under DUWASA. The system of water service involves two pumping station located at Mzakwe three (3) booster stations located in town 90,460m3 are located in Kilimani, Itega, Imagi and Kitunda hills.

There are numerous water supply pipes, which either cross or run parallel to the road sections, hence likely to be affected during construction. This problem will be avoided through immediate relocation and restoration before commencement of the construction works.

4.3.5.3 Electricity

TANESCO is the sole supplier of electricity in the project area though not in every hamlet; and even in the hamlet with electricity not all households use it. There are numerous electricity powerlines (overhead or underground) which either cross or run parallel to the road sections, hence likely to be affected during construction. This problem will be avoided through immediate relocation and restoration before commencement of the construction works.

4.3.5.4 Sanitary Facilities

The management and services of sewage disposal is under multiple authorities including DUWASA (Dodoma Urban Water Supply and Sanitation Authority) and private sector. Most of the households are using septic tanks that discharge into the sewerage system, which transport the raw sewage waste water to the Waste Stabilization Ponds (WSP). The sewer pipelines either cross or run parallel to the road section, hence likely to be affected during construction. This problem will be avoided through immediate relocation and restoration before commencement of the construction works.

Other households are using on-site treatment for disposal of human wastes based on septic tanks soak way system and pit latrines. These households are serviced by Vacuum Emptying Trucks, owned by Private Operators, which are usually hired by household owners.

4.3.6 Social Services

4.3.6.1 Education

Education in Dodoma Municipal City is provided by public and private sectors. Statistics show a steady improvement in most components of education services and facilities. The number of primary schools in Dodoma City Council increases from 111 in 2012 to 122 in

2016 whereby, the largest share was dominated by public schools in terms of distribution and quantities.

The number of secondary schools in City has been constant for two years (2014/15 and 2015/16) at 36 and 15 secondary schools for public and private respectively. There are only 7 Academic Institutions and 14 Vocational training schools (Dodoma City Socio-economic profile, 2017).

4.3.6.2 Health

In Dodoma Municipal Council there are 76 health offering facilities, among which 51 are owned by government while the remaining 26 are owned by private entities including religious institutions and individual health specialists.

Among all diseases, ARI is pronounced to be the most common disease in tropical area fall second in treatment cases with 57.3% behind Malaria which has been reported to have more than 25%. Moreover, in such list of the highly treated diseases in the region included Diarrhoea diseases, skin diseases, pneumonia, asthma, intestinal worms, eye diseases and other diagnosis.

The rate of HIV/AID infection has been decreasing yearly since 2012 where by the infection rate has decreased from 10.1% in 2012 to 5.6% in 2016 according to City medical office report 2017. However, the project will be required to implement HIV/AIDS prevention and control programme during construction phase because the project site is along the highway and community settlements whereby truck drivers and workers interact with local people.

5.0 STAKEHOLDER CONSULTATIONS AND PUBLIC PARTICIPATION

5.1 Stakeholder Identification and Analysis

The ESIA of this project have been prepared as per ESF requirement. The Consultation and Public Engagement, Impacts Identification and Analysis, Compensation and Relocation of the affected properties, Vulnerable Group consideration, Labour Relation aspects, Grievances Redress Mechanism, as well as Occupational Health and Safety Management will be undertaken as per requirements of the WB- ESS 1-10 of the World Bank.

Stakeholder Engagement and Disclosure is of importance in the engagement process during an ESIA study and it ought to be open and transparent between the Developer and its stakeholders. The purpose of stakeholder consultation among others is to obtain stakeholders concerns, opinions and feedback to improve the project design which follows the peoples centered approach design. Through consultation, the design will provide the provisions of pedestrians and cycling infrastructure, dedicated bus lanes where required as well as bus stops and shelters, dual carriageways with two mixed traffic lanes in each direction, road safety improvements, improved drainage infrastructure and climate resilient design in identified low lying areas, green space, and other improvements. The road design shall be undertaken through series of Consultations with stakeholders from design, implementation and operation phases to obtain their opinions as well as give feedback to relevant stakeholders who are pivotal for this design approach to help the project proponent to identify and mitigate any potential adverse impacts. ***Stakeholder engagement can improve the environmental, social, Health and safety sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation***. It is an inclusive process conducted throughout the project life cycle and where properly designed and implemented, it supports the development of strong, constructive, and responsive relationships that are important for successful management of a project's environmental and social risks. It is most effective when initiated at an early stage of the project development process, and is an integral part of early project decisions and the assessment, management, and monitoring of the project's environmental and social risks and impacts.

The identified stakeholders can be categorized into Developers; Decision makers; Interested parties; and Affected parties positively or negatively and directly or indirectly. The stakeholder analysis matrix is provided in **Error! Reference source not found..** The identification of stakeholders was based on how they are related to the project, how the project is going to affect them and why should they be consulted.

During consultations, stakeholders were briefed on the proposed road project, the EIA process, and governing environmental legislation. They were then given opportunities to air their views and opinions concerning the project, with regard to environmental and social issues, that are of concern to them. The outputs of the meetings and interviews were identification of major issues and impacts, which are considered in the preparation of EIA report.

5.1.1 Developers

The developers in this project are the Ministry of Works, Transport and Communications (MoWTC), the Tanzania National Roads Agency (TANROADS).

5.1.2 Decision makers

The decision-making authorities are those institutions dealing with environmental management in the country and therefore they can decide on whether a project should be implemented or should not be implemented. These include the Division of Environment in the Vice President's Office (VPO-DOE) and National Environment Management Council (NEMC). The VPO-DOE is responsible for approval of Environmental Impact Assessment report and issuance of Environmental Impact Assessment (EIA) Certificate.

The National Environmental Management Council (NEMC) is responsible for screening and registration of the project, review and approval of scoping report and review of environmental impact assessment report and submission to the VPO-DOE for approval.

5.1.3 Interested parties

The interested parties are those stakeholders who are not directly or indirectly affected by the project but they can influence the success or failure of the project or can provide advice to the project. For this project, the interested parties include the Dodoma City Council (DCC). The Local Government Authority (LGA) is responsible for urban planning and issuance of building permits.

5.1.4 Affected Parties

These are those stakeholders who can be directly or indirectly affected, whether positively or negatively by the project. The infrastructure / utility authorities namely, Tanzania Electricity Supply Company Limited (TANESCO), Tanzania Telecommunication Company Limited (TTCL), and Dodoma Water Supply and Sanitation Authority (DUWASA), are considered to be indirectly and negatively affected because their infrastructures/ utilities are likely to be affected.

Local community members living adjacent to the road sections. These include sub-wards council leaders as well as individual community members who live in wards along the proposed project area. These stakeholders will be directly and positively affected due to creation of temporary employment and/or increased income generation opportunities during construction. It is expected that during construction some of the local people will get temporary employment opportunity as casual labourers, hence considered to be directly and positively affected parties. Also, during construction, some of the local residents will get opportunity to increase their income by selling food items to the construction workers, hence considered to be indirectly and positively affected parties.

The local community are also indirectly and negatively affected due to environmental, health and safety effects associated with the project activities. It is anticipated that during construction the project is likely to create some air pollution and risk of health and safety hazards to the local people; and therefore, considered to be indirectly and negatively affected parties.

5.2 Results of Stakeholder Consultations

5.2.1 Consultation with Stakeholder Representatives

The consultation with stakeholders' representatives was carried out through face to face interviews. According to the stakeholder representatives the project will be beneficial as it will reduce traffic congestion and stimulate economic growth in the city. However, the stakeholder representatives expressed their concerns regarding the project. **Error! Reference source not found.**1 provides the summary of issues and concerns raised by the stakeholder representatives during consultation process and sections of ESIA Report where they have been addressed.

Table 5.1: Summary of Issues/Concerns Raised by Stakeholder Representatives.

Stakeholders	Issues / Concerns by Stakeholder Representatives	Section of ESIA Report
Dodoma City Council	Dust management and safety should be observed during implementation of the project.	Section 7.3.1
	Road traffic signs should be installed after the implementation.	Section 7.3.10
	The local Community should be consulted during construction of drainage channels.	Section 7.3.11
	The local people along the road section at Chinyoya have been informed and there is a plan to relocate them.	Section 7.3.6
TANESCO	Conflict with customers may occur during relocation of electricity power poles.	Section 7.3.5
	TANROADS must make payment before relocation of electricity power poles. Financial support should be enough and done early for the work to be effective.	Section 7.3.5
	If there is limited time the contractor can be authorized to relocate the electricity power poles.	Section 7.3.5
	If The contractor need assistance the company will provide where necessary.	Section 7.3.5
	There is a possibility of electric meters being destroyed during demolition of houses.	Section 7.3.5
	Proposed design should be provided earlier by the surveyor to identify the location of the electricity power poles that need to be relocated.	Section 7.3.5
DUWASA	Design should provide more space for other infrastructures such as water supply.	Section 7.3.5
	Upgrading of the roads may cause serious disruption of water supply to the communities and other institutions.	Section 7.3.5
	During construction, the Contractor should work closely with DUWASA to establish exact locations of these utilities before commencement of construction works.	Section 7.3.5
	Careful attention should be given to existing utilities as there are several water supplies pipelines along the project road.	Section 7.3.5
TTCL	There are underground and above the ground copper and fibre optic cable networks, and their inspection chambers, and telecommunication poles.	Section 7.3.5
	During construction the Contractor should work closely with TTCL to establish locations of such utilities to avoid damages. The Contractor should provide ducts for crossing of the utilities and their future expansion.	Section 7.3.5
	Excavation should not exceed 1m depth so as not to damage the underground cables. Excavation should be done by hand for the safety of the underground cable	Section 7.3.5

5.2.2 Consultation with Community Members

The stakeholder consultation meeting was carried out with local community members living along the project road. In general, the local community members do support the project because they think it will reduce traffic congestion in the city. **Error! Reference source not found.**2 provides the summary of issues / concerns raised during consultation with local community members, and section of ESIA Report where they have been addressed. The minutes of the consultation meetings with local community members are provided in **Error! Reference source not found.** 2.

Table 5.2: Summary of issues / concerns raised by local community members.

Issues / Concerns Raised by Local Community	Section of ESIA Report
(a) Define clearly where the project road will pass/cross.	Not Applicable (NA)
(b) Relocation of infrastructure and facilities like water supply pipes and electricity poles.	Section 7.3.5
(c) Compensation should be done for people followed by the road and should be done in time.	Section 7.3.6
(d) The surveyors should visit the site earlier prior to construction in order to demarcate boundaries of road reserve.	Section 7.3.6
(e) The public should be informed earlier on the day/date of valuation exercise so that everyone can be on his/her property to attest and sign appropriate forms.	Section 7.3.6
(f) Contractor should offer employment opportunities to the local people during implementation of the project.	Section 7.2
(g) Graves and other properties such as land and plants should be compensated.	Section 7.3.6
(h) Land restoration should be done after excavations and other project activities.	Section 7.3.12
(i) The community should be informed early on the limit time (closing date) for removing/demolishing their properties.	Section 7.3.6
(j) The project will increase waste generation, wastes should be managed safely during all phases of the project.	Section 7.12
(k) Loss of properties and business will occur during demolition of buildings in the road reserve areas.	Section 7.6
(l) Cultural interference and spread of diseases such as HIV/AIDS may occur, education should be provided especially to young girls and boys.	Section 7.13
(m) Dust emission should be controlled during construction activities by watering the road at least 2 times a day to reduce dust.	Section 7.3.1
(n) Road signs, bumps and lights should be placed where necessary to avoid accidents.	Section 7.3.7 and Section 7.3.10

5.3 Information Disclosure

TANROADS has and will continue to disclose project information to allow stakeholders to understand the risks and impacts of the project, and potential opportunities for their engagement and participation. During the process of stakeholder consultations, MDAs, NGOs and the wider communities including the direct host communities were provided with

access to the following information, in order to ensure meaningful consultations on project design:

a. The purpose, nature and scale of the project;
b. The duration of proposed project activities;
c. Potential risks and impacts of the project on local communities, and the proposals for mitigating these;
d. The time and venue of any proposed public consultation meetings, and the process by which meetings will be notified, summarized, and reported; and
e. The process and means by which grievances can be raised and will be addressed. The information was disclosed in Kiswahili and in a manner that was accessible and culturally appropriate.

This being a Substantial Risk Project by Classification as per World Bank's ESF, the ESIA will be subjected to second round of disclosure and stakeholder consultations, especially to report back on proposed mitigation actions and provide feedback on how community/stakeholder concerns have been addressed. The report will be disclosed at the respective districts and regional headquarters and Government Ministries and Agencies' websites for further public comments once it is cleared by the World Bank and also approved by NEMC. Any arising comments shall be compiled by TANROADS and accordingly incorporated into the ESIA report, and submitted to NEMC for final review and/or approval.

5.4 Conclusion

Consultations with key stakeholders and public involvement were undertaken in order to obtain views and concerns of the local community on the project.

A combination of methods which complemented each other was used to obtain different relevant information for the project. Various stakeholders were identified and consulted and these comprised of private sector, CBOs, government agencies / institutions at different levels and communities in respective villages where public meetings were conducted. Roles of stakeholders were identified as well as their possible involvement in undertaking some project interventions, such as capacity building (HIV and AIDS interventions, etc.), information dissemination to people, etc.

The crucial concern and sensitive issue that almost dominated all public consultative meetings in villages and even among some government agencies were matters related to valuation of properties and compensation. People, especially those who will be negatively affected insisted upon transparency and participation of the PAPs during the whole process, fairness and immediate compensation for the PAPs.

Overall, stakeholder consultations and public involvement were successfully conducted and intended objectives were met as collected information will be incorporated into the project document for further rehabilitation. Greatly, the stakeholder consultations and public involvement contributed to disseminated project information and clarified issues and questions raised by communities and other stakeholders. Communities appreciated their involvement as a fundamental and recommended TANROADS to continue with people

centerd approach design through the project cycle. ***Stakeholder engagement can improve the environmental, social, Health and safety sustainability of projects, enhance project acceptance, and make a significant contribution to successful project design and implementation***. The project was commendable and accepted by the stakeholders as beneficial to their environmental, social, health and safety development and the country as a whole.

6.0 ASESSMENT OF IMPACTS AND ANALYSIS OF ALTERNATIVES

Preamble

In this report, the term “environmental effects” will be taken to be synonymous to the term “environmental impacts” as referred to in the EIA and Audit Regulations (2005). As such, the ESIA study considers environmental and social effects and impacts as defined by the national legislation. However, for convenience the term “impact(s)” shall be used throughout this report, unless otherwise specified.

The assessment of impacts has been carried out in two steps, whereby the first step is identification of impacts and the second one is determination of significance of impacts. The identification of impacts takes into consideration those impacts which solely arise due to intrinsic (inherent) value of the OSIS facility; and those impacts which result from interaction between the Project related activities and Valued Environmental Components (VECs).

In general, the Consultant’s approach deviates from the common practice of generalization of impacts to become more specific by identifying effect/impacts of project activities on each VEC. The approach goes further by identifying cumulative effects/impacts due overlap between the project activities with those of the past, present and future planned projects; residual impacts after application of mitigation or compensation measures; impacts of the potential environmental effects arising from credible accidents, malfunctions and unplanned events; and effects of the environment on the projects are assessed.

6.1 Identification of Impacts

Definition of actions in each stage of the project was done, which were considered as actions caused by a simple, concrete, well-defined and located cause of the impact.

Table 6.1: Concrete Actions on the Project Phases

Phase	Action
Planning and Design phase	Preparation of E&S guiding instruments (ESIA, ESMP. RAP, SEP, LMP, GRM and ESCP; undertaking of Valuation of affected Properties and compensations of PAPs.
	Compensation and relocation of affected PAPs as well as starting the relocation of utilities such as power lines, water pipes, or telecommunication lines away from the road construction corridor.
Mobilization phase	Recruitment of some workers including E&S key and supporting staff to undertake the E&S implementation; preparation of E&S working instruments to guide the Contractors as per ESIA and ESMP requirements i.e ESMP, OHS, WMP, TMP, GRM, LMP, SEP and QBMP as well as Applying the required Permitting and/Licensing
	Continue with relocation of utilities such as power lines, water pipes, or telecommunication lines away from the road construction corridor.
	Site clearance and vegetation removal at contractor campsites and workshops, verification of working project corridor
	Identification of sources of construction materials and preparation of the E&S guiding instruments as per ESIA and ESMP
	Land clearing, Setup & construction of contractor's camp/s including provisional facilities (building offices, machinery and equipment warehouses), installation of concrete and crusher plants)
	Mobilization of construction vehicles and equipments as per Contract.
	Transportation of consumables, equipment, materials and Staff
	Storage of materials, equipment and machinery
Construction phase	Construction/Maintenance of access road to borrow pits/quarry site
	Sourcing/preparation and transport of construction materials, including stone quarrying, blasting of rocks, gravel, sand and stone borrowing, preparation of cement, timber, reinforcement bars, asphalt, casting of pre-cast materials such as concrete culverts etc.
	Construction & Maintenance of Diversions
	Continuation of the recruiting of the additional workers
	Site clearing works, including cutting of trees
	Earth works including removal of top soils, river's dredging, excavation, cutting/filling, and compaction
	Demolition and removing of the existing structures to be replaces
	Bitumen processing and tarmacking activities
	Construction of bridges, which will include such activities as welding works, concrete works, metal works, bridge protection works

	Creation of storm water drainage channels, relief culverts on bridge approaches
	Collection and disposal of waste materials i.e scrapers, dredges, spoilt materials removed from excavation of existing road
	Assessment and mitigation of temporary socioeconomic impacts related to restricted access to businesses, including measures for maintaining access, signage, and compensation/livelihood restoration for verified income losses.
Demobilization phase of the project.	Land restoration in provisional roads and temporarily disturbed areas. Reinstate the affected land and borrow pits areas
	Dismantling all the project equipment's and machinery.
	Removing all the temporally facilities and machinery from site.
	Reducing number of workers, completion of the all activities under the snag lists
	Finalizing the road marking, installation of road safety and road safety signs, provide the road safety awareness campaign,
Operation & Maintenance phase	Opening of the road for transportation of people and goods, enforcement of road safety measures by the road authority.
	Monitoring the road use and safety aspects
	Road maintenance in case of any destruction.
Site Decommissioning	The decommissioning is not anticipated in near future.

6.1.1 Impacts' Generating Actions

In this section, key biological, physical, and social receptors were selected from the baseline data. The impacts of the Project activities on each of these "Valued Ecosystem Components" were evaluated using a significance ranking process. The environment complexity and its systemic nature was broken down into several levels to obtain simple and concrete factors:

Table 6.2: Components and Factors of the Environment

Environment	Component		Factor
Abiotic	Climate		Microclimate, Temperature, Rainfall
	Atmosphere		Air Quality
			Noise
	Land		Structure
			Quality
			Relief
	Surface water		Surface drainage (run-off patterns)
			Quality
	Groundwater		Aquifers recharge
			Quality
Biotic	Flora	Terrestrial	Habitat
			Distribution
			Species within any category
	Ecosystem		Biodiversity
Landscape	Landscape		Quality-vegetation cover, soil erosion
Socioeconomic	Economic		Change of land use
			Jobs

		Local and Regional Development
	Services Demand	Water
		Energy
		Communication
		Waste management and disposal
Occupational and Community Health and Safety are missing	Health and safety risks	Accident and incidents Ergonomic related activity Poor hygiene
	Communicable and non-communicable diseases	Occasional health related diseases related to Hazardous fumes, wastes, objectives Dusts,

6.1.2 Impact and Risk Generating Activities

i. Project preparation phase

Decisions that will be taken at this stage are important milestones that could influence the environmental and social soundness of the Project.

This phase which has started included all technical studies, non-technical studies (E&S instruments such as the ESIA and the RAP) as well as the tender process for the selection of a construction contractor.

The tender process for the selection of a construction contractor represents an important risk that will have to be prevented. Return of experience shows that E&S and H&S criteria for tenders and procurements of goods and services are often not developed or poorly defined. Often, the responsibility of implementing E&S and H&S measures does not cascade down to the contractors.

The need for temporary or permanent physical and or economic displacement were identified at project preparation, this is also an impact generating activity.
In summary, impact generating activities during Project preparation include:

- Finalization non-technical studies (mainly the RAP and ESIA).
- Tendering process for contractors.
- Resettlement and compensation payment of Project-Affected Persons (physically and or economically displaced).

ii. Mobilization phase

Construction laborers.

About 2000 workers, both skilled and unskilled, will be recruited during the project duration, in accordance with project phasing requirements. This phase entails mobilization of the labor force (300 workers are expected to be recruited, the majority (80%) of whom will be daily local casual workers and 20% will be professionals. The construction workers will not be residing at the contractor's campsite but will be off-compass residing from their homes in the surrounding villages/streets along the road. These workers will be managed through the project Labour Management Procedures (LMP) for DIST to be adopted by Contractor as per **Appendix 5.**

Contractor equipment's and facilities

The Contractor will mobilize equipment, machinery, and the installation of plants (asphalt and concrete) and construction of campsite facilities (permanent residential houses for the Supervising Engineer, offices, a laboratory, etc.), construction of temporary facilities for the Contractor (residential tents, offices, toiles, workshop, storage houses, oil storage tank, waste storage facilities, water storage tank/pond, security fence and gate), as well as the acquisition of permits required by law.

Diversion Roads/Detours

Diversion will be required to maintain a usable road during the construction period. Wherever practicable, alternative local roads will be used. The construction and maintenance of these diversion is expected to be of a standard that ensures the safety of the public, diversions outside the road reserve require additional permission of the land occupier. Impacts on private property during the establishment of diversions will be addressed as per the requirement of the project RPF. During demobilization phase the diversion will be executed by taking back the original topsoil and engineered to prevent soil erosion. Routes for the diversions will be selected within the construction corridor to follow the areas, which will have minimum impacts on the natural environments and yet have minimum cost implications. The Contractor shall develop and implement a dynamic ***Traffic Management Plan (TMP)*** to guide flow of traffic and smooth mobility during construction of the project road.

Contractor Campsites and Workshop

The main campsite will be constructed for the Contractor with an administrative headquarters for the Project. Another campsite (i.e., Engineers Compound) will be constructed for the Resident Engineer and his/her staff. Alternatively, both may be located at the same compound with shared facilities to minimize environmental footprint and maximizing resources efficiency. The Contractor's campsite for phase-1 among others, office space, materials laboratory batching and asphalt plant, machinery yard, workshop, fuel pump, first aid clinic, etc. The Engineer's compound will include Engineer's accommodation, laboratory, washhouse and office. Selection of the location of campsites will consider convenience for the Contractor to communicate with the Project Engineer and for Laboratory testing.

As provided in the Environmental Code of Practice for Road Works (URT, 2009), campsites must be adequately located to avoid or minimize environmental disturbance.

The Contractor shall observe the following conditions as a minimum:

i. The construction site's access paths, storage and parking facilities, Contractors campsites', site offices, and other temporary installations must be located at least 60m from permanent watercourses (including irrigation and drainage canals) or lakes and more than 30m from intermittent watercourses;
ii. Contractor campsite must be located at least 150m from the road reserve of a main road to reduce the harmful effects of noise and more than 500m from inhabited zones (including sensitive social receptors such as learning institutions, villages, hospitals etc.);

iii. Sites of exceptional interest (e.g. livestock crossing areas, ecological or archaeological) must be avoided;
iv. The campsite must be located at least 10km from classified forests to avoid the illegal harvest of wood for domestic purposes;
v. The operation of the construction campsite must not lead to conflicts with the local population over the use of local resources for domestic purposes.

It is anticipated that, the contractor will determine the location, size, capacity and type of camp(s) to be constructed based on contractual agreements between the procured contractor and the TANROADS during pre-construction phase. Before establishing the campsite, a thorough investigation shall be conducted on the potential areas based on technical, environmental, socio-economic and cultural factors. The selection, review and approval of preferred location site will involve the Contractor, TANROADS-Dodoma City Council, Ward/village/*mtaa* authorities along the road.

Power supply around the campsite.

As part of ESS-3 on energy efficiency, the contractor campsite will install the standby generator of 500kv to support on power backup instead of shortage of power from national grid. The campsite will be located along the areas which is accessible in term of electric power and other services to the Contractor and Supervising consultant. As part of energy efficiency, the Contractor will switch off all the machines and equipment's when not in use or during break hours as part of energy serving. Apply the administrative and engineering methods to budget for fuel consumption during project executions. Will also ensure that the Campsites is connected with National Grid as main supply of electricity for equipment and machinery.

Compensation of affected properties and relocation of affected utilities along the road.

The road widening will affect some properties along the road including houses, kiosks, trees which belong to PAPs, the project will also affect the utilities such as electrical poles, water pipes, and communication cables along the road that need to be relocated. The affected properties shall be relocated out of 45m of RoW within road section prior project executions.

iii. Construction phase (for road widening/rehabilitation)

The followings are impact generating activities during construction (road widening/rehabilitation):

- Setting up worksites and campsite (both permanent campsite and mobile camps), mobilization of machinery and workforce.
- Changing road conditions such as narrow lanes, changing traffic patterns and potential derivation roads.
- Land clearing and earth work to increase the road width from a total of 10.5 meter to a total of 12.0 meters. Some geometry changes will also require land clearing and earth work to reduce deep cut sections and high fill areas. This will be done by shifting the road at some areas of a few meters. Some interventions will be necessary at truck bays and rest areas and at road junctions.
- Removal of existing bituminous seal.

- Removal and stockpiling of the existing granular base course layer for reuse.
- Insitu stabilization of the layer of existing subbase using cement.
- Asphalt paving: surfacing of 50mm thick asphalt concrete over carriageway and shoulder and compaction.
- Construction of 7 arrester beds in areas with long steep grades in order to assist and control heavy vehicles to safely stop.
- Existing concrete box culverts along the road section are structurally and hydraulically sound and will be retained, although they require to be extended in order to accommodate the widened road cross. All existing metal culverts along the road are to be replaced with concrete pipe culverts due to age. Arched culverts will be fully replaced by box culverts.
- Construction work will require raw materials from borrow areas, quarries and sand pits. Construction work will also require water to be used in concrete. Blasting and crushing stones are impact generating activities.
- All construction activities will lead to truck and machinery movement.
- All construction activities will produce waste.
- ***NOTE: The PCB related wastes or other dismantled electrical equipment along the road and asbestos from bridge infrastructure will not be part of the generated wastes along the road as the road project does not includes such wastes.***

iv. Operation and maintenance phase

Many impacts and risks presented for the operation phase, the cause-effect relationship between the road rehabilitation and negative impacts are rather difficult to demonstrate. As demonstrated in the alternative assessment chapter 6, if compared to the "without project", the road rehabilitation does not likely lead to the significant increase of road traffic volume because **(i)** the increase of traffic volume is largely driven by local and regional economic development, which would happen regardless is the road is rehabilitated. **(ii)** Each road lane is increased by 0.25 m mainly due to safety consideration but no additional lanes will be built, **(iii)** the objective of the road is to improve the safety, climate resilience and to reduce vehicle travel time, and not to increase traffic volume. Therefore, some of the impacts during operation are not new impacts but rather the continuation of pre-existing impacts (on-going effects).

Improvement of the road condition will reduce the time for travelling from one area to another within the project road. One important change that the new road operation will bring is to design additional walkways for non-motorized means of transportation, which will improve overall safety of road users within Dodoma city under DIST. Other initiative will be implemented to improve safety such as the speed reduction in villages, climbing lanes where the vertical gradient is greater than 7% and the installation of arrester beds to assist out of control heavy vehicles to safety stop. The interaction between the intended project activities and the different environmental receptors is summarized in a simplified matrix presented in Table 6.3.

Table 6.3: Environmental and Social Impacts Matrix for the proposed widening/Rehabilitation

		Impact Rating Criteria					Impact Significance Rating			
S/N	Environmental parameters/Impacts	Spatial Scale	Temporal Scale	Reversibility	Cumulative Effects	Residual Impact	Mobilization Phase	Construction Phase	Demobilization Phase	Operation and Maintenance
1.	Creation of Employment and Business opportunities									
2.	Land expropriation, loss of property, and resettlement									
3.	Environmental opportunities									
4.	Infringement of public utilities									
5.	Soil erosion and instability of slopes				✓					
6.	Risk Water and Land Pollution									
7.	Increased noise, vibration, and air pollution				✓					
8.	Increased spread of HIV/AIDS				✓	✓				
9.	Safety and health risks									
10.	Increase road accidents				✓					
11.	Increased water abstraction									
12.	Increased Waste									
13.	Interference to local hydrology					✓				
14.	Loss of definite materials and land degradation					✓				
16.	Loss of Biodiversity				✓	✓				
17.	Increased in migration									
18.	Enhanced socio-cultural interaction					✓				
19.	Improved transportation across the three regions									
20	Labour Influx	Local	Temporary	Reversible	Medium	Low	✓	✓	✓	—
21	SEA/SH/GBV Risks	Local	Temporary	Reversible	High	Medium	✓	✓	✓	—
22	Temporary impacts on businesses (loss of income)	Site-specific	Temporary	Reversible	Low	Low	—	✓	—	—
23	Improved community life and services									
24	Improved accessibility to agricultural markets									
25	Increased natural resources exploitation rates				✓					

Key: **Spatial Scale:** Local (L), Regional (R), National (N)
Temporal Scale: Short Term (ST), Medium Term (MT), Long Term (LT)
Reversibility: Reversible (R), Irreversible (IR)
Significance: Highly Adverse (-3); Adverse (-2); Mild Adverse (-1); No impact (0); Mild Beneficial (+1); Beneficial (+2); highly Beneficial (+3);

6.2 Impact identification and mitigations Road Section

The impacts are categorized into Mobilization phase impacts, Construction phase impacts, and Operational and maintenance phase impacts. The main receptors of impacts associated with the anticipated road widening include physical resources (hydrology, surface water quality, soils, air quality, and noise); ecological resources (vegetation); material assets, public health, safety, aesthetics, and landscape.

The following impacts were identified to be likely to occur during the pre-construction/mobilization phase; Many ES impacts that materialize during project implementation originate at project preparation due to inadequate stakeholder engagement activities and absence of coordination with procurement specialists to integrate ES mitigations in bidding documents for contractors. This can apply to all ES impacts and risks.

i. Impacts on Biophysical and Socioeconomic components.

Many biophysical and socioeconomic components may be affected if tendering process for contractors do not include specific requirements for their safeguard. Many contractor and subcontractor are not aware of their E&S and H&S responsibilities during construction work. During construction, contractors have the greatest day-to-day presence on the ground and sustained interactions with affected communities. Unfortunately, many are genuinely not aware of their responsibilities because the procurement documents have not included the E&S and H&S requirements and their contract is silent on these subjects or because the project owner has limited leverage over them. Experience has shown that many bidding documents do not consider measures developed in the E&S instruments and that many subsequent E&S problems, especially those that affect neighboring communities, arise from lack of proper planning and absence of leverage for non-compliance. Several important issues are often neglected during construction work such as enforcing a Code of Conduct for all workers, implementing an effective and culturally appropriate Grievance Redress Mechanism and Gender-Based Violence (GBV) prevention measures. Often the responsibility of implementing E&S and H&S measures does not cascade down to the contractors. However, there will be design review processes after engaging the Contractor and supervision consultant, mainly during mobilization phase, among others the design review will update and include the E&S aspects identified in this ESIA into design report as the binding instruments during execution of the project.

Impact significance

Since this type of risk can have implication for all E&S components, assessment of its significance is specifically assessed in the next section for each component (Construction phase impacts and risks).

Mitigation measures

The selection of the construction contractor will be required to be issued the addendum contract by TANROADS in regarding to the design review undertaken so that to be able to include all critical E&S aspects which was not part of tendering during the tendering process, hence were not included into Contract and BOQ.

It is also key that call for tenders and contracts for construction contractors include measures developed in the ESMP. In addition, some measures proposed in this ESMP involve a cost for the construction contractor, call for tender shall be clear on the requirement to quantify health and safety measures and other measures in the Bills of Quantities (PPE, oil spill kit, etc.).

- TANROADS shall integrate appropriate requirement in the tender documents for contractors. It is important to highlight in tender documents that there are key issues such as preparation of E&S working instruments, protection of watercourses along the road that will need to be protected from encroachment, deposition of demolition waste and rubbles. It is also important to include requirement to ensure proper labor condition and protection against GBV/SEA. The framework ES instruments developed as part of DIST (such as the GBV action plan and the Labor Management Procedures) shall be included in tender and in contractual documents.
- TANROADS shall integrate detailed requirements in contractual documents for contractors and use of covenants in contracts. Covenants are formal obligations and prohibitions that the company must respect, they are not subject to interpretation.
- It is key that ESMP actions be translated into contractual terms so that ES requirements cascade down to contractors and that they know their responsibility upfront. Tender and contractual documents shall highlight that contractors are required to abide by the ESMP.
- TANROADS shall ensure that appropriate wording on the chain of responsibilities is included in contractual document to ensure E&S and H&S measures cascade down to the contractors.
- TANROADS shall establish the management structure at TANROADS to supervise E&S and H&S aspects of the project as required in the Environmental and Social Commitment Plan (ESCP) of the DIST project.
- The Supervising engineer shall use environmental and social screening to ensure that selected quarries and sand pits do not cause any environmental damages to natural and sensitive area as well as destruct the surrounding natural environment and avoid risks for neighboring communities.

Residual impact

The assessment of the significance of the residual impact, which would take place during construction, is done in the next section (Construction phase impacts and risks).

ii. Impact and risks on biophysical components during construction phase (road widening\rehabilitation)

❖ ***Impact on soil quality***

This section focuses on impacts and risk on soil. The following impacts and risks were identified in the impact identification matrix:

- Impact on soil quality from accidental spillage of oil from construction equipment/ machines and poor management of hazardous (such as used car batteries, oil filters,

health care) and non-hazardous waste (metals, plastic, paper, wood, organic) and sanitation. All construction activities represent risk of accidental spillage of oil and will generate waste that could affect soil quality if poorly managed.

- Impact on soil from sealing of additional permeable surface and compaction by machinery. Many construction activities will require to seal additional permeable surface and will lead to soil compaction.
- Climate change impacts may cause extreme temperature and precipitation that can affect road network and connectivity.

- Climate change will directly affect the proposed road infrastructure in several ways including High temperatures and high precipitation will allow new road to easily develop potholes, cause road to easily develop cracks within a short period after their construction.
- Soil erosion and earth grabbing from borrow pit and quarry site operations. Four sources of crushed stone materials were identified within the project area.

Impact significance

Road widening/rehabilitation work is a material intensive industry. Residual material will be produced in large amount during widening/rehabilitation, some of which can be ***Hazardous wastes*** to be generated by the road construction. However other waste will include solid and liquid wastes, medical related wastes; gaseous wastes that will be generated from construction activities in road corridor, contractor's campsite, quarry site and borrow pits areas and therefore shall be handled as per national laws and WBG EHS guidelines. *(Whether be degradable, barrier, recycled)* as specified in the project ESMP and Waste Management Plan (WMP). Earthwork, removal of pavement layers, demolition waste, waste collected at workers camp, and green waste from vegetation removal are important aspects of construction activities.

The potential hazardous wastes to be generated by the road project includes, *(spillage oils, scrapers, greases, batteries, used oil filters, , bitumen drums); other hazardous wastes will be from CFC gases from AC, refrigerator and other sources at workshop, E-wastes from transmitters, television and A/C (dusts, HC, Nox, CO), hydrogen).* Also, the study has undertaking waste assessment and management of the potential risks associated with waste generation on soil, air, surface and groundwater bodies, as well as health and safety impacts for both workers and local communities as presented in chapter 6 and 7 of the ESIA. However, the wastes related to equipment containing PCBs (e.g., transformers, capacitors, and other electrical equipment), and waste containing asbestos (e.g., asphalt, bridge structures, etc.) are not anticipated along the project due to the nature of the materials to be used for road construction does not contain such wastes.

The intensity of the impact is medium, the extent will be punctual and the duration temporary. The significance of the impact would be minor.

	Impact on soil quality from generated hazardous wastes including accidental (spillage oils, scrapers, greases, batteries, used filters, bitumen drums); other hazardous wastes will be from CFC gases from AC, refrigerator and other sources at workshop, E-wastes from transmitters, television and A/C (dusts, HC, Nox, CO), sanitation	**Impact on soil pollution from oils spillage and land degradation from sealing of additional permeable surface and compaction by machinery**	**Climate change impacts may cause extreme temperature and precipitation that can affect road network and connectivity**
Intensity	Medium	Low	Low
Extent	Punctual	Local	Local
Duration	Temporary	Permanent	Permanent
Significance	Minor	Moderate	Moderate
Occurrence probability	Potential occurrence	Potential occurrence	Potential occurrence

Mitigation measures

- Good housekeeping shall be practiced within material storage compounds or vehicle maintenance yards where the possibility of spillage is great. This shall be done by installing spill tanks and secondary containment at vehicle maintenance yards.
- Given the absence of landfills in the vicinity of the road, waste management will be a challenge not only in terms of pollution but also in terms of nuisance and health risk (if local dumpsites are poorly managed).
- Undertaking study on hydrology along the road.
- Proposal of the culverts and bridges that ca accommodate the risks of high precipitation caused by heavy rainfall.
- Design for bridges and culverts shall consider the factor of adjustment of 15% to accommodate the extreme weather event.
- Undertaking of regular cleanness of drainage and culvert before rain season.
- The selected Contractor shall undertake Environmental and Social Due Diligence to ascertain the statutory compliance status of the selected Quarry/is to supply the project. The Query site and Borrow pit operation plan (QSMP) shall be prepared and approved by Engineer/Client before operations.
- Regular training shall be given to workers on Query site on safety issues.
- Water sprinkle shall be installed to mitigate air pollution.
- Clearance of unnecessary vegetation along the road and around the site for construction materials shall be minimized.
- Design and establishment of storage areas and containers for both hazardous *(spillage oils, scrapers, greases, batteries, used filters, bitumen drums); other hazardous wastes will be from CFC gases from AC, refrigerator and other sources at workshop, E-wastes from transmitters, television and A/C (dusts, HC, Nox, CO)* and non-hazardous wastes at the various construction fronts must be properly designated and clearly marked as containers for hazardous wastes.
- Undertake clearly labeling of all areas, containers, rooms with information detailing the contents, associated hazards, proper handling procedures, and necessary precautions for the intended wastes.
- Ensure separating of hazardous wastes and storage separately, not mixed with other types of hazardous waste or with non-hazardous wastes.
- Restatement plan shall be prepared and used during closure of the site.
- Undertake the regular monitoring to check compliance.
- Quarry site without management plan and approval of Engineer as per E&S requirements shall not be engaged/involved in project activities.

Collect, separate and send waste to the appropriate service providers:

- The contractor shall provide sufficient waste bins at work site and workers campsite and all off-site facilities. These shall allow for the separation of domestic hazardous and non-hazardous wastes. Hazardous waste collection shall also be separated between medical waste and other hazardous wastes to be collected by the authorized waste dealer for disposal.

- When dealing the hazardous wastes, the contractor Waste management plan and Emergency preparedness plan shall have to be in place as the mandatory tools for OHS accidents and incidents management along the project.
- At the campsite, rubbish containers shall be installed in a shelter on a wooden, metal, or concrete stand. Such containers must be emptied at regular intervals to avoid unpleasant odors associated with decaying organic materials.
- Hazardous wastes (liquid) shall be handled in designated area with concrete surrounding or containers around the workshop to avoid spillage. Collected liquid waste shall be managed by designated service providers for disposal.
- Hazardous waste (solid) such as *(scrapers, batteries, used filters, bitumen drums) shall be collected* and stored in the designated area. Collected solid waste shall be managed by designated service providers for disposal.
- Hazardous waste (medical) at the workers nursery shall be stored in biohazard containers and shall be disposed through incinerator to nearest district hospital or health center.
- Burning of any type of waste shall be forbidden, this includes but is not limited to oil, plastic, tires, and domestic waste. Burying waste in the workers camp shall also not be authorized.
- Storage areas and containers for both hazardous and non-hazardous waste at the various construction fronts must be properly designated and clearly marked. Containers for hazardous waste must be clearly labeled with information sheets detailing the contents, associated hazards, proper handling procedures, and necessary precautions. Hazardous waste should be stored separately, ensuring it is not mixed with other types of hazardous waste or with non-hazardous waste.
- Along the road sections there are several waste dumping sites which belong to government Municipality that shall be used for wastes disposal. These waste dumping site shall be used by contractors to dump the waste to be generated from the project site (solid and liquid waste) except for those hazardous waste which shall be collected by authorized waste dealer for disposal according to the applicable laws. In addition, the Supervising engineer shall validate the waste to be generated and approval the methods of disposal as per Waste Management Plan.

Distance of the dumpsite to residential areas.

- *Distance of the dumpsite to the nearest watercourse. Absence of impact on watercourse.*
- *Absence of impact on groundwater.*
- *Type of soil, it is preferable to select a site with impermeable soil and to avoid sandy areas.*
- *Overall management of the dumpsite (cleanliness, etc.).*

In both cases, the contractor shall provide proofs of signature of an agreement with a waste collection company and the local municipality to the Supervising engineer.

Collect, separate, reuse and dispose of demolition waste:

- *Bituminous waste shall be stockpiled for reuse at locations designated by the Supervising engineer.*
- *Disposal of demolition waste shall be done in accordance with clause 1713 of the Standard Specifications for Road Works 2000.*

Collect and manage wastewater:

- *The campsites shall have adequate toilets with septic tank. A contract with a service provider shall be established for regular maintenance and regular emptying.*
- *Septic tanks shall be installed in areas of stable soils that are nearly level, well drained, and permeable, with enough separation between the drain field and the groundwater table or other receiving waters.*
- *Mobile toilets shall be available to workers when working on the road sections. A contract with a service provider shall be established for regular maintenance and regular emptying.*

Refueling and Oil Tanks

- *It is required to install secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids.*
- *Refueling shall be done in designated areas with minimal risk of collision with other vehicles.*
- *Small refueling stations and oil barrels must be on impermeable surfaces with controlled drainage (drip trays to collect small spillages).*
- *All fuel bowser (trucks) shall have a certified spill response kit with granular absorbent, bags and containers to remove polluted earth in case of spills. All workers handling fuel shall have proper training on the correct transfer and handling of fuels and chemicals and the response to spills.*
- *In case of small oil spills, granular absorbent shall be put on the spill. The contaminate earth shall be excavated and sealed in bag to be sent to appropriate treatment plants. Contaminated soil shall not be sent to municipal dumpsites. In case of large oil spills, the spill shall be contained and the site isolated with fences. The appropriate agency shall be contacted for guidance, and contaminated soil shall be excavated and transported to the designated treatment facility.*
- *A Wastes material management plan of this ESIA shall be adopted by the contractor in its Construction-ESMP.*
- *To mitigate the impact of soil compaction, the main measure is to ensure to confine work within the RoW and avoid unnecessary encroachment.*

Residual impact

With the implementation of the recommended mitigation measures, the intensity of the impacts would be reduced to low and the duration to temporary. The significance of the impacts would be minor.

iii. Impact on hydrology, water quality and aquatic habitats

This section focuses on impacts and risk on three components that are interlinked: hydrology, water quality and aquatic habitats and fish. The following impacts and risks were identified in the impact identification matrix:

Impact on hydraulic transparency from construction.

- Impact on surface water quality during construction with expected increase of turbidity
- Impact of accidental spillage of oil and concrete wash water on surface water quality
- Modification of aquatic habitats from widening of culverts
- Impact on ecological continuity of aquatic habitat from culvert rehabilitation
- Disturbance of aquatic habitats and fish from water abstraction.

Impact on hydraulic transparency from construction, modification of aquatic habitats from widening of culverts and impact on ecological continuity of aquatic habitat from culvert replacement

131 Culverts will be upgraded and widened, and new roadside ditches will be created. If not properly sized, these could reduce hydraulic transparency and impact aquatic habitats but also traditional irrigation (recession agriculture and paddy fields).

These activities will modify small areas of aquatic habitats in order to accommodate the widened cross section of the road. Removal of bridges and culverts wing wall will leave part of the stream bank with bare soil and intervention on stream banks could lead to erosion, deposition of demolition rubbles and in turn affect water quality and the aquatic habitat. Lastly culverts replacement/rehabilitation may impact ecological continuity. If work require temporary diversion or blockage of streams (this is particularly true at locations at permanent stream location, where box culverts will be installed or widened).

Impact on surface water quality during construction with expected increase of turbidity

Erosion and leaching of stocked material and spoils, runoffs and removal of vegetation on roadsides, lack of proper sanitation and poor drainage on contractor campsite could affect water quality. Installation and removal of culverts wing walls and bridges construction as presented in the previous section could also affect water quality through erosion and sedimentation.

Impact of accidental spillage of oil and concrete wash water on surface water quality

All machinery that will be used for construction activities represent a risk of accidental spillage of oil to water courses across the road. In addition, discharge of concrete wash from concrete works and water slurry can seriously pollute surface water by increasing its pH and dirt's and this can seriously can affect aquatic habitat and local community on downstream.

Disturbance of aquatic habitats and fish from water abstraction

Water will be needed for concrete during construction work. Natural permanent watercourses may be used for this purpose. The construction activities for culverts and bridges around the

water course will impacts among others the quality and quantity of water flow to the downstream, mortality to aquatic species, destruction of the riverbank and associated vegetation, which local people might be quite affected environmentally and economically (source of water is support to their livelihood).

Water abstraction and disturbance will disturb aquatic habitats and fish in particular which some of the community used for food. However, due to the fact that most rivers/streams are seasonal with little base flow the impact is expected to be minor and controllable.

Impact significance

Regarding impact on hydraulic transparency, the intensity of the impact would be medium, the extent would be local as all culverts will be rehabilitated and the duration temporary. The significance of the impact would be minor.

Regarding impact on surface water quality, the intensity of the impact would be medium as construction works are often associated with an increase in turbidity in nearby watercourses, the extent would be local and the duration temporary. The significance of the impact would be minor.

Regarding risk of accidental spillage of oil and concrete wash water, the intensity of the impact would be medium, the extent punctual and the duration temporary. The construction activities for culverts and bridges around the water course will impacts among others the quality and quantity of water flow to the downstream, mortality to aquatic species, destruction of the riverbank and associated vegetation, which local people might be quite affected environmentally and economically (source of water is support to their livelihood). Impact significance would be moderate. It is however a risk with a low probability to take place.

Regarding impact on aquatic habitats, the intensity will be medium, since there are no major waterbodies in the project area and any watercourses disturbances will pose risks to community in downstream and aquatic habitats. Impact significance would be moderate and the duration temporary.

	Impact on hydraulic transparency from construction, modification of aquatic habitats from widening of culverts and impact on ecological continuity of aquatic habitat from culvert rehabilitation	**Impact on surface water quality during construction with expected increase of turbidity**	**Impact of accidental spillage of oil and concrete wash water on surface water quality**	**Disturbance of aquatic habitats fish from water abstraction**
Intensity	Medium	Medium	High	High
Extent	Local	Local	Punctual	Punctual
Duration	Temporary	Temporary	Temporary	Temporary
Significance	Minor	Minor	Moderate	Moderate
Occurrence probability	High probability	High probability	Risk (low probability)	Potential occurrence

Mitigation measures

When constructing bridges and replacing or widening culverts, the contractor shall:

- Work preferably during the dry season. If it is not possible, installation of pumps or temporary diversions shall allow water to flow downstream of work. This is also key to avoid all impacts on downstream and upstream croplands that are dependent on water. Given the permanent presence of water in the box culverts, all work at these locations shall use diversion pumps and temporary enclosures to work in a dewatered environment. This measure is particularly important at locations where arched metal pipes will be fully replaced by larger box culverts and will therefore require interventions in the stream
- Contractor shall ensure the ESMP is prepared to include the soil erosion and aquatic management along the rivers and water courses to be crossed by the road project.
- For all works on arched metal culverts and box culverts the contractor shall develop in its Construction-ESMP, a method for water work to ensure that free flow of water is not impacted, that material is not deposited in the natural streams, and that turbidity of water does not increase.
- Undertake periodic monitoring site visit for water quality in all rivers to be affected by the road as per ESMP requirements during implementation.
- In case water quality is deteriorating or inadequate, water expert shall be put in place to take water sample for testing and develop mitigation measures that will prevent/avoid the water pollution that can cause risks to the aquatic species and downstream water users. Mitigation measures can be of correction and amelioration of identified negative impacts.
- During work on permanent streams (especially at box culverts), silt fences shall be installed downstream of work to avoid increasing turbidity of streams.
- Remove all obstacles to free water flow (rock, plant debris, waste) before replacement of culverts.
- All new culverts shall be installed partially under the riverbed level to avoid creating perched culverts (that would block free movement of fish) and shall not have a steep slope to avoid increasing flow to a point where some fishes can no longer swim
- Taking into account drainage and runoff flow patterns on the construction site is important to avoid local flooding or drought that could affect crops. Excavated material storage sites must never be done close to a watercourse to avoid impede the free flow of water or create bottlenecks. In order to minimize the impact of stocked material and spoils on water quality, the contractor will have to select storage sites that are far from any watercourses and wetlands.
- During replacement of culverts, the need for derivation roads shall be determined since replacement of corrugated metal pipe culvert will need to entirely open the road and this will require to remove asphalt and granular base course layer. If derivation road is necessary, they shall not ford cross the watercourses (even during the dry season) and the crossing shall use temporary culverts that are size to ensure free flow of water. Apartments at these temporary crossing shall be stabilized with geotextile membrane and riprap rocks.
- These measures shall be adopted and adapted in the Contractor's Erosion and Sediment Control Plan which is presented in the ESMP.
- Unnecessary clearance of land shall be avoided.
- Refueling of engines or transfer of materials should not be carried out near water bodies, and any local spillage shall immediately be remedied.

- When working close to watercourses, the contractor shall:
- Install silt fences upstream and downstream of work site to retain suspended solid.
- Install temporary slope stabilization measures during construction such as sediment diverting or catchment basins.
- Regarding the risk of oil spills, all machinery working close to a waterbody shall have certified emergency spills containment which include silt floating and oil spill containment booms. A skimmer to suck up the contained spill shall also be foreseen on site. In case of minor spills, the contained waterborne spills shall be sucked with a skimmer up to remove the oil from water. The collected oil shall be sent to a treatment facility and shall not be discharged on soil.
    - An Emergency Preparedness and Response Plan (EPRP) shall be developed by contractor to prevent and address minor and major spills, which would require to mobilize necessary resource to maintain and clean the spill.
    - The contractor is required to avoid all discharge of concrete wash water in waterbodies or on the ground. Temporary washout containers shall be installed to allow wash water to evaporate. The hardened cementitious solids could then be recycled.
    - When removing wing walls, machinery shall not work from the stream and shall avoid all encroachment. The culvert embankment shall be rapidly stabilized upstream and downstream with riprap or gabion in addition to the new wingwall to avoid leaving bare soil and erosion of the banks.
    - At the campsite, grey water or wastewater shall never be discharged in a natural waterbody but be collected in skeptic tanks to avoid discharge in natural ditches and in watercourses.
    - The contractor shall obtain a water right before any abstraction of construction water in the project area.
    - Regardless of their suitability for water, small streams shall be avoided due to little base flow. Abstraction would have severe impact on aquatic habitats because of their size and the size of their watershed.

Residual impact

With the implementation of preventive, mitigation and remedial measures all impact intensity and significance would be downgraded. Impact significance would be negligible to minor.

iv. Impact on noise level

The following impact was identified in the impact identification matrix. The noises were identifying along all the major centers and villages along the road. Increase in noise level and vibration. All construction activities will generate noise, some activities will be particularly noise such as removal of existing bituminous seal and truck transport. Blasting at quarries will also locally and significantly increase noise level.

Impact significance

Typically, equipment and construction machines are emitting average noise levels between 55 and 60 dBA which is quite an important increase of noise is not well operated and follow the manufactures manuals. The intensity would be high, punctual and temporary. Increased noise level would impact workers and communities along the road.

	Increase in noise level and vibration
Intensity	High
Extent	Punctual
Duration	Temporary
Significance	Moderate
Occurrence probability	High probability

Mitigation measures

When working close to residential areas, work shall be undertaken during daytime only.

- The use of machinery shall be done in a manner to avoid unnecessary noise. The contractors and operator of machinery and trucks shall avoid idling the engines. Machinery shall also be serviced regularly to avoid unnecessary noise and air pollution.
- The use of certified absorbent noise barrier to limit nuisances for nearby communities is recommended whenever possible. Such noise barriers could be used around generators and stationary engines.
- Through the Stakeholder Engagement Plan, TANROADS and the contractor shall communicate the schedule and duration of work to affected communities and at location where there are sensitive receptors (such as schools, hospitals and places of worship). If needed, schedule of work could be adapted based on collected feedback and close to these sensitive receptors.
- A list of criteria for the selection of quarries and borrow areas is developed and included in the ESMP, as several factors must be weighed such as the distance to transport material, the length of the access road to create, the presence of sensitive habitat and wildlife and the safety risk to persons (see the Environmental and Social Check List for all additional land requirement (quarry/borrow areas, workers camps, work sites).

Residual impact

With the implementation of mitigation measures, intensity of the impact would be reduced to moderate and the significance to minor.

v. Impact on air quality

The following impact was identified in the impact identification matrix and this impact is found along the road project.

Emission of air pollutants from machinery and trucks. Machinery and trucks will emit air pollutants such as CO2, CO, nitrogen oxide (NOx), PM10, PM2.5 (dust in the form of particulate matter), and SO2. Trucks and construction machines are high NOx emitters.

Asphalt manufacturing also emits gaseous emissions and borrow areas and quarries will generate particulate matter (dust).

Impact significance

With the presence of machinery, air pollution from engines and from the generation of dust will increase quite significantly the concentration of pollutants. The intensity will be medium, of punctual extend and temporary duration.

	Emission of air pollutants from machinery and trucks
Intensity	Medium
Extent	Punctual
Duration	Temporary
Significance	Minor
Occurrence probability	High probability

Mitigation measures

- *Dust from work sites in village and town centers shall be reduced. This includes spraying the access to the construction site and other off-site facilities (quarries). The frequency of sprinkling shall be increased during the dry season. The use of water to suppress dust shall not be done at the expense of sensitive aquatic habitats and sources of domestic water. Location for water abstraction shall be validated by the Supervising engineer. The use of oil and oil by-products is prohibited to control road dust. Dust emissions from processing equipment at quarries (e.g., crushers, grinders, screens) shall also be adequately controlled through dust collectors, wet processing, or water spraying.*
- *Vehicles maintenance: vehicles and trucks will be verified and serviced on a regular basis, especially oil changes in vehicles, truck and machinery to avoid unnecessary air pollution from exhausts.*
- *All trucks transporting material shall be covered (including trucks travelling to and from quarries and borrow areas).*
- *The selection of the asphalt batch plant location shall be done in consultation among TANROADS, local government authorities, customary authorities, and the contractor to ensure that it does not lead to local nuisances. It shall be located at a suitable distance from households.*

Residual impact

The implementation of mitigation measures will reduce the intensity to low, impact significance will remain minor.

vi. Impacts to Biodiversity" (Impact on terrestrial habitats and associated flora)

The following biodiversity impacts were identified in the impact identification matrix. ***Loss of roadside terrestrial habitat.*** Road widening, storage of spoil material and work sites will require land and may impact terrestrial habitats and wetlands. Roadside verges are often valuable habitats for small animal species. Other project activities such as the creation of arrester beds, geometry changes will also require land clearing and may impact roadside terrestrial habitats.

Destruction or disturbance of terrestrial habitats (Miombo and shrubs) at raw material extraction sites and off-site facilities (workers camps, stone crushing sites, etc.).

Borrow areas, hard stone quarries sand pits may affect natural habitats or lead to their destruction. All additional land requirement such as land for the campsites and land for the stone crushing site may lead to destruction of disturbance of habitats. The Detailed design has pre-selected several borrow areas and hard stone quarries. Sand pits, campsites and stone crushing sites were not localized.

Impact significance

Loss of roadside terrestrial wetland habitats.

Currently, the road reserve is most of the time already set aside and artificialized with laterite cover. Road widening will take place in this road reserve as shown in the two following

figures. Loss of roadside terrestrial habitats from road widening will therefore be minimal. Loss will occur whenever additional land will be required for work sites and storage of spoils, arrester beds and minor changes in geometry. This may affect small wetlands that are located close to waterbodies. At this stage, the surface of losses is not possible to assess, as most road reserve are already artificialized, but the total surface is expected to be very small. For example, the 7 arrester beds will require about a total of 2.5 ha of land. The intensity of the impact would be low, extent punctual and duration permanent. The significance of the impact would be minor.

Destruction or disturbance of habitats and wetland habitats at raw material extraction sites and off-site facilities.

Using existing quarries is less impacting than opening new quarries. However, both situations will lead to destruction of habitats forests and disturbances of habitat. At this stage it is not possible to determine the surface of impacted habitat.

At quarry and sand pit sites, in addition to altering the landscape and creating hazardous condition for people. Impacts on natural habitat and biodiversity from earth grabbing and cutting, blasting noise and truck movement, contamination of groundwater, impact on watercourses, removal of vegetation cover, mortality of less mobile species. The impact intensity would be medium, the extent would be local (as many sites will be impacted) and the duration permanent. Impact significance would moderate.

	Loss of roadside terrestrial and wetland habitats	**Destruction or disturbance of habitats and natural habitats (alongside trees) at raw material extraction sites and off-site facilities**
Intensity	Low	Medium
Extent	Punctual	Local
Duration	Permanent	Permanent
Significance	Minor	Moderate
Occurrence probability	High probability	High probability

Mitigation measures

- Work and storage of spoils and machinery shall remain within the existing road reserve.
- Return of experience has shown that it is key for contractors to commit to maintaining all works within set boundaries to avoid unnecessary impact on habitats.
- The contractor shall build on international good practices to mitigate the impacts of the works on environment, including the use of optimized drainage systems to ensure that all culverts, bridges, and crossings are adapted for biodiversity.
- As work progresses, the Supervising engineer shall clearly delineate on the field the worksite and communicate the limits to the contractor.
- In order to limit all work within set boundaries, and to manage off-site impacts, the contractor shall request the Supervising engineer whenever additional land is temporarily required along the road.

- Once exact locations of quarries and borrow areas are known, The Quarry and Borrow Pits Management and Restoration Plan shall be prepared and implemented, this shall include the Biodiversity Management Plan that among others, shall include the Restoration Plan based on native vegetation to be implemented at the end of the works
- At the end of quarry and borrow areas operation, the contractor shall commit to reinstate them to minimize any ongoing impacts on habitats as per approved Borrow pits Management and Restoration Plan.
- The restoration shall include removing all unnecessary rubble and removing all machinery and oil barrels and softening the slopes of quarry of borrow areas. Consultation with local authorities, shall be done to determine the fate of disused borrow areas. For example, borrow areas can be filled with unusable soil to reduce their depth or could be transformed into wetlands or livestock drinking ponds where appropriate *(as requested during public consultations)*. Planting trees around the borrow area is also recommended to stabilize the slopes and avoid further erosion.

Residual impact

Loss of roadside terrestrial and wetland habitats will remain minor and impact from the destruction or disturbance of habitats at raw material extraction sites and off-site facilities will be downgraded to minor significance.

Biodiversity impacts on alien and invasive plant species

Risk of spread of alien and invasive plant species. Land clearing and earth work to increase the road width may facilitate the spread of invasive species. As presented in the baseline on invasive and alien species.

Impact significance

Since work will mainly take place along an existing infrastructure, the intensity of the impact is low, the extent would be punctual and the duration permanent (if alien species would settle in an area, the effect would be permanent or at least long lasting).

	Risk of spread of alien and invasive plant species
Intensity	Low
Extent	Punctual
Duration	Permanent
Significance	Minor
Occurrence probability	Risk (low probability)

Mitigation measures

While identification of all invasive plants will not be feasible during land clearing to accommodate work sites, other mitigations can be proposed. It is for example, recommended to ensure that machinery be cleaned and verified before commencement of work to ensure that no mud is transported to the site. Cleaning machinery shall also be performed when working close to watercourses. Lastly, all earth spoils shall be rapidly reused or covered to avoid colonization by invasive plants.

Residual impact

With appropriate preventive measures, the risk would not be completed annihilated and would remain of minor significance.

Impact on the human environment during construction phase (road widening/rehabilitation)

Possible additional temporary and permanent restrictions on land use during construction. Road widening, construction of bridges, Culvert replacement and diversion roads may require additional land to accommodate the intended works activities. This additional land will require the relocation of affected properties and livelihood of the people, socioeconomic and psycho-social impacts on displaced persons, hence compensation is inevitable. Temporary and permanent land restrictions on land use is therefore expected during construction.

Impact significance

Given that some additional land may be required during construction and that the willing buyer, willing seller principle would prevail, hence all properties within the construction corridor of 45m and 60m specified road sections shall be compensated. The impact intensity would be low, the extent would be punctual, and the duration would be temporary (for temporary land requirements) or permanent. Impact significance would either be minor or negligible.

Regarding socioeconomic impacts on displaced persons, after compensation measures payment and livelihood restoration measures, the intensity of the impact would be low, the extent local (as land may be required all along the road) and the impact would be temporary.

	Possible additional temporary and permanent restrictions on land use during construction	**Socioeconomic impacts on displaced persons**
Intensity	Low	Low
Extent	Punctual	Local
Duration	Temporary/permanent	Temporary
Significance	Minor or negligible	Minor
Occurrence probability	High probability	Potential occurrence

Avoidance and mitigation measures

According to the RAP, the willing buyer/willing seller (wb/ws) approach applies only where landowners can freely refuse the sale without any fear of compulsory acquisition, and where compensation reflects fair market value. Because the transaction is fully voluntary, wb/ws operates outside the RAP framework and is not considered involuntary resettlement.

Residual impact

With the implementation of mitigation measures, the residual impact would be negligible. Some persons may even benefit from the project activities process. Regarding socioeconomic impacts on displaced persons, the significance of residual impact would be minor.

vii. Impact on social indicators

The following impacts and risks were identified in the impact identification matrix:

Worker's influx, Contractor campsite and associated social impacts on communities. The setting up of contractor campsites and mobilization of workers are associated with multiple risks from labor influx for host communities including risk of OHS i.e HIV/AIDS and communicable diseases, compensation packages, GBV/SEA related to gender inferiority and dominance among the community, hence the women and children are the mostly affected group. However, the establishment of temporally campsites which found to be suitable for project, poses the social risks to the host community in term of HIV/AIDS and communicable diseases, GBV/SEA risks and therefore the main risk of typical impacts will be from the arrival of workers. Other Impacts and risks for community members are numerous and can range from:

- Social conflicts.
- Increase in crime and feelings of insecurity.
- Changing social dynamics.
- Pressure on local public services (see this section).
- Increase in communicable diseases amongst workers and outbreaks in host communities
- Increase in gender-based violence (GBV) including segregation, social conflicts, and prostitution acts among the community.
- Child labor and impacts on their education (in canteens and house cleaning).
- Price inflation of local goods and services and rents having a more severe impact on people not employed by the project.
- Increase in road traffic and collisions and accidents with pedestrians.
- Construction-related nuisances: noise, poorly managed waste, dust, wastewater discharge in natural watercourses without any treatment.

The selection of contractor's campsite along the road shall consider the following key guideline as follows.

- What will be the alternative use of the campsite, the buildings can be used for social services (such as schools) since there is a good population.
- Availability of manpower along the area.
- It is neither within nor near environmental sensitive area.
- Already disturbed area due to human activities.
- Availability of power, water and dispensary within the area.
- Strain on local services such as health services, water supply, waste management and electricity from the presence of work and workers. The setting up of campsites and mobilization of workers may strain local services and public utilities. This includes water and electricity from TANESCO National power grid.

Impact significance

Overall, the social impact associated with workers' influx would be of medium intensity, the extent would be local and of temporary duration. However, regarding some indirect impacts such as GBV and SEA, the intensity would be high. As presented above, the associated risks are presented in this ESIA accordingly.

Regarding potential strain on local services, the intensity will be medium, the extent will be local as it may impact several services and the duration will be temporary.

	Worker's influx, workers camp and associated social impacts on communities	**Strain on local services such as health services, water supply, waste management and electricity from the presence of work and workers**
Intensity	Medium	Medium
Extent	Local	Local
Duration	Temporary	Temporary
Significance	Minor	Minor
Occurrence probability	Potential occurrence	Potential occurrence

Mitigation measures

- The project will select campsite's locations through collaboration and consultation between TANROADS, local government authority, customary authorities and contractor to minimize any possible environmental and social risks to communities and biodiversity along the road. Workers lodging planning must be done in a way that reduces interaction with local communities. As a good practice, it is recommended to install the campsites as far as possible from villages centers.

- TANROADS will need to ensure that effective consultations and information disclosure are held on a regular basis with local communities concerned by the proposed campsite. The E&S framework such as RPF, LMP, SEP and GRMs and the GBV action plan will help to provide guideline to specific Contractor E&S tools that provide the mitigation and prevention of project related risks associated with location of the campsites.
- A workers' Code of Conduct shall be enforced to ensure that all workers behave in a respectful manner and to avoid all conflicts with local communities and GBV. The CoC is presented in the ESMP and in the GBV action plan. The GBV action plan shall be put in place and enforced, with induction training and sensitization for all workers (including unskilled workers).
- The Contractors campsites shall include wastes collection and management points for both solid and liquid wastes as per project waste Management Plan (WMP). The collection and waste disposal will be undertaken by the authorized wastes collection dealer for disposal (other mitigations regarding wastes management are presented at

chapter 2 and 6). A Waste material Management Plan shall be presented as part of the C-ESMP.

- The contractor shall adopt and implement Labor Management Plan based on the guidance presented in the ESMP and ESMF and the requirements of section 2.1 General Facility Design and Operation of the General EHS Guidelines from the WBG.
- The establishment of campsites shall not lead to pressure on public services such as drinking water, electricity and health care, as these pressures are often to the detriment of local communities. Regarding the need to limit the strain on local services, it is recommended to disclose to local public services the needs generated by the campsites and the construction site and coordinate the implementation of measures to prevent pressures on public infrastructure from having negative consequences on local communities (hospitals, roads, electricity consumption, and water intake). The construction contractor will have to study these risks and will have to set up its own services such as a first aid center and source of water. TANROADS will have to liaise with TANESCO National power grid to ensure that electricity demands for the workers camp do not lead to power outages. If needed, the contractor will have to produce its own electricity using generators.
- During construction, water pipes, electricity poles, gas pipes and TTCL cables located in/crossing the right of way (road reserve) may be moved slightly away from the road with provision of service duct to avoid interruption of services. TANROADS in collaboration with utility companies (TANESCO and TTCL) will be responsible for relocation of utilities and this will be done before commencement of construction works. Districts Water Engineers for shall be involved from the early stages. Utility Authorities should be notified in a timely manner and commit to restore the service after construction works. If temporary closure of water utilities is unavoidable, early notice shall be given to the community before removal and relocation of water utilities and alternative temporary domestic water supply shall be established.

Residual impact

With the implementation of preventive and mitigation measures, impact intensity would be reduced from medium to low. Impact significance would be minor for both impacts.

viii. Impact on livelihood and economic activities

The following impacts and risks were identified in the impact identification matrix.

- Disturbances to livelihood and economic activities such as street vendors, petty traders and businesses along the road and other road users may be impacted on their daily life by removing them out of the ROW and changing road conditions during construction activities and restrictions of access to businesses and other related road usage.
- Disturbance of local traffic, mobility and congestion impacting economic activities. Road users and commuters going to work may be impacted by changing road conditions during construction activities.

- Disturbance of rivers and natural water flow along several rivers traversed by the road project as well as other water sources from local well, boreholes under water community may be impacted. The water uses and abstraction for construction activities from these sources may lead to impact on social economic and environmental aspect to community along the road project.
- Road accident from moving vehicles that can cause death or injury and disturbance of local traffic, mobility and congestion impacting along major centers, schools' areas and other social amenities along the road.
- Construction activities represent an opportunity for temporary employment for members of local communities. Semi-skilled and unskilled labor will be sourced locally to provide communities with employment and the opportunity to earn an income during the construction phase of the proposed project. The contractor will engage nearby local communities in performing various construction activities that do not require specialized skills.

Impact significance

Regarding disturbances to livelihood and economic activities and disturbance of local traffic, the intensity of the impacts would be medium, the extent will be local as these impacts may be felt at several locations along the road, and the duration would be temporary. The impact significance would be minor.

Regarding natural water disturbances from rivers crossing the road, the construction activities may affect river flow as well as local well, boreholes under water community and natural springs. The intensity could be high, jeopardizing the use of water for downstream users. The impact would be local and temporary. The significance would be moderate. Given the uncertainties regarding the ecosystem services that people draw from the rivers and natural water flow, the probability of occurrence is potential.

Regarding job opportunities, local employments are expected during construction. The intensity of the positive impact will be medium, of punctual extent and temporary duration (since local employment will only be provided during widening/rehabilitation work).

	Disturbances to livelihood and economic activities	**Disturbance of local traffic, mobility and congestion impacting economic activities**	**Reduction of available water used for irrigation**	**Job opportunities**
Intensity	Medium	Medium	High	Medium

Extent	Local	Local	Local	Local
Duration	Temporary	Temporary	Temporary	Temporary
Significance	Minor	Minor	Moderate	Minor
Occurrence probability	High probability	High probability	Potential occurrence	High probability

Mitigation and enhancement measures

Compensation package to the PAPs is among the livelihood support to the affected communities as presented in the RAP which is prepared as part of this ESIA. This compensation is design to offset the losses of income to PAPs during construction work along the road. The Design report has included the provisions to construct and improve existing, road geometric, truck bays, climbing lanes, Busways which mostly should be implemented to the major villages and centers along the road. It is however expected that once construction work will be over, the petty traders and vendor will have an opportunity to work along the road within the conducive environment that considering the safety to all road users.

The standalone RAP has been prepared and provide more details on measures to assist affected persons to restore their livelihood along the road. All vendors and petty traders shall be maintained to alternative site identified by the local authority to avoid reducing their source of income during the construction.

A Traffic Management Plan shall be developed by the contractor to minimize impact on road traffic and accident.

Enhancement measures for job opportunities include:

- Hiring members of local communities is one of the most common expectations when large infrastructure projects are developed.
- Job offers shall prioritize permanent residents of neighboring communities. The local residency must be certified by the customary and local authorities before any hiring process and to avoid influxes from outsiders. Quotas for hiring local people must be negotiated with these authorities based on the number of habitants per neighboring community. This would require that the contractor identifies the needs and determine which jobs can be captured by local residents.
- An off-site recruitment center should be set up. It will have to register all types of job applications from unskilled jobs to skilled jobs.
- The contractor shall strive to source materials, equipment and services that can be provided by local suppliers. This will enhance internal money circulation and growth of business in the trading centers along the road, both districts and the region at large. TANROADS is also encouraged to procure experienced local contractor and sub-contractors.
- A special clause that requires local residents to be employed as workers during construction shall be included in the contract. Furthermore, the contractor shall assist and permit small businesses that support the construction such as cafes, food vendors,

kiosk etc. to provide services to the construction staff in consultation with the local government authority.

Residual impact

The intensity of the disturbances to livelihood and economic activities and disturbance of local traffic, mobility and congestion will reduce from medium to low. Residual impact would remain of minor significance. The impact significance would be reduced to minor.

The proposed enhancement measures would ensure that job opportunities are given to local members of the communities, but the intensity would likely remain medium. The significance of the positive impact would remain minor.

ix. Impact on community use of the road and safety aspects along the road and around the construction materials sources

- The following impacts and risks were identified in the impact identification matrix. Impact on connectivity across the road and disruption of access to social and economic activities. Construction activities will affect connectivity across villages, township and major centers along the road as most have developed on both sides of the road. Works will disrupt regular pathways and walking routes pedestrians walk every day. This may cause frustrations due to restrictions of access to homes, services, schools or locations of work during construction.
- Health and safety risks for communities during construction. Nuisances (noise, dust, odors, presence of spoil materials) and risk of collision during construction activities may affect health and safety of people. Community members using the road, and particularly vulnerable road users such as pedestrians and bicyclists, are particularly at risk. Safety risks from induced traffic on smaller village roads (when trucks and vehicles avoid congestion from construction work) is also a typical issue to foresee. Lastly, all borrow areas and quarries represent important safety risk for workers and community members.

Impact significance

Regarding impact on connectivity across the road and disruption of access, the intensity will be medium, impact extent would be punctual and duration temporary. The significance of the impact would be minor.

Generally, the direct impact on health due to nuisances during construction would concern about communities live along the project road. Regarding safety risks for communities during construction, in case of a collision with a pedestrian or a bicyclist, the intensity of the impact would vary from low to high depending on the severity of the accident, the extent would be punctual, and the consequences could be permanent. The significance of the impact would vary from minor to major. The risk has a low probability to take place.

	Impact on connectivity across the road and disruption of access	Health and safety risks for communities during construction	Risk of improper behavior of security personnel
Intensity	Medium	Low to High	Medium
Extent	Punctual	Punctual	Punctual
Duration	Temporary	Permanent	Temporary
Significance	Minor	Vary from minor to major	Minor
Occurrence probability	High probability	Risk (low probability	Risk (low probability)

Mitigation measures

- Drastically reducing of speed close or in the work sites, is the most important mitigation to implement to ensure safety of community and workers.
- The construction contractors shall ensure safe passage at identified crossing sites for pedestrians with appropriate signage using pictograms and adequate protection from work engines and trucks and motorized traffic indicating diversion and entrance.
- Pedestrian crossings shall be separated from motorized vehicles crossings and shall be installed away from hazards. These shall be physically separated with barricades and construction fences to inhibit pedestrian movement into the work site. The construction contractor shall perform routine inspection of construction fences to ensure that they have not fallen or been stolen.
- All passages shall be universally accessible to allow people with physical disabilities to safely cross (using a wheelchair for example)
- Work site shall be clearly delineated and create exclusion zones. Work shall be confined to avoid that dangers spill out onto the sidewalks and streets around.
- Providing and install the signage indicating danger using pictograms around the borrow pits and quarry areas.
- Provide marking and signpost to offsite auxiliary facilities *(borrow pits, quarries, etc.)* indicating potential hazards and prohibiting access to unauthorized personnel's.
- Construction fences and work exclusion zones shall be visible at night, it is therefore required to use orange, fluorescent color for barricades and fences.
- The mobilization of a traffic controller is key, this traffic controller shall ensure to allow pedestrians to cross at designated locations.
- Appropriate traffic control signs shall be installed along the main road, along detours. The contractor shall collaborate with Police force in monitoring vehicles and drivers' behaviors.
- Mitigation for spoil materials include the need to confine land clearance within the proposed new road reserve boundaries and the need to avoid stockpiling materials close to pedestrian paths or close to residential areas and sensitive receptors schools.
- Sensitization at schools along the road is also necessary, to show typical dangers associated with construction work and typical work signage to children (including the danger associated with arrester beds, quarry and borrow area operation). This activity shall be done in the framework of the SEP.

- Mitigation and preventive measures for safe pedestrian passage shall be included in the Traffic Management Plan which shall be developed prior to construction by the contractor as part of the Construction-ESMP.
- Road safety awareness campaign shall be conducted by contractor and destined at all workers during construction activities. In addition to regular OHS training for workers, awareness shall focus on ensuring community safety from work.
- Regarding the risks associated with security issues around the campsite personnel, there will be campsite management plan that contain the Code of Ethical Conduct and LMP to manage risks related to safety along the project.
- Contract shall include behavior commitments and clear and accessible disciplinary process. As highlighted in the World Bank Good Practice Note Assessing and Managing the Risks and Impacts of the Use of Security Personnel "Although security is often sub-contracted, ultimately, the Borrower is responsible for the commitments made on the project. Contracts should include clear commitments regarding a Code of Conduct, training of proposed private security personnel and vetting of their record, as well as security procedures in case of alleged contract or Code of Conduct violations, including for cases where security personnel use excessive force, intimidation, or retaliation; and a summary of sanctions applicable".
- Security personnel shall be required to sign the Workers Code of Conduct and shall take part of induction training and sensitization on the Code of Conduct, the GBV action plan and the GRM. In addition, security personnel shall receive procedural training on procedures, proper conduct and ethics and human rights.
- It is recommended to use guards from recognized private security companies and with a good reputation.
- The DIST-SEP includes an overarching GRM which shall be adapted for each project by TANROADS to ensure rapid resolution of grievances. The GRM shall be accessible to community members who wish to file a complaint regarding security personnel and workers behavior. Clear and transparent process for allegations of abuse is developed in the overarching GRM. As a good practice, it is recommended that the Supervising engineer, in close collaboration with TANROADS and the construction contractor adapt the overarching GRM based on project context.
- Security-related allegations or incidents can include issues such as theft, abuse of power and retaliation, sexual harassment and exploitation, gender-based violence, and bribery and corruption shall be investigated by the Supervising engineer and TANROADS, for criminal cases, the police shall be involved. For cases of gender-based violence, the World Bank must be alerted immediately.
- Additional measures are presented in the DIST-GBV action plan.
- Temporary access to businesses during construction shall be planned and negotiated by TANROADS in consultation with affected business owners, with the contractor responsible for implementing the agreed access arrangements. Where temporary access restrictions cause economic disturbance, TANROADS will assess the magnitude of economic impacts using a clear methodology and apply specific mitigation and compensation measures outlined in the RAP addendum.

- Lastly, the Environmental and Social Check List for all additional land requirement *(quarry/borrow areas, campsite, work sites)* presented in the ESMP includes requirements to assess the proximity of borrow areas and quarries with settlements to ensure that these sites do not lead to safety hazards.

Residual impact

With the implementation of preventive measures, the probability of occurrence will be further reduced for all risks. Regarding the impact on connectivity across the road and disruption of access, the intensity will be reduced to low. Impact significance would remain minor.

Impacts on women

The following risk was identified in the impact identification matrix:

Risk of additional workload burden on women when men are hired for construction work. Construction work may attract men to work leaving women with additional burdens.

Impact significance

Intensity of the impact would be medium; the extent would be local and duration temporary. Impact significance would be minor.

	Risk of additional workload burden on women when men are hired for construction work
Intensity	Medium
Extent	Local
Duration	Temporary
Significance	Minor
Occurrence probability	Potential occurrence

Mitigation measures

This impact is hardly immitigable as recruitment of workers will not be able to detect this risk and select workers based on their family status.

Residual impact

Residual impact would remain minor.

x. Impact on vulnerable groups/persons

The following risk was identified in the impact identification matrix and at Chain age. Disturbance of persons living with disabilities due to loss of access during construction work. Persons living with disabilities may find it difficult to use the road and access services during construction activities. The ESIA study, revered that along the road there is no vulnerable group that qualify to the WB ESS-7 requirements on vulnerable groups, hence, in case this community will be found during the road construction, then the ESS- 7 shall be applied. The issues of Universal access to the road and walkways shall be among, the issue to include the pedestrian walkways will be developed in villages; this will improve universal access to persons living with disabilities.

Impact significance

It is difficult to assess the impact since no specific grievances on this topic were collected during engagement activities. However, it is expected to be of low intensity, local extent and permanent.

	Disturbance of persons living with disabilities due to loss of access during construction work
Intensity	Low
Extent	Local
Duration	Temporary
Significance	Minor
Occurrence probability	Potential occurrence

Mitigation measures

All temporary passages across work sites shall be universally accessible to persons living with disabilities as presented in this ESIA.

Residual impact

With the implementation of mitigation measures, impact significance will be nil.

	Universal access to the road and walkways
Intensity	Low
Extent	Local
Duration	Permanent
Significance	Minor+
Occurrence probability	High probability+

Enhancement measures

The main enhancement measure is the development of additional walkways in selected villages as recommended in this ESIA. In case any issue is raised during engagement activities at project implementation, additional and dedicated enhancement could be developed.

xi. Impact on HIV and AIDS situation

The following risk was identified in the impact identification matrix. The arrival of workers in the project site is often associated with an increase in HIV prevalence.

The spread of HIV/AIDS is a serious concern whenever road project is taking place, the risks is very high around the major centers and villages as well as campsites due to community mingling that associated with informal partner relationship. This could be aggravated by influx of job seekers and workers and sexual relationships between incomers and local people. GBV and SEA are also associated with an increase in HIV and STI and communicable diseases.

During engagement activities, community members at the project area raised their concerned about the influx of people into the area including construction workers. According to District reports, HIV infections and AIDS epidemic are a threat to the population in terms of social, well-being and economic development in the district. Public consultative meetings confirmed this fact, whereby it was asserted that the road project could contribute to accelerate the spread of new HIV infections.

This impact can also be associated with the establishment of contractor campsite along the project as the campsite attract number of people and facilitate mingling with the communities.

Impact significance

The spread of HIV is a significant risk on construction sites. In case of infection of a person, the intensity of the impact would be high and of permanent duration. The extent of the impact would be regional as it could affect all persons living along the road or in contact with a person that has worked along the road.

	Spread of HIV
Intensity	High
Extent	Regional
Duration	Permanent
Significance	Major
Occurrence probability	Risk (low probability)

Mitigation measures

Raising awareness of the risks of sexually transmitted diseases shall be part of mandatory recruitment training for workers. For this purpose, the contractor shall prepare and implement an HIV/AIDS awareness campaign to reduce risks of spreading of HIV/AIDS and other STDs. All workers shall receive an induction training on this issue. The contractor shall also identify a registered service provider to test workers.

TANROADS shall require the assistance of NGO to implement HIV/AIDS awareness campaigns.

Access to Contractor's Campsites shall be well managed through well prepared labour management, public awareness campaign to control workers influx along the road. The contracted HIV/AIDS service providers shall be put in place to promote safe sex, sensitize workers on regular testing and shall provide information on the nearest health center to get tested.

Contractor shall provide standard quality condoms to personnel on site.

Residual impact

With the implementation of preventive measures, the probability of occurrence of the risk will be further reduced.

xii. Impact on child labor and forced labor

The following risk was identified in the impact identification matrix:

Risk of child and forced labor. Construction activities, the presence of contractor's campsites, involvement of primary suppliers in the chain of goods and services, and workers engaged through third parties (such as subcontractors, brokers, agents, and intermediaries). The ESIA study revered that there will be no risk of forced and child labor. From previous similar road projects, there is no evidence of child labor and forced labor in Tanzania due to applicable control mechanism such as labor related Law and LMP which are used for recruitment procedures.

Impact significance

Child and forced labor have severe impacts on the victim. As for all risks that may affect the physical or emotional integrity of persons, such cases are not anticipated along the road. The extent would be local as the project puts in place the control mechanism to avoid such risks.

	Risk of child and forced labor
Intensity	High
Extent	Local
Duration	Long term or irreversible (permanent)
Significance	Major
Occurrence probability	Risk (low probability)

Mitigation measures

- Children under the age of 18 years shall not be hired on site as provided by Employment and Labor Relations Act, 2004 Part II Sub-part A Child Labor. This includes hiring children in any project facilities related to this project.
- The contractor shall verify all identification papers of all workers upon recruitment. In the absence of papers, customary authorities shall attest the age of the worker.
- The Supervising engineer shall understand local realities in terms of informal employment and understand the dynamics of informal employment in order to better identify the risks and abuses (forced labor, child labor, human trafficking). This includes the use of "brokers" or "intermediaries" that hire local workers. For this purpose, audits of workers conditions based on the Project Labor Management Procedures (LMP) shall be undertaken to verify workers' status.
- Understanding local dynamics of informal employment is also necessary to fight against GBV and against any activity contrary to the laws of the country and the principles set out in the conventions of the International Labour Organization (ILO). The workers GRM shall be accessible to all workers. Labor Management Procedures (LMP) has developed a framework approach for the workers' GRM. The contractor shall adopt and implement the Labor Management Procedures as well as Contractor C-ESMP.
- In case of suspicion or proven cases of abuse, the Supervising engineer must ensure that TANROADS and the World Bank be formally informed. Return of experience on construction sites has shown that often cases are only suspected. Because of that,

there is a lack of communication between the Supervising engineer and project implementing agencies which is often responsible for the inaction and the aggravation of these situations.

- The Supervising engineer shall conduct audits at quarry sites to ensure that no children and no forced labor are working in quarries. Auditing of primary suppliers is also required under ESS 2.
- In case of suspected cases of forced labor or child labor and human trafficking on construction sites or in supply chains, the Supervising engineer shall take remedial measures. In the event of discovery of child labor or forced labor or deplorable working conditions (unsafe working conditions, ill-treatment), the Supervising engineer must, in conjunction with the construction contractor, impose changes or change subcontractors or suppliers according to possible levers.

Residual impact

With the implementation of preventive measures, the probability of occurrence of the risk will be further reduced or annihilated.

xiii. Impacts on labor conditions

The following risks were identified in the impact identification matrix:

Risk of poor labor conditions due to high level of informality. Construction activities, involvement of primary suppliers in the chain of goods and services and workers engaged through third parties (such as subcontractors, brokers, agents, or intermediaries) represent risk of poor labor conditions.

OHS risks to workers. Workers will be at risks of accidents and injuries, and they may be exposed to health hazards due to stack dust and fugitive dust and exposure to fumes during road paving. Workers are also at risk of collision with vehicles and trucks circulating on the road during work.

Informal work includes jobs that are not properly registered, such as hiring a worker without a required employment contract or failing to make social payments. Casual labor is the hiring of workers without any job security, for example the use of day laborers who are chosen each morning or are intermittently employed.

Impact significance

- Risks of poor labor condition would be of medium intensity, local extent as it could affect all workers along the road and of temporary duration.
- Regarding OHS risk, on the worst case, a severe accident could be of high intensity, permanent in duration and of punctual extent. However, this is a risk with a low probability to take place. In other cases, such as a minor accident, the intensity would be low, and the significance would be minor.

	Risk of poor labor conditions due to high level	**OHS risks to workers**

	of informality	
Intensity	Medium	Low to High
Extent	Local	Punctual
Duration	Temporary	Permanent
Significance	Minor	Vary from minor to major
Occurrence probability	Potential occurrence	Risk (low probability)

Mitigation measures

Workers hired to carry out works in infrastructure projects should not be classified as community workers (as defined in ESS-2 and in the Labor Management Procedures, LMP, which was developed specifically for DIST but as contracted workers, even if targeted efforts are made to promote local hiring.

- The construction contractor shall maintain a data log of all workers and implement the procedures as set in the LMP. It is therefore required that the construction-ESMP to be developed by the construction contractor acknowledges and implement the procedures from the LMP when hiring workers, including workers from communities. The construction-ESMP shall develop procedures to ban any form of disguised employment, misclassification, informality or casual labor.
- The Supervising engineer shall audit payroll of the construction contractor(s) to ensure that no workers are hired informally.
- In order to prevent OHS risks, the following measures shall be implemented by the contractor:
- Ensuring work zone safety for construction workers at all times (use of protective barriers to shield workers from traffic vehicles in towns and village centers, use of traffic cones and barrels in rural areas, use of warning lights to avoid using flaggers).
- OHS induction training for all workers, topics to cover during training shall cover the requirements from the section 2.2 Communication and Training from the WBG Environmental, Health, and Safety General Guidelines, 2.0 Occupational Health and Safety.
- Mandatory PPE equipment for all workers (adapted to the type of work) this include fluorescent vest for all workers.
- Presence on site of a full time dedicated qualified Environmental, Social, Health and Safety (ESHS) Officer of the Contractor (under the contractor payroll).
- Development and implementation by the contractor of a hazard identification and risk assessment that addresses all activities, routine and non-routine. This shall be done by contractor prior to beginning of work and shall cover all inherent risks associated with the construction site.
- Development of protocols and procedures by the contractor to detect COVID outbreaks through regular testing and isolation measures to reduce workers and community exposure to communicable diseases. Protocols shall be compliant with the recommendations of the section 3.6 Disease Prevention from the WBG Environmental, Health, and Safety General Guidelines, 3.0 Community Health and Safety.

- Development of protocols and procedures by the contractor to respond to work related accidents.
- Presence of first aid kits on site and a dedicated vehicle to drive injured workers to the nearest hospital.
- Availability of drinking water on work sites for all workers.
- Any injury, accident or near miss shall be described in a medical report by the contractor and Supervising engineer within one week of the injury.
- Use of millers and pavers with exhaust ventilation systems and proper maintenance of such systems to limit workers exposure to crystalline silica (millers and grinders) and asphalt fumes (pavers).
- Monitoring and record-keeping activities, including audit procedures designed to verify and record the effectiveness of prevention and control of exposure to occupational hazards.

All campsite establishment shall comply with the recommendations from the section 2.1 General Facility Design and Operation from the WBG Environmental, Health, and Safety General Guidelines on section 2.0 for Occupational Health and Safety.

Residual impact

With the implementation of preventive measures, the probability of occurrence of the risks will be further reduced.

xiv. Impact on Gender-Based Violence prevalence

The following risk was identified in the impact identification matrix:

Risk of an increase in Gender-Based Violence. Worker's influx is often associated with risk of GBV and sexual harassment in the workplace. Women and girls from neighboring communities are particularly at risk.

Some of the contributing factors to GBV are likely to be aggravated due to the construction phase such as alcohol consumption amongst workers. Some of the pre-existing types of GBV are also likely to be exacerbated by the construction phase. For example, local return of experience shows that the presence of many male workers puts local women and girls at risk of sexual abuse and early marriage.

Impact significance

As for all risks that may affect the physical or emotional integrity of persons, such cases are of high intensity. In addition, the GBV risk for DIST has been rated "Substantial risks". Impact could be long-lasting and local (since the risk covers the entire road area).

	Risk of an increase in Gender-Based Violence
Intensity	High
Extent	Local
Duration	Permanent (long-lasting)
Significance	Major
Occurrence probability	Risk (low probability)

Preventive and mitigation measures

A GBV action plan is in place for the DIST (the GBV action plan is a standalone document that applies to all DIST projects). It contains a GBV-SEA and GRM plan and workers' Code of Conduct. It will be adopted and implemented for the Project by the Contractors in collaboration with TANROADS Project Implementation Team (PIT). Implementation of the GBV action plans will help prevent the risk and address cases of GBV. The Contractors and Supervising engineer staff and all contractors (including sub-contractors) shall be trained on responsibility and key issues by PIT. The training shall include:

- Induction training to all workers on the GBV action plan, its requirements and the Code of Conduct and the use of the GBV grievance redress mechanism. PIT will be responsible for oversight of grievance handling across all subproject sites, and will carefully monitor the status and effective referral of GBV/SEA/SH complaints. However, for grievances registered with grievance committees, contractors and subcontractors will be responsible for keeping records and reporting cases to PIT.
- Training of Supervising engineer and contractors by PIT to present the GBV action plan requirements for managers.
- PIT will conduct a GBV risk assessment and GBV mapping in the project area to inform risk mitigation strategies and update a GBV referral pathway. The Supervising engineer and the contractor (and sub-contractors) shall acknowledge the outcome of this risk assessment and integrate GBV/SEA risk management in their management system. For example, both the Supervising engineer and the contractor shall provide separate facilities for men and women and display signs, posters and pamphlets around/along the project site that signal to workers and the community that the project site is an area where GBV/SEA is prohibited and enforce the Code of Conduct for all workers. The code of conduct to be signed by all workers is provided in the ESMP.
- The contractor shall also adapt its Construction ESMP to address the risks and participate in the prevention of GBV and SEA.

Residual impact

With the implementation of preventive measures, the probability of occurrence will be further reduced.

xv. Risks on disruption antiquities and historical site

The site clearance and land grabbing on borrow pit and quarry site may lead into identifying the unique historical value that was buried or found underground. Also, during construction works, archaeological findings may be encountered and potentially damaged or disturbed. Culturally sensitive areas (where cultural practices occur) may become affected by both construction and operation works around borrow pits and quarry site. In term of the religious or cultural value amenities, the consultation revered that around the project areas there is no any properties that meets the WB ESS- 8 criteria that can be affected, hence no gravel identified to be among the relocated properties. In case of identifying any archaeological or culture, findings the Contractor shall put the chance find procedure as well as preparation of

Culture Heritage Management Plan (CHMP) shall be put in place as per ESCP of the DIST project

However, the ESIA study and RAP did not identify any historical, heritage, archaeological/cultural or religious site at the project area, hence no risks identified during the study, however in case such historical remaining will be identified during construction phase, then the ESS-8 and Chance finding procedure may apply accordingly.

The impact magnitude is rate very low since the project road is existing for a long time ago (less chances of findings), however, in case of historical remaining found then, the chance finding procedures shall be followed as per appendix 6. The sensitivity is low, hence insignificant impacts.

	Risk of disturbances and destruction to unknown cultural heritage sites
Intensity	Low to high
Extent	Punctual
Duration	Temporary or permanent
Significance	minor
Occurrence probability	Risk (low probability)

Mitigation Measures.

- Contractor shall ensure that site clearance and land grabbing on borrow pit and quarry site does not degrade the possibilities of unique historical value which was buried or found underground along the project. Due to uniqueness of the historical value the chance find procedure shall be put in place by the Contractor as per applicable Laws.
- In case the cultural heritage resource will be potentially affected by the project, Culture Heritage Management Plan (CHMP) shall be prepared by Contractor and implemented according with the ESCP of the DIST project.
- Contractor shall prepare chance find procedure as presented in of the report to be in place prior to the extraction of construction materials or earth works.
- If Contractor identified any valuable materials shall immediately report it to the Resident engineer and other procedures on change finding may follow.
- If Chance Finds Objects (CFO) are encountered, the following steps and reporting structure shall be followed by the contractor:
- The person or group who identified or exposed the artefact must cease all activity in the immediate vicinity of the site.

The identifier must immediately inform his/her supervisor of the discovery. The supervisor must ensure that the site is secured and control access.

Respect for the values of the local community, including their use of the sites for economic, religious, cultural, and spiritual purposes, as long as their actions do not affect the site's outstanding universal values. They should be assessed, observed, promoted and marketed, and should go together with raising awareness on the significance of ruins, intangible heritage, natural heritage, and other cultural values to be found along the road.

In accordance with the guidelines and principles of the Department of Antiquities, any construction near a historical, architectural, or cultural site should adhere to Chance Find procedures.

Residue Impact

With the implementation of mitigation measures, intensity of the impact would be reduced to low and the significance would remain minor.

xvi. Impacts and risks on biophysical components during road operation and maintenance

Some impacts, both negative and positive, will take place during road operation. However, these can be characterized as follow:

- Most impacts during operation are rather induced impacts since they will be associated with the induced increase of speed thanks to new road conditions rather than being directly associated with the road widening/rehabilitation. There is no direct cause-effect relationship between the road widening/rehabilitation and increase in traffic.
- Most negative impacts are related to potential slight aggravation of existing impacts rather than being new impacts.
- Most negative impacts are largely offset by the positive outcomes of the project.

Impact on soils, surface water and groundwater, aquatic habitats and fish

The following impacts were identified in the impact identification matrix:

- Accumulation of pollutants in roadsides. Drainage from the road will collect silt, oil and waste which will impact soil quality.
- Infiltration of pollutants from roadsides in groundwater. Collected pollutants may reach local groundwater and affect its quality.
- Impact on surface water quality from road traffic and surface runoffs. Increase of the width of the road will increase surface runoff from the road and therefore silt, oil and dirt transport to watercourses.
- Degradation of aquatic habitats from increase in road traffic and surface runoffs. Impact on surface water quality from road traffic and surface runoffs will in turn affect aquatic habitats and fish.
- In case water quality is deteriorating or inadequate, water expert shall be put in place to take water sample for testing and develop mitigation measures that will prevent/avoid the water pollution that can cause risks to the aquatic species and downstream water users. Mitigation measures can be of correction and amelioration of identified negative impacts.

Impact significance

The all impacts have the same significance, the intensity would be low given that the road is an existing infrastructure and that most effect would be caused by increase in traffic (which cannot be attributed to the road widening/rehabilitation), and the extent would be local and the impact permanent.

	Accumulation of pollutants in roadsides	Infiltration of pollutants from roadsides in groundwater	Impact on surface water quality from road traffic and surface runoffs	Degradation of aquatic habitats from increase in road traffic and surface runoffs
Intensity	Low	Low	Low	Low
Extent	Local	Local	Local	Local
Duration	Permanent	Permanent	Permanent	Permanent
Significance	Minor	Minor	Minor	Minor
Occurrence probability	High probability	High probability	High probability	High probability

Mitigation measures

Accumulation of pollutants such as silt, oil and waste in roadsides is a typical impact which can be mitigated with the following measures:

- Appropriate signage to truck drivers to avoid littering.
- The design has foreseen to install drains with erosion checks which will reduce the silt load in streams.
- TANROADS shall include as part of its maintenance plan, the removal of accumulated waste and silts in these drains and in culverts.
- Truck lay bays shall be equipped with garbage bins to collect domestic waste and waste collection at these bays shall be contracted to a service provider.

Residual impact

Mitigation measures will help to reduce the intensity of impacts. However, the significance of impacts will remain minor.

Impact on noise level

The following impact was identified in the impact identification matrix:

Noise from traffic and reduction of noise thanks to road improvement. The impacts is continuous as the road project is existing, hence the road traffic will continue to generate noise. However, improved road surface will reduce noise level to some extent within the acceptable limits.

Impact significance

It is difficult to quantify the changes of noise level along the road given the fact that several factors will influence the impact (increase in speed and fluidity of traffic). In township, mitaa, village centers, it is however expected that with the widening of the road, noise will slightly be far from the sensitive receptors since the road will be widened to dual carriageways, whereby the residential houses have been compensated and relocated.

It is expected that the intensity of impact that can be attributed to the road widening/rehabilitation will be negligible (because the increase of traffic cannot be directly attributed to the impact level along the road project), the impacts is temporary duration and local. Dust reduction will also most likely be negligible. The impact is both positive and negative.

	Noise from traffic and reduction of noise thanks to road improvement
Intensity	Negligible +/-
Extent	Local
Duration	Permanent
Significance	Negligible
Occurrence probability	High probability +/-

Mitigation/enhancement measures

Typical mitigations against high noise level such as noise barriers, insulation of houses, and use of road surface that generates less pavement will not be realistic in the Project context, especially in village centers.

Given the fact that the road is an existing infrastructure, the cause-effect relationship between a possible increase in noise level and the road widening/rehabilitation would be difficult to demonstrate if no baseline data collected. However, prior construction phase and as part of Contractor ESMP, the Noise monitoring shall be undertaken by Contractor to assess the applicable limits based on the baseline data of noise level prior to construction. This baseline assessment shall be done at several receptors' points such as health centers and schools from the road to establish a noise propagation map. The noise monitoring shall standards stipulated in the General EHS Guidelines for noise level as it can be found through: *https://www.ifc.org/en/insights-reports/2000/general-environmental-health-and-safety-guidelines.* The Noise impacts should not exceed limits as per IFC and national requirements of 55 dB daytime and 40 dB night time at the nearest receptor's location off-site. Given that the road is an existing infrastructure the threshold to use would be the maximum increase in background levels.

Residual impact

Given that this type of impact is difficult to mitigate, residual impact would remain negligible in most cases.

Impact on air quality

The following impact was identified in the impact identification matrix:

Impact on air quality from road traffic and reduction of dust thanks to road improvement. Road traffic will continue to generate air pollution. However, improved road surface will reduce dust emission.

Impact significance

An inevitable increase of air pollution is expected due to increase in traffic, but this cannot be attributed to the road widening/rehabilitation. Improved road surface will reduce dust emission. The intensity of this impact would therefore be negligible, the extent would be local and the duration permanent. The impact is both positive and negative

	Impact on air quality from road traffic and reduction of dust thanks to road improvement
Intensity	Negligible +/-
Extent	Local
Duration	Permanent
Significance	Negligible +
Occurrence probability	High probability +/-

Mitigation/enhancement measures

One mitigation/enhancement measure would be to reduce the speed of vehicles in village centers to range 30 to 50 km/hour as required in the Road Safety Screening and Appraisal Tool (RSSAT).

Residual impact

Speed reduction will have limited effect on overall increase in air pollution from truck traffic. Residual impact would remain negligible.

xvii. Impact of road accident to road users and animal (Livestock) roadkill

The following impact and risk were identified in the impact identification matrix. The several major junctions, centers, villages can be identified to be prone to road accident and few of them to have livestock animals along the road. The road project will bring the possibility of accident occurrence to road users and animal kills from (traffic movements). Roadkill may be due to road speed due to road improvement, poor road signs, poor road geometric, road marking as well as poor road safety awareness to road users which requires the remedial measures to mitigate.

Impact significance

For both impacts, the intensity of the impact would be medium since the road is an existing road project, the extent local as all areas along the road could be impacted, and the duration permanent.

	Higher risk of livestock roadkill.	**Exacerbation of the barrier effect**
Intensity	Medium	Medium
Extent	Local	Local
Duration	Permanent	Permanent
Significance	Moderate	Moderate
Occurrence probability	Potential occurrence	Potential occurrence

Mitigation measures

Undertake the maintenance measures properly and timely whenever necessary to its intended standards and ensure possibility throughout the year, hence avoiding the risks of accident to road users.

The road design has provided the Provisionals of road safety measures to those identified accident prone areas to includes measures such as road signs, marking, humps, rumble strips, climbing lanes, parking bays, reduces sharp corners, road of dual carriage ways that can provide maximum road safety measures to road users during operation of the road project.

The Contractor shall prepare among others, the **Traffic Management Plan** to manage the road related risks to road users and enhance the appropriate measures. The TMP shall include the road safety awareness campaign and safety strategies to be applied by the contractor when on site.

The risk of livestock roadkill is acknowledged in the Design report where provisions for livestock underpass and overpass have been provided along the road. The designated areas for animal crossing shall be provided with special road signs to those areas identified in the design. However, during undertaking the Supervising engineer shall provide the provisions of consideration to those news animal crossing areas that will be identified by community during project undertaking.

Residual impact

With the implementation of mitigation measures, the number of human and animal kills and accidents will decrease along the road and the significance of the impact be minor. The probability of occurrence will also decrease. The residual positive impact from the improved transport sector allowing for economic development would remain major. The significance of the barrier effect would remain the same.

xviii. Impact on livelihood and economic activities

The following impact and risk were identified in the impact identification matrix:

Improved transport sector allowing for economic development. The widening/rehabilitation of the road will reduce time of travelling and ensure safer travel for vehicles and trucks. These will have positive influence of economic development.

Impact significance

Improving the transport sector is one of the key objectives of the project. The significance of the positive impact will be medium, the extent regional and the duration permanent.

	Improved transport sector allowing for economic development
Intensity	Medium
Extent	Regional
Duration	Permanent
Significance	Major
Occurrence	High probability

probability	

xix. Impact on community use of the road and safety aspects

The following impact and risk were identified in the impact identification matrix. The several major junctions, centers, villages with more road users where identified to be prone to road accident. The road project will bring the possibility of accident occurrence to road users from (traffic movements).

Roadkill may be due to road speed due to road improvement, poor road signs, poor road geometric, road marking as well as poor road safety awareness to road users which requires the remedial measures to mitigate. Improved safety for motorized and non-motorized road users. Increase in road traffic and speed will increase the risk of collision and accidents.

Impact significance

Regarding the impact on road accident along the identified major centers and villages, the impacts will be moderate significant with moderate intensity given that traffic will continue to increase, the extent would be local and the impact permanent.

Regarding the increase safety risks for motorized and non-motorized road users. The installation of road safety cramming measures will improve safety of non-motorized users along the road by providing the NMT sidewalks. Other initiatives is to improve safety measures such as the reduction of speed in village centers, climbing lane where the maximum grade is higher than 7%. The intensity of the positive impact will be medium, the extent local and the duration permanent.

Regarding impact on health, as highlighted in the WBG Toll Roads Environmental, Health, and Safety Guidelines, traffic noise can be a significant nuisance and may be loud enough to interfere with normal conversation and can cause stress in children and raise blood pressure, heart rates, and levels of stress hormones. However, this increase in road traffic is expected to allows the tolerable nonsense along the identified receptors due to the fact that the road is widened to dual carriage ways, hence the residential houses and community activities will be undertaken out of the road corridor, the intensity of the impact would therefore be negligible, as the road is an existing facility, the extent would be local and the duration permanent.

	Impact on connectivity across the road and disruption of access	**Improved safety for motorized and non-motorized road users**	**Health issues for population living along the road**
Intensity	Moderate	Medium	Negligible
Extent	Local	Local	Local
Duration	Permanent	permanent	Permanent
Significance	Moderate	Moderate	Negligible
Occurrence probability	Potential occurrence	High probability	High probability

Mitigation and enhancement measures

Regarding the impact of the rehabilitated road on small existing side roads, the design does not provide any specific measures. It is recommended to avoid installing guardrails along these side roads as much as possible to maintain access for vehicles and non-motorized transportation. If these side roads are deemed to be unsafe, the closure of their access from the trunk road shall be replaced by another access.

Pedestrian passage and vehicles passage shall be physically separated with barricades and construction fences to inhibit pedestrian movement into the work site.

The road design has provided the Provisionals of road safety measures to those identified accident prone areas to includes measures such as road signs, marking, humps, rumble strips, climbing lanes, parking bays, zebra crossing, reduces sharp corners, road of dual carriage ways that can provide maximum road safety measures to road users during operation of the road project.

The Contractor shall prepare among others, the Traffic Management Plan to manage the road related risks to road users and enhance the appropriate measures. The TMP shall include the road safety awareness campaign and safety strategies to be applied by the contractor when on site.

Safe passage at identified crossing sites for pedestrians with appropriate signage using pictograms and adequate protection from work engines and trucks and motorized traffic indicating diversion and entrance. Among others, the TMP shall include the following provisions to Contractor to undertake:

- Work site to be clearly delineated and create exclusion zones.
- Construction fences and work exclusion zones shall be visible at night.
- In addition to regular OHS training for workers, awareness shall focus on ensuring community safety from work. Traffic Management Plan and OHS Management Plan shall be prepared and implementation by Contractor.
- Regarding security of non-motorized means of transportation, the design has foreseen the installation of raised pedestrian crossings and appropriate signage for pedestrian safety. Pedestrian crossings will be preceded and followed by rumble strips warning drivers to slow down.
- In addition, as shown in the following table, walkways will be upgraded at identified locations where existing walkways are present.

This ESIA recommends that additional engagement activities and design review to be undertaken at all villages that are crossed by the road to determine whether additional safety measures such as pedestrian crossings are necessary.

Residual impact

Regarding impact on connectivity across the road and disruption of access, with proper mitigation measures and crossings, the impact significance would be reduced to minor.

Regarding improvement of safety for non-motorized road users from the community, with enhancement measures, the enhanced positive impact would be of major significance. Regarding increase in health issues for population living along the road, the significance of the impact is unlikely to be lowered.

6.3 Cumulative and transboundary impacts

This section assesses potential cumulative impacts whereby the cumulative impacts are contextual and encompass a broad spectrum of impacts at different spatial and temporal scales at which a series of projects of the same type are being developed.

Cumulative impacts are those that result from the successive, incremental, and/or combined effects of an action, project, or activity (collectively referred to in this document as "developments") when added to other existing, planned, and/or reasonably anticipated future ones. For practical reasons, the identification and management of cumulative impacts are limited to those effects generally recognized as important on the basis of scientific concerns and/or concerns of affected communities.

Consequently, although the environmental and social impact assessment (ESIA) for this project has been undertake to assessing and managing the environmental and social impacts of individual projects, it often may be insufficient for identifying and managing incremental impacts on areas or resources used or directly affected by a given development from other existing, planned, or reasonably defined developments at the time identification of risks and impacts, hence, the evaluation and analysis of CIA in-line with this ESIA is pivotal for broad impacts assessment related to the road project well as other similar projects that are tracking place in locality.

Finally, CIA is one of several tools to consider as part of an overall process of environmental and social risk assessment and management. CIA processes involve continuous engagement with affected communities, developers and other stakeholders to ensure the effectiveness of project design and implementation that are taken place beyond technical and financial capacity.

Understanding the cumulative environmental and social impacts from multiple projects, actions, or activities from the same actions over an extended period of time which is located in the same geographic region are so important, hence may require, good practice such as ESIA assessment and process to determine how cumulative impacts may pose the risks to the environmental and social surrounding, hence needs to be mitigated.

The major environmental and social management challenges that are experienced today such as, loss of biodiversity, decline of coral reefs and fisheries, food insecurity, unreliable freshwater resources, flooding, drought, diseases can be resulted from cumulative impacts originate from individually, regional or even global levels. However, the ESIA and CIA assessment requires the obligations of developer to recognize how their actions, activities and projects implementation may contribute to cumulative impacts to environmental and social components along with existing or future developments that may also have detrimental effects so that to avoid and/or minimize these impacts to the greatest extent possible.

The ESIA study revered that, the proposed road project will not lead to any transboundary impacts given that no one identified parallel or along the road project.
In order to determine the cumulative impacts, the following steps have been undertaken:

- Identification and description of the environmental and social components that may be cumulatively impacted by these projects.
- Screening of the projects that could overlap in time and space with the project widening/rehabilitation.
- Determination of the spatial and temporal boundaries of the cumulative impact assessment.
- Identification and description of possible leverage to develop shared mitigation measures.
- Limitations and uncertainties of the cumulative impact assessment.
- Identification and description of the current or planned actions, programs, policies or strategies that aim at mitigating impacts on these components, including existing ESIA reports for these projects.

6.3.1 Determination of the spatial and temporal boundaries of the cumulative impact assessment

Cumulative Impacts Assessment is complex in term of costs, time and money. The CIA to be effective in supporting good overall environmental and social risk management it must be properly defined. Because it is unrealistic to think that every environmental and social aspect can be subject to cumulative impacts and be appropriately a good practice to focus on assessment and management strategies for identified Environmental and Social Components. For the purpose of the impact assessment, the spatial boundary would entirely cover all villages that are crossed. In terms of spatial boundaries, given that the road shall be widened/rehabilitated as per design and will take 2 to 3 years for completion, the temporal boundary would have to cover this period that could reach up to year 2025-2028.

The different between ESIA and CIA in road project context

(i) Environmental and Social Impacts Assessment (ESIA)

- Applies to the potential impacts of a particular development proposal.
- Done in the context of a well-defined development proposal for which the construction and operational details of the development alternatives are known.
- May include an assessment of the project's contribution to a well-known accumulated impact and propose standard mitigation measures.

(ii) Cumulative Impact Assessment and Management (CIA).

- Assesses the ecological and social impacts that determine the status of environmental components and affected communities.
- Requires consideration of past, present, and future projects and natural drivers that affect them.
- Assessment reflects the geographical and temporal context in which the effects are

Aggregating and interacting.

The two different views are not always distinct, and as noted before, CIA can be fully integrated throughout a good ESIA process. The assessment of accumulated impacts may draw on information from a variety of sources including regional environmental, social, and resource studies and programs; strategic, sectoral, and regional environmental assessments; project environmental assessments; CIAs from similar situations; and targeted studies on specific issues.

6.4 Climate change Risk Vulnerability Assessment along the road project

Climate hazards refer to weather events that are exogenous to the transport systems, and to their consequences on the project area. They are characterized by an intensity, a spatial probability of occurrence and a probability of occurrence in time.

The cross-referencing of climate hazards, the physical or functional vulnerability of the infrastructure and the issues, and the comparative analysis of the physical and functional criticality is referred to as risk analysis.

- Climate change will directly affect the proposed road infrastructure in several ways including High temperatures will cause road to easily develop cracks within a short period after their construction.
- Furthermore, higher temperatures combined with increased solar radiation (UV) may reduce the life of the proposed asphalt road surface. Additionally, high precipitation will allow new road to easily develop potholes.
- High precipitation may cause severe rainfall that can result to flooding along the road, since most of the proposed road alignment is passing in the areas prone to flood, hence may affect the drainage and culverts along the road.

The direct impact of climate change on the road and its indirect impact on other economic systems are equally enormous. Poor road resulting from huge potholes can lead to road accidents and delay the transport of foodstuffs, forest produce, and agricultural produce to their intended destinations within or outside Morogoro and Dodoma regions while traffic jams can lead to more fuel consumption in addition to huge time loss.

Risk Assessment Methodology

This subsection presents the general methodological approach to risk analysis. Two aspects to this approach were used:

"Functional" criticality, i.e. the transport services affected by the climate hazards

The failure or breakdown of an individual system, in particular due to an extreme climate hazard, impacts the level of service offered by the transport system and, therefore, the maintenance of the functions of the network, even in a degraded situation. This analysis, which links these issues to the functional vulnerability of transport networks, is referred to as the analysis of functional criticality.

"Physical" criticality, i.e. the physical units that make up the transport network affected by the factors.

When climate hazards impact the individual transport systems, which are more or less physically vulnerable, depending on the characteristics of their components, their strength, their behavior, etc. This analysis, which cross-references climate hazards and the physical vulnerability of individual transport systems.

Methodological Approach to Risk Analysis

From a methodological perspective;

- Physical criticality was analyzed first. In other words, determination of the impact of each climate hazard on proposed road and its components, according to its characteristics and, in particular, its physical vulnerability, in order to determine how it's liable to suffer serious damage. Then, examine its failure, and proceed with an analysis of the functional criticality of the road. In other words, it implies consideration on how the functionalities of the roads are affected by the failure of one or more road;
- Start with an analysis of the functional criticality. In other words, determining to what extent the proposed road failure would be costly in terms of functionality, by comparing its importance with the characteristics of the transport network between Dodoma and Morogoro regions. Then, conduct a physical criticality analysis by comparing the climate hazards and the physical vulnerability of proposed road in order to see whether its failure would be costly and effectively liable to break down when exposed to different climate hazards.

The comparison of the physical and functional criticality analyses finally leads to the risk analysis.

Identification of Climate Hazards

In order to assess the physical and functional criticality of proposed Morogoro- Dodoma road widening, it was first necessary to understand the climate hazards impacting the project area, their expected evolution in terms of climate change and their potential impacts on the road network. Then, these climate hazards must be characterized and their probability of impacting the road network must be assessed and rated.

Table 6.4: Climatic Extremes and the Corresponding Climate Hazards

Climate variable	Selected Climate Changes	
	Tendencies	Climate Hazards
Temperature	Temperatures have risen by about 1.0°C since 1960, an average of 0.23°C per decade. (USAID)	Increase in periods of drought
	An average increase of 1.0-2.7°C in annual temperatures by the 2060s, and of 1.5-4.5°C by the 2090s. (USAID)	Rise in temperatures
	Historical data shows remarkable changes in climate from 1980 to 2008. Average temperature has increased by more than 0.5°C in both the first and second seasons, with remarkable annual variations, particularly during the second season. The number of days with a maximum temperature above 35°C has significantly increased in the first season and slightly decreased in the second season. Both seasons show an increase in heat stress days, and drought.	increase in the number of days of heat wave
Precipitation	Annual rainfall has decreased at an average rate of 3.3 percent per decade. (USAID)	Increase in the extreme values and the number of days of precipitation
	Precipitation patterns have become more unpredictable, with an increase in the amount of precipitation falling in isolated events. (USAID)	
	Projected changes in annual precipitation by the 2060s range from a decrease of 1 percent to an increase of 18 percent from the 1970-99 average.	Floods
	A larger percentage of precipitation is anticipated to fall in heavy rainfall events.	
	Precipitation in Morogoro is high and in Dodoma has remained relatively unchanged in the first season, and slightly increased in the second. However, annual averages vary remarkably.	
Wind	Changes in wind systems	Changes in violent wind systems
	Excessively high winds can directly damage built infrastructure and the natural environment;	Violent wind: storms, tornadoes, etc.
Extreme events	As the climate continues to warm, the difference between the temperature near the surface of the	Changes in the cyclonic system

Climate variable	Selected Climate Changes	
	Earth and the temperature higher up in the atmosphere, is likely to decrease as the atmosphere continues to warm. As this vertical gradient weakens, it is likely that fewer tropical cyclones will form	

Characterization of Climate Hazards

Since climate hazards in the project area that could have a significant impact on the road network have been identified, it is necessary to characterize them in the present and the future and, therefore, to define climatic scenarios. In this way, their probability of occurrence, which is essential for the analysis of physical criticality, can be assessed.

Climate hazard is characterized by:

An Intensity: The intensity expresses the quantification of an event. It can be measured or estimated. In practice, thresholds of the classes of weather phenomena are used – rain, wind, heat, etc.; A Spatial Occurrence: Spatial occurrence is conditioned by factors of tendency or susceptibility, e.g., the spatial extension of a climate hazard can be highly variable, from very local (a few km²), to national, and very difficult to estimate.

The Temporal Occurrence of the Climate Hazard: instant and duration. The temporal occurrence can be estimated qualitatively (negligible, low, high) or quantitatively, by recurrence intervals (e.g., decennial to centennial). The duration of the phenomenon must also be taken into consideration. The duration can vary between a matter of hours, days, weeks or months.

Rating of Climate Hazards

The Table 6.5 and 6.6 below shows a scale with four levels for climate hazards rating.

Table 6.5: Climate Hazards Rating Scale

Class	Category Frequency	Description	Probability of occurrence by hours of service
4	Likely	The event is liable to occur several times in the lifespan of the project.	> 10-5
3	Rare	The event is liable to occur once in the lifespan of the project.	> 10-5 -> 10-7
2	Unlikely	The event is highly unlikely, but the risk of its occurrence in the lifespan of the project is not zero.	> 10-7 - > 10-9
1	Extremely unlikely	The event is so unlikely that the risk of its occurrence in the lifespan of the project is considered to be zero.	< 10-9

Table 6.6: Characterization and the Ratings of the Selected Climate Hazards

Selected Climate Hazards				
		1	**2**	**3**
Climate Hazard		Floods	Heat wave	Cyclones & Storms
Characteristics				
	Intensity	Fluvial	Extreme	Tropical Depression (TD)
	Spatial Occurrence	Local	Local	Local
	Temporal Occurrence	Low	High	Low
Rating				
	Likely		Θ	
	Rare			
	Unlikely	Θ		Θ
	Extremely unlikely			

Physical Vulnerability Assessment

This is considered as the sensitivity of the proposed road to a particular climate hazard, or the amplitude of the damage caused by the occurrence of this climate hazard. Should be understood that; the proposed road can be vulnerable to one climate hazard, but robust and resilient to others.

Table 6.7: Potential Physical Vulnerability to the Road Project

Road Component/Section	Considered Climate Hazards		
	Floods	**Heat wave**	**Cyclones & Storms**
Road Asphalt Surface/Pavement	Rainfall changes can alter moisture balances and influence pavement deterioration.	Temperature can affect the aging of bitumen resulting in an increase in cracking of the surface chip seal, with a consequent loss of waterproofing.	
Road Embankment	Flooding of road infrastructures lead to Embankment collapse and associated risks.		
Bridges/culverts	Increased frequency of extreme precipitation events increases the risk for flooding, which can reduce the service life of bridges by: Increasing the scouring rate of piers and bridge foundations, and build-up of sediments Increasing moisture levels in soil that may lead to loss of structural foundation integrity Small-scale bridges are more vulnerable since they are often not designed to withstand powerful floods or strong wind	Higher temperatures and extreme heat can cause bridges to be stressed by thermal expansion and movement and lead to premature deterioration of the structure.	Damage to infrastructure on roads, bridges, signs, Reduced safety for vehicles driving
Machinery and equipment's operations, generation of hazardous wastes	Increase CFC emission from used fridges and chip's Carbon emission	Higher temperatures and extreme heat can cause extreme flood and temperatures that can affect road	Damage to infrastructure on roads, bridges, signs, Reduced safety for

Road Component/Section	Considered Climate Hazards		
	Depleting of Ozone layer	infrastructure.	vehicles driving

The project will avoid the release of pollutants or, when avoidance is not feasible, minimize and control the concentration and mass flow of their release using the performance levels and measures specified in national law or the EHSGs, whichever is most stringent.

The proposed widening/rehabilitation of Morogoro- Dodoma road will significantly reduce emissions as a result of enhanced road conditions and improvements in vehicle fuel consumption efficiency. Among the efforts to reduce emissions are national policies which have stressed on importation of vehicles with not more than 10 years from manufacturing date. During construction, the contractor shall adhere to all recommended actions to reduce GHG emissions from operating vehicles, equipment and plants as per ESMP.

Climate change will directly affect the proposed road infrastructure in several ways. High temperatures will cause road to easily develop cracks within a short period after their construction. Furthermore, higher temperatures combined with increased solar radiation (UV) may reduce the life of the proposed asphalt road surface. Additionally, high precipitation will allow new road to easily develop potholes.

The direct impact of climate change on the road and its indirect impact on other economic systems are equally enormous. Poor road resulting from huge potholes can lead to road accidents and delay the transport of foodstuffs, forest produce, and agricultural produce to their intended destinations within or outside Dodoma region while traffic jams can lead to more fuel consumption in addition to huge time loss.

6.5 Analysis of Alternatives

The project will involve upgrading of the road sections with paved and unpaved sections, earthen sections and undefined sections into dual carriageway bitumen standard. That means the width of the existing alignment will have to be increased within the existing right of way (ROW) for 40 m. The upgrading of the road into bitumen standard and to widening into dual carriageway will facilitate comfortable travel, and reduce traffic congestion along the road sections.

The three alternatives have been considered in this study based on technical, economic, environmental and social point of view. That means the selected alternative must be technically feasible, economically viable, environmentally friendly and socially acceptable. The analysis of alternatives considered whether the project should be implemented or not ("No project" alternative versus "Project alternative"), and if it will be implemented what type of construction method should be used (Labour-intensive method versus Machine-intensive method). For comparison of these alternatives the Multi-Criteria Analysis Method has been used, based on Technical, Economic (Techno-economic), Environmental and Social Criteria.

The comparison of these alternatives has been based on their advantages and disadvantages.

6.5.1 No Project Alternative VS Project Alternative

The "No project" alternative" means the project should not be implemented at all and therefore we should continue using the road sections under existing condition but only making periodic maintenance. The comparison of alternatives based on techno-economic, environmental and social criteria is summarized in Table 6.5**.**

From techno-economic point of view the "No Project Alternative" will have less investment cost, but higher maintenance costs due to the need for long-term periodic maintenance. The "Project Alternative" will result into higher increased productivity due to reduced travel time and less fuel consumption due to reduced traffic congestion.

The improvement of the road condition will also result into reduced vehicle operation and maintenance costs, hence low transportation costs. Therefore, from techno-economic point of view the "No Project Alternative" should be rejected and the "Project Alternative" should be selected.

From environmental and social point of view the "No Project Alternative" will have long term impacts due to continued dust emission within unpaved or earthed sections, continued emission of exhaust fumes and more fuel consumption as a result of traffic congestion. The "Project Alternative", the above benefits will be achieved, but during construction the project is expected to have more environmental impacts including increased dust emission.

However, the environmental impacts will be short-term as they occur only during construction and could be minimized through implementation of appropriate mitigation measures. The improvement of the road condition into bitumen standard will result into more comfortable travel and improved aesthetic value of the urban environment due to less dust emission, hence socially acceptable. In addition, the Project Alternative is likely to create more temporary and income generation opportunity to the adjacent local residents during construction.

Therefore, from environmental and social point of view the "No Project Alternative" should be rejected and the "Project Alternative" should be selected.

Table 6.8: No Project Alternative VS Project Alternative.

Evaluation Criteria	No Project Alternative		Project Alternative	
	High	**Low**	**High**	**Low**
***(a)* Techno-economic**				
- Investment Costs	-	+1	-1	-
- Maintenance Costs	-2	-	-	+2
- Durability		-2	+2	
- Transportation costs	-2	-	-	+2
- Fuel consumption	-1	-	-	+1
- Vehicle operation and maintenance costs	-2	-	-	+2
- Travel time spent	-2	-	-	+2
- Productivity	-	-2	+2	-
***(b)* Environmental and Social**	-	-	-	-
- Dust emission	-2	-	-1	-
- Exhaust emission	-2	-	-1	-
- Employment and income generation opportunity	+1	-	+1	-
- Incidence risk of traffic accidents	-	-2	-2	-
- Aesthetic and/or social acceptability	-	-2	+2	-
TOTAL SCORE	**(-13) +(+1) = -12**	**(-8) +(+1) = -7**	**(-5) +(+7) =+2**	**(+9)**
OVERALL NET SCORE	**-12**		**+11**	

KEY:
+1 = Short-term Positive Impact
-1 = Short-term Negative Impact
+2 = Long-term Positive Impact
-2 = Long-term Negative Impact

Conclusion:
The "No Project Alternative" has been found to have an overall score of -12 and the Project Alternative an overall score of +11. Therefore, the "Project Alternative" should be selected and "No Project Alternative should be rejected.

6.5.2 Labour Intensive Alternative VS Machine Intensive Alternatives

The use of labour-intensive construction method is compared against machine-intensive construction method. The comparison of alternatives based on techno-economic, environmental and social criteria has been undertaken. However, from economic point of view the labour-intensive construction method makes use of manual labour and therefore likely to create employment opportunity to a large number of adjacent local residents than machine-intensive method, hence improving the local economy. The employment creation will have multiplier effect as it will also benefit their families, hence socially acceptable.

However, the use of mobile equipment / machine is more costly than labour-intensive method, but it is more efficient than labour-intensive method.

From environmental point of view the labour-intensive method will have minimum risk of construction related risk of accidents to construction workers and the local community, unlike the use of mobile equipment / machinery during excavation works,

Labour-intensive method has less environmental impacts compared to machine-intensive method. For example, the use of mobile equipment / machine is likely to create more dust emission than labour-intensive method. The use of mobile equipment / machine will also create air pollution and noise nuisance than labour-intensive method. The use of mobile equipment will have will create more landscape degradation than labour-intensive method.

From the analysis it can be seen that the labour-intensive method could be selected and machine-intensive method could be rejected. However, due to the nature of the project and limitations of labour-intensive method, the combination of the two methods should be more favourable. In this case, the contractor should give priority to labour-intensive method for those activities that could be done manually. For, example, excavation of roadside drainages could be done manually instead of using an excavator.

Table 6.9: Labour-intensive VS Machine-intensive Methods.

Evaluation Criteria	**Labour-intensive method**		**Machine-intensive method**	
	High	**Low**	**High**	**Low**
***(c)* Techno-economic**				
- Cost of equipment / machinery	-	+1	-1	-
- Employment creation	+1	-	-	-1
- Efficiency and time consumption		-1	+1	
- Work productivity	-	-1	+1	-
***(d)* Environmental and Social**	-	-	-	-
- Dust emission		+1	-1	-
- Exhaust emission	-	-	-1	-
- Landscape degradation		+1	-1	
- Risk of construction related accidents	-	+1	-1	-
- Social acceptability	+1	-		-1
TOTAL SCORE	**+2**	**(-2) +(+4) = +2**	**(-5) +(+2) = -3**	**-2**
OVERALL NET SCORE	**0**		**-1**	
KEY: +1 = Positive Impact -1 = Negative Impact				

Evaluation Criteria	Labour-intensive method		Machine-intensive method	
	High	Low	High	Low
Conclusion: The "labour- intensive method|" has been found to have an overall score of 0 and machine-intensive method an overall score of -1. Therefore, the "labor-intensive method" should be favorable than machine-intensive method. However, due to the nature of the project the labour- intensive method has got some limitations, and therefore the combination of the two methods should be more favorable.				

7.0 ENVIRONMENTAL AND SOCIAL MITIGATION/ENHANCEMENT MEASURES

This ESIA has described the current human and biophysical environment in which the widening/rehabilitation project will take place. The impact assessment has screened all project activities and their potential impacts and risks on components of the human and biophysical environment. The ESIA has also developed feasible and realistic mitigation measures and proposed management plans in the ESMP.

With current knowledge, there is no “red flag” or “fatal flaw” that would jeopardize the widening/rehabilitation project as most impacts are minor or moderate and are concentrated during works. The most significant impacts are in fact risks that have low probability to take place and that are inherent to all construction sites, these are risks of GBV, OHS risks for workers and the risk of child labor during works. These risks are avoidable with the proposed preventive measures.

At the end of quarry and borrow areas operation, the contractor shall commit to reinstate them to minimize any ongoing impacts on habitats. This includes removing all unnecessary rubble and removing all machinery and oil barrels and softening the slopes of quarry of borrow areas. Consultation with local authorities, shall be done to determine the fate of disused borrow areas. For example, borrow areas can be filled with unusable soil to reduce their depth or could be transformed into wetlands or livestock drinking ponds where appropriate (as requested during public consultations). Planting trees around the borrow area is also recommended to stabilize the slopes and avoid further erosion. Native trees shall be purchased from local nurseries.

It is, therefore, concluded that, implementation of the proposed this project will entail no detrimental impacts provided that the recommended mitigation measures are adequately and timely put in place. The identified adverse impacts shall be managed through the proposed mitigation measures and implementation regime laid down in this ESIA and its ESMP as well as other ESHS subplans. TANROADS is committed in implementing all mitigations and delegating some to the construction contractors and further carrying out the environmental auditing and monitoring schedules as presented in the ESMP. This ESIA concludes that, with appropriate mitigations, the Project will enable to achieve objectives materially consistent with the requirements of the World Bank ESF. The following table 6.7. Below summarizes all E&S impacts and risks and present the main mitigations and the assessment of residual impacts including impacts of the projects. The following table below summarizes all E&S impacts and risks of the project

Table 7.1: Summarizes all E&S impacts and risks of the project

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
Impacts and risks at Project preparation					
1	Impacts on biophysical and socioeconomic components		Assessment done for the construction phase for each component	Inclusion of measures developed in the ESMP in tender and contracts. Clear requirement to quantify health and safety measures and other measures in the Bills of Quantities. Inclusion of the framework ES instrument developed as part of DIST (such as the GBV action plan, the LMP and ESMF) in tender and in contractual documents. Establishment of the management structure at TANROADS to supervise E&S and H&S aspects of the project as required in the Environmental and Social Commitment Plan (ESCP). Environmental and social screening at selected quarries and sand pits. The C-ESMP and Querry and Borrow pits Management Plan shall be put in place.	Assessment done for the construction phase for each component
Impacts and risks at construction phase					
Biophysical environment related risks					

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
4	Impact on soil quality from accidental spillage of oil and poor management of hazardous and non-hazardous waste and sanitation	Potential occurrence	Minor	Good management practices such as spill tanks and secondary containment at vehicle maintenance yards. Collection, separation and sending waste, including hazardous waste to the appropriate service providers. Selection of the dumpsite for non-dangerous waste shall be done in close collaboration with district authorities and with the approval of the Supervising engineer based on several ES criteria. Septic tanks for wastewater. Certified spill response kit in all fuel bowsers with granular absorbent, bags and containers to remove polluted earth in case of spills. Stockpiling of bituminous waste for reuse at locations designated by the Supervising engineer. Waste and hazardous material management plan shall be put in place	Minor
5	Impact on soil from sealing of additional permeable surface and compaction by machinery	Potential occurrence	Minor	Confinement of work within the RoW to avoid unnecessary encroachment.	Minor

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
6	Impact on hydraulic transparency from construction, modification of aquatic habitats from widening of culverts and impact on ecological continuity of aquatic habitat from culvert replacement	High probability	Minor	Replacing culverts to be done preferably during the dry season. If it is not possible, installation of pumps or temporary diversions shall allow water to flow downstream of work. Installation of culverts partially under the riverbed level to avoid creating perched culverts. During culvert replacement, derivation roads shall not ford cross the watercourses (even during the dry season) and the crossing shall use temporary culverts. The C-ESMP shall be put in place.	Negligible

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
7	Impact on surface water quality during construction with expected increase of turbidity	High probability	Minor	Public consultations with concerned farmers that use the identified rivers to irrigate vegetables and paddy fields to determine the volume that could be abstracted without impacting downstream agriculture. The identified 8rivers shall not be used for Construction activities in order to reduce water conflict and pressure to communities along the road. The contractor shall make all necessary arrangement to drill his own boreholes at different locations as source of construction water. Avoid any discharge of effluent to natural stream/rivers along the road. Avoid water blockage when replacing/construction culverts od bridges to go downstream. All activities to be undertaken along rivers/natural stream shall be conducted during dry season. When working close or in watercourses, installation of silt fences upstream and downstream of work site to retain suspended solids. Installation of temporary slope stabilization measures during construction such as sediment diverting or catchment basins. The C-ESMP shall be put in place.	Negligible
8	Impact of accidental spillage of oil and concrete wash water on surface water quality	Risk (low probability)	Moderate	Avoidance of all discharge of concrete wash water in waterbodies or on the ground. An Emergency Preparedness and Response Plan (EPRP) and the C-ESMP shall be put in place shall be developed to prevent and address minor and major spills.	Minor

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
9	Risks on Disturbance of aquatic habitats and fish from water abstraction	Potential occurrence	Moderate	Public consultations with concerned farmers that use the identified rivers to irrigate vegetables and paddy fields to determine the volume that could be abstracted without impacting downstream agriculture. The identified 8rivers shall not be used for Construction activities in order to reduce water conflict and pressure to communities along the road. The contractor shall make all necessary arrangement to drill his own boreholes at different locations as source of construction water. Avoid any discharge of effluent to natural stream/rivers along the road. Avoid water blockage when replacing/construction culverts od bridges to go downstream. All activities to be undertaken along rivers/natural stream shall be conducted during dry season. Water right before any abstraction of construction water. Small streams shall be avoided due to little baseflow. Groundwater from boreholes shall be favored as a source of water for construction. Several rivers identified along the road shall not be used as a source of water by the contractor during construction activities. The C-ESMP shall be put in place.	Minor
10	Risks on Increase in noise level and vibration	High probability	Moderate	Avoid idling the engines. Certified absorbent noise barrier to limit nuisances for nearby communities is recommended whenever possible. Use of PPEs to workers on duties. Through engagement activities, schedule of work could be adapted at sensitive receptors based on feedback.	Minor

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
11	Risks on Emission of air pollutants from machinery and trucks that can also contributes to Climate Change gases. Climate change will directly affect the proposed road infrastructure in several ways. High temperatures. Furthermore, higher temperatures combined with increased solar radiation (UV) may reduce the life of the proposed asphalt road surface. Additionally, high precipitation will allow new road to easily develop potholes.	High probability	Minor	The project will avoid the release of pollutants or, when avoidance is not feasible, minimize and control the concentration and mass flow of their release using the performance levels and measures specified in national law or the EHSGs, whichever is most stringent. The proposed road will significantly reduce emissions as a result of enhanced road conditions and improvements in vehicle fuel consumption efficiency. Among the efforts to reduce emissions are national policies which have stressed on importation of vehicles with not more than 10 years from manufacturing date. During construction, the contractor shall adhere to all recommended actions to reduce GHG emissions from operating vehicles, equipment and plants as per ESMP. of vehicles with not more than 10 years from manufacturing date. During construction, the contractor shall adhere to all recommended actions to reduce GHG emissions from operating vehicles, equipment and plants as per ESMP.	Minor
12	Risks on Loss of roadside terrestrial and wetland habitats	High probability	Minor	Contractors to commit to maintaining all works within set boundaries to avoid unnecessary impact on habitats. The C-ESMP shall be put in place.	Minor

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
13	Risks on Destruction or disturbance of habitats at raw material extraction sites and off-site facilities	High probability	Moderate	Use existing wasteland for work sites and camps to avoid all conversion of natural habitats. Once exact locations of quarries are known, prior ecological survey shall be undertaken to delineate sensitive habitats, to determine potential impacts on habitats and possibly to recommend avoidance measures and influence decision-making. The Borrow Pits and Querry site Operation and Restoration Plan shall be prepared and implemented by the Contractors.	Minor
17	Risk of disturbance of aquatic habitat on constructing of culverts and bridges	Risk (low probability)	Negligible	Replacement of culverts shall be done outside of the rainy season as a precautionary measure. It is key that contractor be aware of the presence of the perennial rivers and its limits to ensure that special attention be paid during work close to the identified rivers.	Minor
18	Risk of destruction of ecological plant species	Risk (low probability)	Major	For all additional land requirement (outside of the existing road reserve) selection of sites shall be preceded by an ecological survey to delineate sensitive habitats, to determine potential impacts on habitats and possibly to recommend avoidance measures.	Minor
20	Risk of spread of alien and invasive plant species	Risk (low probability)	Minor	Cleaning and verification of machinery before commencement of work to ensure that no mud or soil is transported to the site.	Minor
Human environment related risks					

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
21	Risks related to Possible additional temporary and permanent restrictions on land use during construction	High probability	Minor or negligible	According to the RAP and ESIA study, the purchase of campsite facilities will normally be done through a willing-buyer willing-seller (wb/ws) approach. Development of land pre-entry and exit procedures and agreements with landowners and affected communities before the commencement of construction activities (and integrate these procedures and compensations in the RAP and its entitlement matrix). Temporary access to businesses during construction work shall be maintained by the contractor.	Negligible
22	Risks on Socioeconomic impacts on displaced persons (Compensation and relocation risks)	Potential occurrence	Minor	Mitigation measures are developed in the stand-alone Project RAP which is part of this ESIA.	Minor
23	Risks on Worker's influx, Contractor's camp and associated social impacts on communities	Potential occurrence	Minor	The project will construct the campsites at the areas which will be selected through collaboration and consultation between TANROADS, local government authority, customary authorities and contractor to minimizing any possible environmental and social risks to communities along the road. Induction training and sensitization for all workers (including unskilled workers) on GBV/SHE, GRM and LMP. GBV action plan and LMP with the Code of Conduct shall be in place	Minor

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
24	Risks on Strain on local services such as health services, water supply, waste management and electricity from the presence of work and workers	Potential occurrence	Minor	Disclosure to local public services the needs generated by the Contractors campsite and the construction site and coordinate the implementation of measures to prevent pressures on public infrastructure from having negative consequences on local communities. Contractor campsite Management Plan. Waste management plan and C-ESMP shall be put in place	Minor
25	Risks on Disturbances to livelihood and economic activities	High probability	Minor	Compensation package for PAPs is foreseen in the RAP. Access to businesses (service and retail businesses) from the road shall be maintained during work to avoid reducing their source of income. The RAP shall be observed and implemented.	Minor

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
26	Risks on Disturbance of local traffic, mobility and congestion and road accident impacting economic activities	High probability	Minor	The design has foreseen the installation of several raised pedestrian crossing. Pedestrian crossings will be preceded and followed by rumble strips. Additional engagement activities shall be undertaken at all villages that are crossed by the road to determine whether additional pedestrian crossings are necessary. Several walkways are recommended in several locations/centers. Speed reduction from 70 to 50 and 30 km/hour in villages, township and major centers, alongside community markets, schools and health centers. Traffic Management Plan shall be put in place.	Minor

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
27	Risks on Reduction of available water for irrigation and domestic uses to small farmers for the identified rivers along the road	Potential occurrence	Moderate	Public consultations with concerned farmers that use the identified rivers to irrigate vegetables and paddy fields to determine the volume that could be abstracted without impacting downstream agriculture. The identified 8 rivers shall not be used for Construction activities in order to reduce water conflict and pressure to communities along the road. *The contractor shall make all necessary arrangement to drill his own boreholes at different locations as source of construction water.* The water use permits shall be obtained from the authority. Avoid any discharge of effluent to natural stream/rivers along the road. Avoid water blockage when replacing/construction culverts od bridges to go downstream. All activities to be undertaken along rivers/natural stream shall be conducted during dry season.	Minor
28	Risks on Job opportunities	High probability	Minor+	Job offers shall prioritize permanent residents of neighboring communities. The local residence must be certified by the customary and local authorities. LMP shall be put in place.	Minor+

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
29	Risks on Impact on connectivity across the road and disruption of access	High probability	Minor	Safe passage at identified crossing sites for pedestrians with appropriate signage using pictograms and adequate protection from project machinery and trucks and motorized traffic indicating diversion and entrance. All passage shall be universally accessible to allow people with physical disabilities to safely cross. Traffic Management Plan and C-ESMP shall be put in place	Minor
30	Risks on Health and safety risks for communities during construction	Risk (low probability	Vary from minor to major	Pedestrian passage and vehicles passage shall be physically separated with barricades and construction fences to inhibit pedestrian movement into the work site. Work site shall be clearly delineated and create exclusion zones. Construction fences and work exclusion zones shall be visible at night. In addition to regular OHS training for communities, awareness shall focus on ensuring community safety from work. The OHS Management Plan shall be put in place	Vary from minor to major

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
31	Risk of improper behavior of security personnel	Risk (low probability)	Minor	The terms of the contracts of security personnel must be clearly established and the penalties for misuse of force must be stipulated in the contract. Contract shall include behavior commitments and clear and accessible disciplinary process. Security personnel shall receive procedural training (procedures, proper conduct and ethics and human rights). Training on GBV/LMP/GRM shall be given to workers by PIT staff during mobilization phase. GBV action plan with the Code of Conduct. *(Appendix VI and VII of the report)* SEP and its GRM. The GRM shall be accessible to community members who wish to file a complaint regarding security personnel behavior.	Minor
32	Risk of additional workload burden on women when men are hired for construction work	Potential occurrence	Minor	Impact hardly mitigable as recruitment of workers will not be able to detect this risk.	Minor
33	Risks on Disturbance of persons living with disabilities due to loss of access during construction work	Potential occurrence	Minor	All temporary passage shall be universally accessible to allow people with physical disabilities to safely cross work sites. TMP shall be put in place.	Nil

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
34	Risks on Spread of HIV	Risk (low probability)	Major	Raising awareness of the risks of sexually transmitted diseases shall be part of mandatory recruitment training for workers. Registered service provider to test workers. Assistance of an NGO to implement HIV/AIDS awareness campaigns. The Contractor HIV/AIDS awareness Programme shall be put in place.	Major (but reduction of the probability of occurrence of the risk)
35	Risk of child and forced labor	Risk (low probability)	Major	Children under the age of 18 years shall not be hired on site. Audits to ensure that no children and no forced labor are working on construction sites and in quarries. In case of suspicion or proven cases of abuse, the Supervising engineer must ensure that TANROADS and the World Bank be formally informed. The GBV/SEA and Labor Management Procedures (LMP) shall be put in place.	Major (but reduction of the probability of occurrence of the risk)
36	Risk of poor labor conditions due to high level of informality	Potential occurrence	Minor	Data log of all workers and implementation of the procedures as set in the Labor Management Procedures (LMP). Construction-ESMP shall develop procedures to ban any form of disguised employment, misclassification, informality or casual labor.	Minor (but reduction of the probability of occurrence of the risk)

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
37	OHS risks to workers	Risk (low probability)	Vary from minor to major	Implementation of the procedures as set in the Labor Management Procedures (LMP) regarding OHS. Work zone safety for construction workers at all time (use of protective barriers to shield workers from traffic vehicles in towns and village centers, use of traffic cones and barrels in rural areas, use of warning lights to avoid using flaggers). OHS preventive measures (training, PPE, hazard and risk identification, first aid). Any injury, accident or near miss shall be described in a medical report by the contractor and Supervising engineer. Labor Management Procedures (LMP) and OHS Plan shall be put in place.	Vary from minor to major (but reduction of the probability of occurrence of the risk)
38	Risk of an increase in Gender-Based Violence	Risk (low probability)	Major	The project shall also adapt GBV action plan, GRM and workers' Code of Conduct and implement. Training of Supervising engineer and contractors by PIT to present the GBV action plan requirements for managers. Induction training to all workers on the GBV action plan. PIT will Conduct a GBV risk assessment and GBV mapping in the project area to inform risk mitigation strategies and update a GBV referral pathway. Contractor shall also prepare the Construction ESMP to address the risks	Major (but reduction of the probability of occurrence of the risk)
Impacts and risks at Operation and maintenance phase					
Biophysical environment					
39	Risks on Accumulation of pollutants in roadsides	High probability	Minor	Appropriate signage to truck drivers to avoid littering. The design has foreseen to install drains with erosion	Minor

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
40	Risks on Infiltration of pollutants from roadsides in groundwater	High probability	Minor	checks which will reduce the silt load in streams. Removal of accumulated waste and silts in drains and culverts as part of road maintenance. Truck lay bays shall be equipped with garbage bins to collect domestic waste and waste collection at truck lay bays shall be contracted to a service provider. Traffic Management Plan shall be put in place.	Minor
41	Impact on surface water quality from road traffic and surface runoffs	High probability	Minor		Minor
42	Risks on Degradation of aquatic habitats from increase in road traffic and surface runoffs	High probability	Minor		Minor
43	Risks on Noise from traffic and reduction of noise due to road improvement	High probability +/-	Negligible +/-	Should the road cause noise level to unacceptable levels at sensitive sites such as health centers and schools, earthen mounds or vegetation plantation could be envisaged at project implementation.	Negligible +/-
44	Impact on air quality from road traffic and reduction of dust due to road improvement (Vehicle emissions of CO, SOx, NOx, Particulates)	High probability +/-	Negligible +/-	Regular water sprinkling on work sites. Proper maintenance of trucks and engines. All trucks transporting material shall be covered (including trucks travelling to and from quarries and borrow areas). The selection of the asphalt batch plant location shall be done in consultation among TANROADS, local government authorities, customary authorities, and the contractor to ensure that it does not lead to local nuisances. It shall be located at a suitable distance from households. Use of PPEs to workers on duties.	Negligible +/-

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
45	Risks on Soil erosion and earth grabbing from borrow pit and quarry site operations.	High probability +/-	Negligible +/-	The selected Contractor shall undertake Environmental and Social Due Diligence to ascertain the statutory compliance status of the selected Quarry/ies to supply the project. The Query site and Borrow pit operation plan (QSMP) shall be prepared and approved by Client before operations. Regular training shall be given to workers on Quarry site on safety issues. Water sprinkle shall be installed to mitigate air pollution. Clearance of unnecessary vegetation shall be minimized. Restatement plan shall be prepared and used during closure of the site. Regular monitoring to check compliance. Quarries without NEMC approval and/or non-Compliant to E&S requirements shall not be engaged/involved in project activities. Drainage structures should be properly installed to avoid scouring embankments with flat growing grass that will reduce erosion and enhance soil stability especially at cutting section. The impact will be mitigated by minimizing unnecessary vegetation clearance, proper cut off drains which will have to be constructed before commencement of construction works. Landscaping and reinstatement of the areas that were grabbed during construction, Retention and restoration of much of the original vegetation which includes trees through replanting of ecologically valuable plant species; Regular monitoring of areas affected by construction related activities and/or erosion. Contractor shall prepare borrow pits and quarry closure plans prior to handle the project.	Minor

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
46	Higher risk of livestock collision and Livestock roadkill	Potential occurrence	Moderate	Road signs for livestock crossing protection at several locations to be identified shall be put on place. The areas shall also be installed with Rumble strip to warn vehicles on the presence of the presence of livestock. Regular Road safety training programmes shall be done along the road with a focus on awareness and safe use of the road. Traffic Management Plan shall be put in place.	Minor
47	Risks on Climate change impacts may cause extreme temperature and precipitation that can affect road network and connectivity. Climate change will directly affect the proposed road infrastructure in several ways including High temperatures and high precipitation will allow new road to easily develop potholes, cause road to easily develop cracks within a short period after their construction.			Undertaking study on hydrology along the road. Proposal of the culverts and bridges that ca accommodate the risks of high precipitation caused by heavy rainfall. Design for bridges and culverts shall consider the factor of adjustment of 15% to accommodate the extreme weather event. Undertaking of regular cleanness of drainage and culvert before rain season.	
Human environment					

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
48	Risks on Improved transport sector allowing for economic development	High probability+	Major+	No specific enhancement measures.	Major+
49	Impact on connectivity across the road and disruption of access	Potential occurrence	Moderate	Maintaining access for vehicles and non-motorized transportation between the trunk road and small side roads (local roads).	Minor
50	Risks on Improved safety for motorized and non-motorized road users	High probability+	Moderate+	The design has foreseen the installation of several raised pedestrian crossing. Pedestrian crossings will be preceded and followed by rumble strips. Additional engagement activities shall be undertaken at all villages that are crossed by the road to determine whether additional pedestrian crossings are necessary. Several walkways are recommended in several locations/centers. Speed reduction from 70 to 50 and 30 km/hour in villages. Traffic Management Plan shall be put in place.	Major+
51	Risks on Health issues for population living along the road	High probability	Negligible	HIV/AIDS awareness and OHS training for communities and workers shall be provided by Contractors. HIV/AIDS awareness programme and OHS Management Plan shall be put in place.	Minor
52	Risks on Universal access to the road and walkways	High probability	Minor+	Several walkways are recommended in several locations/centers. Speed reduction from 70 to 50 and 30 km/hour in villages. Traffic Management Plan shall be put in place.	Moderate+

N°	Impacts/risks	Probability of occurrence	Impact significance before mitigation	Recommended main mitigations (and management plans)	Residual impact significance
53	Impacts on members of vulnerable groups, including persons with disabilities, women, the elderly, and persons with serious illnesses as well as in any case if there will be underserved societies along the road	Potential occurrence	Moderate	Due diligence has been undertaken during this study though (Community meetings, NGOs, PAPs, householders etc.) and the consultation result revered that, there is no any community that meet criteria of ESS7, hence if by any change these people will be identified along the road , then ESS-7 will be applied. However, the vulnerable groups such as persons with disabilities, women, the elderly, and persons with serious illnesses are likely to be identified along the road, hence, several mitigations measured have been identified in ESMP, TMP, RAP of the road to address this impact.	

8.0 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

The purpose of this Environmental and Social Management Plan (ESMP) is to ensure that the project is being implemented with minimum adverse environmental and social impacts. The ESMP focuses on avoidance or mitigation of potential impacts associated with the project activities and enhancement of project benefits.

The role of ESMP is to outline environmental requirements for the project and provide guidance for the Contractor to follow and properly manage environmental impacts during construction. It specifies mitigation, monitoring and institutional measures to be taken during construction and operation phases to eliminate any adverse environmental and social impacts, offset them or reduce them to acceptable levels. Specifically, ESMP identifies and summarizes all anticipated significant adverse environmental impacts and provides specific description of institutional arrangement for carrying out mitigation measures.

8.1 Environmental and Social Management Plan

The Environmental and Social Management Plan (ESMP) presents the implementation schedule of the proposed mitigation measures for environmental and social impacts, planning for long-term monitoring activities, and the estimated budget for implementing the recommended measures. The engineering designs have already incorporated some of the mitigation measures recommended in this Report. Additional recommendations are provided in the ESMP to enable the road project to be more environmentally friendly.

The implementation steps will involve the Contractor, Supervising Engineer, District Councils, Road Agency (TANROADS), road users, and local communities. The roles of these respective actors are as follows:

- The Contractor is responsible for engaging competent Environmental, Social, Health and Safety (ESHS) Officers who will be responsible for preparation of C-ESMP including adoptions of sub-plans (Contractor-LMP, C-GRM, C-SEP, GBV/SEA, WMP, TMP), implementation of the C-ESMP, HSMP, Sub-plans and reporting ESMP implementation on monthly basis.
- The TANROADS/ Supervising Engineer will be responsible with the approval of the C-ESMP and sub-plans, monitoring of C-ESMP implementation during construction works and reporting on progress of works.
- TANROADS has the responsibility to oversee implementation of the Monitoring Plan in collaboration with Local Government Environmental Management Officers (DEMOs).
- TANROADS PIT will be responsible for day-to-day activities of supervision and monitoring of the Contactor implementation of the project management plans such as the ESMP, GRM, SEP, LMP, GBV/SEA, as per WB-ESF requirements and prepare the monthly and Quarterly reports to be shared with TANROADS and WB.
- TANROADS is also responsible to ensure the Contractor E&S requirements are included into tender documents and into clauses of the BOQ and Contracts for smooth implementation of the road project.

- District Council through the District Environmental Management Officers (DEMOs) in collaboration with TANROADS (Department of Environment and Safety) are responsible for overseeing implementation of the Monitoring Plan from time to time.
- Road users and the local communities at large, their main role is to comply with road safety requirements.

8.2 Implementation of the ESMP

The Contractor (guided by his Environmental, Social, Health and Safety (ESHS) Officers shall be implementers of the C-ESMP during construction period under the supervision of the Engineer (guided by the Supervising Engineer's ESHS Specialists). The ESHS Specialists under the Engineer and the Contractor shall be employed on full time-basis to implement the C-ESMP in order to make sure that the ES measures recommended in the report are effectively complied with and timely adjusted whenever necessary. They will liaise with the relevant public agencies and carry out the training scheme associated to their assignment.

These specialists will liaise with the relevant public agencies and carry out the necessary training schemes associated to their assignments. The Contractor will be responsible in preparing the site-specific C-ESMP based on the ESMP presented in this report as wellas all mandatory ESMP-subplans and submit them to TANROADS PIT and the Supervising engineer for approval before implementation.

TANROADS as the Client, shall be the overseer of the ESMP through the Supervising engineer, and the Contractor. The environmental measures incorporated in the detailed engineering design will be attached to the contract documents of the Contractor.

8.3 Responsibilities of Project Key Players for ESMP Implementation

8.3.1 Role of Developer (TANROADS)

The Developer will monitor compliance of the Contractor through its implementation agency, and a stakeholder wide monitoring group comprising technical staff from government institutions (National Environment Management Council-NEMC, Ministry of Works (MoW), Ministry of Lands, Housing and Human Settlements Development-MoLHHSD, Chief Government Valuer-CGV) and Civil Society Organizations (CSOs).

8.3.2 Duties of the Consultant Supervisors' ESHS specialists

It will be the duty of the Supervising Consultant's Environmental Officer/Monitor to review ongoing construction plans with regards to their potential for adverse impacts to work being undertaken during the construction of the proposed project. The Environmental Monitor or his designate will be on site daily during the initial start-up of construction of the roads especially the Environmentally Sensitive Area (swamp crossing). At a minimum, weekly site visits are required if construction crews are working on site. If no construction is taking place, the Environmental Officer/Monitor will visit the site on a fortnightly basis to ensure all mitigative measures are operating as intended.

The ESHS Team will be responsible for the following activities:

- Review work schedules with respect to environmental management and monitoring;
- Monitor fuel delivery procedure regularly and check all equipment on site on a regular basis;
- Check condition and operational efficiency of all sediment control facilities. In accordance with the Sediment and drainage management plan;
- Supervise the implementation of the environmental social management plan and all the other required plans;
- Develop environmental orientation meetings;
- Work with TANROADS Environmental and Social Safeguards Unit in supervising and guiding construction contractor(s);
- Undertake scheduled site supervision of state of environmental compliance as documented or executed by the contractor's environmental officer; and
- Any other specific duties are prescribed in terms of reference developed for the supervising consultant by TANROADS.

8.3.3 Duties of the Contractor's ESHS Specialists

The ESHS Team will be responsible for the following activities:

- Preparation of a standalone ESMP linking environmental and social activities of the road works in line with guidance issued by TANROADS;
- Monitoring and ensuring compliance of all the contractor/s workers to the requirements of the contract and this ESMP;
- Monitoring and ensuring compliance to all GoT orders, rules, laws and regulations with respect to environmental and social matters;
- Day to day monitoring of environmental matters–this will include wider environmental aspects including matters not directly concerned with the actual construction such as contractor/s camps, off-site temporary storage and temporary works areas;
- Working with the Contractors Health and Safety Officer to manage community liaison issues and oversee the effective management of the project grievance mechanism as defined in Section 1800 of the special specification and the original ESIS;
- Working with the Contractors Health and Safety Officer and the Clients nominated subcontractor to facilitate the successful delivery of the project HIV/AIDS programme as defined in Section 1800 of the special specification;
- Working closely with the Engineers Environmental Specialist to ensure full compliance with all environmental and social aspects of this ESMP, the contract documents and any other GoT rules, regulations, orders or community requests as necessary and as required;
- Awareness raising and training of contractor staff with respect to environmental issues; this will include notification of the severe penalties for non-compliance with instructions which may include dismissal;
- Preparation of a monthly environmental monitoring report. This monthly report will be submitted to the Engineer for initial approval and will also require approval by the TANROADS Environmental Specialist;

- Attend all monthly site meetings and will report on their findings–problems, issues and corrective action taken–all of which will be included in the monthly report format;
- Any other matters or issues relating to environmental and social aspects of the works as defined by the Engineer;
- Review on-going construction plans with regards to their potential for adverse impacts, particularly if work is being undertaken in environmentally sensitive areas. Full-time employee of the contractor, the Environmentalist will be on site daily;
- Coordinating archaeological inspection and monitoring by a specialist archaeologist from the Department responsible for museums and monuments. This will also involve conducting cultural heritage tool box talks to construction personnel as advised by the Specialist Archaeologist;
- Maintain a log of community complaints/ grievances related to cultural heritage and corrective actions taken to address them;
- Plan environmental and social activities to be implemented alongside construction works;
- Ensure that planned activities are implemented, monitored and reported to the Supervising Engineering Consultant;
- Ensure community concerns are addressed;
- Prepare monthly reports to be submitted to TANROADS indicating environmental activities that were undertaken; and
- Prepare a Final Mitigation Report at the end of the project.
- Advise the Contractor on types and measures of personal protective equipment;
- Ergonomics' of the working conditions; and
- Close work as a team member in implementing environment management and Monitoring Plan.
- Oversee the overall implementation of RAP
- Working together with consultants from the Resident Engineer and TANROADS;
- To manage community liaison issues and oversee the effective management of the project grievance mechanism as defined in Section 1800 of the special specification and the original ESIS;
- To work with the clients' nominated subcontractor to facilitate the successful delivery of the project HIV/AIDS programme as provided for in the Standard Specifications for Road Works in Tanzania 2000;
- Undertake mainstreaming of gender issues into the entire project including but not limited to work placements, tools and fixtures, sanitary utilities, creating awareness on sexual harassment and any other forms of discrimination based on gender, ethnic background and race;
- Work with communities to address sexual harassment, adultery, sexual relations with minors and any other forms of anti-social behaviour like drug peddling associated with contract workers;
- To ensure full compliance with all environmental and social aspects of the ESMP, the contract documents and any other Government of Tanzania rules, regulations, orders or community requests as necessary and as required;

- Will serve to build strong and open communication with Local authorities, communities and faith organizations among other along the entire project route;
- Monitor resettlement activities involving project affected communities and identify individual liable to injurious damage early enough for further action;
- Handle, record, and monitor resolution of grievances that fall under contractor responsibility and report progress to TANROADS and SE;
- Serve as the Contractor's GRM focal point and coordinate grievance handling with SE and TANROADS;
- Produce monthly reports on social aspects of the project and submit them to the Engineer; and

8.3.4 Reporting

The Environmental Officer/Monitor will maintain regular contact with the Resident Engineer and will submit weekly monitoring reports detailing the following:

- A description of construction activities that may affect the environment;
- Any non-compliance (with contract conditions, regulations and guidelines) and any subsequent work stoppage;
- Unexpected environmental concerns and corrective measures;
- Amendments to the Environmental Management and Monitoring Plan or any other required plans;
- Any reports required by any other plans; and
- Tracking of issues causing environmental concern
- Any unresolved concerns will be carried over to the next reporting period until the issue has been resolved. This will allow for the tracking of issues until it is confirmed the issue/concern has been resolved.

8.4 ESMP Consolidated Table of Mitigation and Responsibilities

The negative impacts as well as their mitigation measures have already been discussed in the ESIA. This section now highlights the various mitigation measures, the party responsible for implementing it and the costs, this data makes up the Environmental and Social Management Plan (ESMP) which is presented in Table below. The costs of the proposed mitigation measures some of which will have already been included in the main engineering Bills of Quantities and therefore need not be included in the Environmental and social mitigation costs, should be included in the Bill of Quantities as the Environmental and Social Mitigation Costs.

The following actors will be involved:

i. **TANROADS/PIT:**
   TANROADS/PIT can delegate in part or fully some activities to local NGO or service providers. Whenever T/P does so, it will remain in charge of compliance with the measure presented). The composition of the PIT is presented in the ESMF.

ii. **Supervising Engineer (SE):**
   A dedicated ESHS specialist will be hire by the SE

iii. Main Construction Contractor (CC):

A full time dedicated ESHS officers on site will be hired by the CC.

These officers will oversee all ESHS aspects, including the implementation and monitoring of the C-ESMP and contractual ESHS obligations. He/she cannot perform other tasks. He/she shall have the required expertise in the related field to carry out these tasks.

The table 8.1 below: Presents impacts, mitigation strategy, performance indicators, responsibility and associated costs for the road project

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Table 8.1: Presents impacts, mitigation strategy, performance indicators, responsibility and associated costs for the road project.

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
Mitigations to be implemented at Project Mobilization						
Affected component: all components						
Impact to mitigate						
1	**Impacts on biophysical and socioeconomic components**					
2	**Resettlement of persons and displacement of assets**					
3	**Risk of GBV/SEA related to the compensation process**					
	Call for tenders and contracts for construction contractors shall include measures developed in the ESMP. In addition, some measures proposed in this ESMP involve a cost for the construction contractor, call for tender shall be clear on the requirement to quantify Social, health and safety measures and other measures in the Bills of Quantities (PPE, oil spill kit, etc.)	TANROADS	TANROADS	NA	Integration of applicable ESMP, HSMP and Sub-plans measures in tender and contracts	C-ESMP and Project costs
	Integration of appropriate ESHS wording in the tender documents for contractors. It is important to highlight in tender documents that in case of any historical findings then the Change finding shall apply as per	TANROADS	TANROADS	NA	Integration of applicable ESMP, HSMP and Sub-plans measures in tender and contracts	C-ESMP and Project costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Appendix V, (wetlands and watercourses) that would need to be protected from encroachment, deposition of demolition waste and rubbles and OHS risks to workers. It is also important to include requirement to ensure proper labor condition and protection against GBV/SEA. The framework ES instruments developed as part of DIST (such as the GBV action plan and the Labor Management Procedures) shall be included in tender and in contractual documents eveloped as part of DIST (such as the GBV action plan and the Labor Management Procedures) shall be included in tender and in contractual documents					
	Integration of detailed requirements in contractual documents for contractors and use of covenants in contracts. Covenants are formal obligations and prohibitions that the company must respect, they are not subject to interpretation	TANROADS	TANROADS	NA	Integration of applicable ESMP, HSMP and Sub-plans measures in tender and contracts	C-ESMP and Project costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Translation of ESMP and HSMP actions into contractual terms so that ES requirements can be well understood by the contractors and that they know their responsibility upfront. Tender and contractual documents shall highlight that contractors are required to abide by the ESMP	TANROADS	TANROADS	NA	Integration of applicable ESMP, HSMP and Sub-plans measures in tender and contracts	C-ESMP and Project costs
	Integration of appropriate wording on the chain of responsibilities included in contractual document to ensure E&S and H&S measures are taken down to the contractors. This includes integrating in the contract the followings: Commitments for the contractor to comply with the EIA license, the WB-ESF and its ESSs, National laws, ratified conventions on E&S topics including labor conditions, child labor, and sexual harassment. Important definitions as presented in the	TANROADS	TANROADS	NA	Integration of applicable ESMP, HSMP and Sub-plans measures in tender and contracts	C-ESMP and Project costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	ESIA -ESMP (GBV/SEA, LMP, GRM, SEP) Clear chains of responsibilities (between TANROADS PIT, the contractor and the Supervising engineer) Explicit statement that the Contractor is responsible for the E&S performance of its Subcontractors (including primary suppliers) including compliance with labor laws The requirements for the ESHS Officer from the contractor (and under the payroll of the contractor). The requirements to participate in conflict resolution as part of the GRM, LMP and GBV allegations. Clear requirements regarding training and induction trainings. Requirements for reporting on ES performances Penalties in cases of outstanding E&S items and repeated violations of E&S					

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		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	requirements, full or partial payment under specific line items of the bill of quantities could be withheld, either temporarily or permanently based on the cost of compliance. Clear statement on the fact that contractor shall ensure that its subcontractors also comply with the ES requirements and the WB ESF.					
	Establishment of the management structure at TANROADS to supervise E&S and H&S aspects of the project as required in the Environmental and Social Commitment Plan (ESCP)	TANROADS	TANROADS	NA	PIT is already formulated and is currently operational	Integrated in ESMP project cost
	Environmental and social screening to ensure that selected quarries and sand pits do not cause any environmental damages to natural and sensitive habitats and do not present any risks for neighboring communities (a model is included in the ESMP)	Contractor ESHS staff	TANROADS-PIT and SE	NA	The check list presented in this ESMP is used to select quarries and borrow areas Absence of impact on ES components	See cost below
	A stand-alone Resettlement Action Plan	TANROADS	TANROADS	TANROADS	Implement the Resettlement	See RAP and

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		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	(RAP) has been prepared to address all impacts and compensation related to the work.				Action Plan	Valuation report
	As required by the RAP promptly and timely compensations shall be paid to all PAPs who loss trees and crops along the road based on Tanzania laws and the World Bank ESS-5 on Land Acquisition, Restrictions on Land Use and Involuntary Resettlement before commencement of the construction activities.	TANROADS	TANROADS	TANROADS	Implement the Resettlement Action Plan and ensure Compensation is paid before clearance of trees and crops and assistances to the Vendors and their assets and before the beginning of construction	Included into RAP and valuation report
	As developed in the RAP, a Grievance Redress Mechanism (GRM) is in place to resolve all resettlement and compensation related grievances. As highlighted in the GRM, there will be open communication channels to register any complaints resulted from the project through established phone numbers and emails address as well as suggestion boxes at contractors, consultants, TANROADS regional Offices as well as Wards and Villages offices.	Contractors ESHS staff.	TANROADS	TANROADS	Implement the Resettlement Action The Grievance Redress Mechanism (GRM) is in place, communicated to all PAPs and operational	Included into RAP and Valuation report

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		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Sensitization of men on the use of compensation: when paying compensation, it is important to sensitize male heads of household on the use of compensation in order to prevent cases of dilapidation and GBV/SEA cases.	TANROADS	TANROADS	TANROADS	Measures integrated in the Resettlement Action Plan shall be implemented. Number of sensitization campaign to male/female PAPs	Included into RAP and valuation report
	Requirement that both spouse sign compensation agreements: signing of offset agreements and upstream negotiation processes should include women	TANROADS	TANROADS	TANROADS	Measures integrated in the Resettlement Action Plan shall be implemented. Number of compensation sign-off with both spouse signatures	Included into RAP and valuation report
	Assistance to open joint bank accounts during compensation. It is recommended, when paying compensation for household losses, to assist eligible persons to open a joint account that will be shared between men and women	TANROADS	TANROADS	TANROADS	Measures integrated in the Resettlement Action shall be implemented. Number of joint bank account opened for compensation payment	Included into RAP
	Prioritize compensation in kind for female heads of household.	TANROADS	TANROADS	TANROADS	Measures integrated in the Resettlement Action Plan shall be implemented Number of female heads of	Included into RAP and valuation report

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		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					households that opted for in-kind compensation	
Mitigations to be implemented at Construction phase						
Affected component: **Risks on Soil quality**						
Impacts to mitigate:						
4	**Impact on soil quality from accidental spillage of oil and poor management of waste and sanitation**					
5	**Impact on soil from sealing of additional permeable surface and compaction by machinery**					
	Good housekeeping shall be practiced within material storage compounds or vehicle maintenance yards where the possibility of spillage is great. This shall be done by installing spill tanks and secondary containment at vehicle maintenance yards.	Contractor	SE and TANROADS-PIT	Contractor	Presence of spill tanks and secondary containment at vehicle maintenance yards Measure adopted in the contractor's Waste and hazardous material management plan shall be implemented.	3,000,000 and other Integrated in the BoQ
	Collection, separation and use of appropriate service providers for management of hazardous and non-hazardous waste types.	Contractor	SE and TANROADS-PIT	Contractor	Presence of specific contract with Authorized wastes service dealers for all domestic and hazardous wastes including medical waste. Measure adopted in the	3,000,000 and other costs Integrated in the BoQ

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		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					contractor's Waste Material management plan shall be implemented.	
	Provision of sufficient waste bins at work site and workers camps and all off-site facilities. These shall allow for the separation of domestic nonhazardous waste and hazardous waste. Hazardous waste collection shall also be separated between medical waste and other hazardous wastes.	Contractor	SE and TANROADS	Contractor	Number of waste bins per type of waste. Measure adopted in the contractor's Waste Material management plan and C-ESMP shall be implemented.	2000,000 and other costs Integrated in the BoQ
	At the contractor campsite, rubbish containers shall be installed in a shelter on a wooden, metal, or concrete stand. Such containers must be emptied at regular intervals to avoid unpleasant odors associated with decaying organic materials	CC Contractor	SE and TANROADS	Contractor	Presence of shelter and wooden, metal or concrete stands. Intervals of waste collection (every two days) Measure adopted in the contractor's Waste Material Management plan and C-ESMP shall be implemented.	2500,000 and other costs Integrated in the BoQ
	Hazardous wastes (liquid) shall be handled in designated area with concrete surrounding or containers around the	Contractor	SE and TANROADS	Contractor	Liquid hazardous waste collection in designated areas on concrete.	2500,000 and other costs Integrated in

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	workshop to avoid spillage. Collected liquid waste shall be managed by designated service providers for disposal				Presence of a service provider for liquid hazardous waste collection Measure adopted in the contractor's Waste Material Management plan and C-ESMP shall be implemented.	the BoQ
	Hazardous waste (solid) such as used batteries, filters, metal scrapers, used tiles, bitumen drums shall be collected and stored in the designated area. Collected solid waste shall be managed by designated service providers for disposal.	Contractor	SE and TANROADS	Contractor	Solid hazardous waste collection in designated areas. Presence of a service provider for solid hazardous waste collection Measure adopted in the contractor's Waste Material Management plan and C-ESMP shall be implemented.	2500,000 and other costs Integrated in the BoQ
	Hazardous waste (medical) at the workers nursery shall be stored in biohazard containers and shall be managed in close collaboration with the nearest hospital	Contractor	SE and TANROADS	Contractor	Solid hazardous waste collection in biohazard containers and collected by the designated waste collector for disposal.	2500,000 and other Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					Presence of a contract for Authorised wastes dealers to dispose the wastes to the nearest hospital or health center incinerators. Measure adopted in the contractor's Waste Material Management plan and C-ESMP shall be implemented.	
	Prohibition to burn any type of waste, this includes but is not limited to oil, plastic, tires, and domestic waste. Burying waste in the workers camp shall also not be authorized	Contractor	SE and TANROADS	Contractor	Number of non-compliance with this measure. Covenant in the contractor's Waste Material management plan and C-ESMP shall be implemented.	Contractor ESMP
	Since there are no formal landfill in the vicinity of the road, non-dangerous waste that are generated at the workers camp (domestic waste) could be buried at a local dumpsite (in the absence of other alternatives). The selection of the dumpsite shall be done in close collaboration with	Contractor	SE and TANROADS	Contractor	Written justification for the selection of the local dumpsite included in the construction work report based on the set criteria. Proofs of signature of an agreement with a waste	Costs Integrated in the BoQ and ESMP

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	district authorities. In addition, the Supervising engineer shall validate the choice of dumpsite based on several ES criteria: Distance of the dumpsite to residential areas. Distance of the dumpsite to the nearest watercourse. Absence of impact on watercourse. Absence of impact on groundwater. Type of soil, it is preferable to select a site with impermeable soil and to avoid sandy areas. Overall management of the dumpsite (cleanliness, etc.).				collection company and the concern municipality. Measure adopted in the contractor's Waste Material management plan and C-ESMP shall be implemented.	
	Collection, separation, reuse and disposal of demolition waste: Bituminous waste shall be stockpiled for reuse at locations designated by the Supervising engineer. Disposal of demolition waste shall be done in accordance with clause 1713 of the	Contractor	SE and TANROADS	Contractor	Location of bituminous waste stockpile. Compliance with clause 1713 of the Standard Specifications for Road Works 2000. Measures adopted in the	2500,000 other costs Integrated in the BoQ

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		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Standard Specifications for Road Works 2000				Contractor's C-ESMP and implemented. Measure adopted in the contractor's Waste Material management plan shall be implemented.	
	Collection and management of wastewater: The camp sites shall have adequate toilets with septic tank. A contract with a service provider shall be established for regular maintenance and regular emptying. Septic tanks shall be installed in areas of stable soils that are nearly level, well drained, and permeable, with enough separation between the drain field and the groundwater table or other receiving waters. Mobile toilets shall be available to workers when working on the road sections. A contract with a service provider shall be established for regular maintenance and regular emptying	Contractor	SE and TANROADS	Contractor	Contract with service provider for regular maintenance and emptying of the septic tank. Location of the septic tank validated by the SE. Mobile toilets and contract with service provider for regular maintenance and regular emptying Measure adopted in the contractor's Waste Material management plan and Contractor's campsite management plan shall be implemented.	2500,000 and other costs Integrated in the BoQ

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		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Refueling shall be done in designated areas with minimal risk of collision with other vehicles. Small refueling stations and oil barrels must be on impermeable surfaces with controlled drainage (drip trays to collect small spillages). All fuel bowser (trucks) shall have a certified spill response kit with granular absorbent, bags and containers to remove polluted earth in case of spills. All workers handling fuel shall have proper training on the correct transfer and handling of fuels and chemicals and the response to spills. In case of small oil spills, granular absorbent shall be put on the spill. The contaminate earth shall be excavated and sealed in bag to be sent to appropriate treatment plants. Contaminated soil shall not be sent to municipal dumpsites. In case of large oil spills, the spill shall be contained and the site isolated with fences.	Contractor	SE and TANROADS	Contractor	Selection of refueling areas validated by the SE. Refueling station on impermeable surfaces with control drainage. Fuel bowser with certified spill response kit Number of small oil spills that were treated with spill response kit. Number of large oil spills and report and the corrective measure implemented. Waste Material management plan and Contractor's campsite management plan shall be implemented. Measures adopted in the contractor's Emergency Preparedness and Response Plan (EPRP) and C-ESMP shall be implemented.	2500,000 and other costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	The appropriate agency shall be contacted for guidance, and contaminated soil shall be excavated and transported to the designated treatment facility. o municipal dumpsites. In case of large oil spills, the spill shall be contained and the site isolated with fences. The appropriate agency shall be contacted for guidance, and contaminated soil shall be excavated and transported to the designated treatment facility.					
	Installation of secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids.	Contractor	SE and TANROADS	Contractor	Presence of secondary containment for fuel for all storage tanks Measure adopted in the contractor's Waste Material management plan and C-ESMP shall be implemented.	Integrated in the BoQ
	Confinement of work within the RoW and avoidance of unnecessary encroachment	Contractor	SE and TANROADS	Contractor	Number of noncompliance with this measure by the CC Measure adopted in the Contractor's C-ESMP shall	No cost

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					be implemented.	
Affected component: **Risks related to hydrology, water quality and aquatic habitats and fish**						
Impacts to mitigate:						
6	**Impact on hydraulic transparency from construction, modification of aquatic habitats from widening of culverts and impact on ecological continuity of aquatic habitat from culvert replacement**					
7	**Impact on surface water quality during construction with expected increase of turbidity**					
8	**Impact of accidental spillage of oil and concrete wash water on surface water quality**					
9	**Disturbance of aquatic habitats and fish from water abstraction**					
	When replacing or widening culverts: Installation of new culverts partially under the riverbed level to avoid creating perched culverts (that would block free movement of fish) and shall not have a steep slope to avoid increasing flow to a point where some fishes can no longer swim. For all works on arched metal culverts and box culverts, the contractor shall develop in its Construction-ESMP, a method for water work to ensure that free flow of water is not impacted, that material is not deposited in the streams and wetlands, and that turbidity of water does not increase.	CC	SE	CC	Percentage of culvert replaced during the dry season Number of culverts that were cleaned prior to widening/rehabilitation. Percentage of new culverts that are installed partially under the riverbed. Measures adopted in the Contractor's C-ESMP shall be implemented. The C-EMSP and design report includes a detailed	Integrated in the BoQ (including pumps and silt fences)

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	of water does not increase. Work shall be done preferably during the dry season. If it is not possible, installation of pumps or temporary diversions shall allow water to flow downstream of work. This is also key to avoid all impacts on downstream and upstream croplands that are dependent on water. Given the permanent presence of water in the box culverts, all work at these locations shall use diversion pumps and temporary enclosures to work in a dewatered environment. This measure is particularly important at locations where arched metal pipes will be fully replaced by larger box culverts. etal pipes will be fully replaced by larger box culverts. During work on permanent streams, (especially at box culverts location), silt fences shall be installed downstream of work to avoid increasing turbidity of				method for culvert replacement work.	

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		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	stream. Removal of all obstacles to free flow (rock, plant debris, waste) before replacement of culverts.					
	Local drainage and runoff flow patterns shall be maintained on the construction site to avoid creating local flooding or drought that could affect crops.	CC	SE	CC	Number of complaints from nearby farmers doing small scale irrigation and recession agriculture. Verification by the SE of work at all culvert site to ensure that hydraulic transparency is maintained and that there is no impact on nearby agriculture. Measure adopted in the Contractor's C-ESMP shall be implemented.	Costs Integrated in the BoQ
	Excavated material storage sites must never be done close to a watercourse to avoid impede the free flow of water or create bottlenecks. Selection of storage sites far from any	CC	SE	CC	Verification by the SE of work at all culvert site to ensure that no excavated material is stored close to a waterbody.	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	watercourses and wetlands.				Measure adopted in the Contractor's C-ESMP shall be implemented.	
	During replacement of culverts, the need for derivation roads shall be determined. If necessary, derivation roads shall not ford cross the watercourses (even during the dry season) and the crossing shall use temporary culverts that are size to ensure free flow of water. Abutments at these temporary crossing shall be stabilized with geotextile membrane and riprap rocks.	CC/SE	SE	CC	Method for full culvert replacement avoiding the need for derivation road and to ford cross the waterbody. Measure adopted in the Contractor's C-ESMP shall be implemented. Presence of temporary culverts sized to guarantee free flow of water. Abutment are stabilized with geotextile and rocks Measure adopted in the Contractor's C-ESMP shall be implemented.	Costs Integrated in the BoQ
	Refueling of engines or transfer of materials should not be carried out near water bodies,	CC	SE	CC	Presence of silt fences upstream and downstream of	Costs Integrated in

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	and any local spillage shall immediately be remedied. When working close to watercourses: Installation of silt fences upstream and downstream of work site to retain suspended solids. Installation of temporary slope stabilization measures during construction such as sediment diverting or catchment basins. All machinery working close to a waterbody shall have certified emergency spills containment which include silt floating and oil spill containment booms. A skimmer to suck up the contained spill shall also be foreseen on site. In case of minor spills, the contained waterborne spills shall be sucked with a skimmer up to remove the oil from water. The collected oil shall be sent to a treatment facility and shall not be discharged on soil. atment facility and shall not be discharged on soil.				work. Presence of temporary slope stabilization measures during construction such as sediment diverting or catchment basins. Certified emergency spills containment in all machinery. Measures adopted in the contractor's Emergency Preparedness and Response Plan (EPRP) shall be implemented. Measure adopted in the Contractor's Erosion and Sediment Control Plan shall be implemented.	the BoQ

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		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	An Emergency Preparedness and Response Plan (EPRP) shall be developed to prevent and address minor and major spills, which would require to mobilize necessary resource to maintain and clean the spill.					
	Avoidance of all discharge of concrete wash water in waterbodies or on the ground. Temporary washout containers shall be installed to allow wash water to evaporate. The hardened cementitious solids could then be recycled.	CC	SE	CC	Number of cases of discharge of concrete wash water in a waterbody. Presence of temporary washout containers to allow water to evaporate Recycling of the hardened cementitious solids Measure adopted in the Contractor's C-ESMP shall be implemented.	Costs Integrated in the BoQ
	When removing culvert wingwalls, machinery shall not work from the stream and shall avoid all encroachment. The culvert embankment shall be rapidly stabilized upstream and downstream with	CC	SE	CC	Avoidance of work from the stream. Stabilization directly after work with riprap or gabions. Measure adopted in the	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	riprap or gabion in addition to the new wingwall to avoid leaving bare soil and erosion of the banks.				Contractor's C-ESMP shall be implemented. Measure adopted in the Contractor's Erosion and Sediment Control Plan shall be implemented.	
	At the contractor's campsite, grey water or wastewater shall never be discharged in a natural waterbody but be collected in skeptic tanks to avoid discharge in natural ditches and in watercourses.	CC	SE	CC	Measure adopted in the contractor's Workers' camp management plan shall be implemented.	Costs Integrated in the BoQ
	Obtainment of a water right before any abstraction of construction water in the project area.	CC	SE/TP	CC	The water right shall be obtained from the authority Measure adopted in the Contractor's C-ESMP shall be implemented.	Costs Integrated in the BoQ
	Regardless of their suitability for water, small streams shall be avoided due to little baseflow.	CC	SE	CC	Selection of the water sources for construction that complies with this condition. Boreholes shall be	Costs Integrated in the BoQ

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		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					established as sources of water for construction after acquiring water permit. Measure adopted in the Contractor's C-ESMP shall be implemented.	
	Groundwater from boreholes shall be favored as a source of water for construction. Borehole's location shall be selected to avoid impact on private wells. Permit for water obstruction shall be acquired.	CC	SE	CC	Percentage of groundwater used for concrete production. Measure adopted in the Contractor's C-ESMP shall be implemented.	Costs Integrated in the BoQ
Affected component: **Risks of noise level and vibration**						
Impact to mitigate:						
10	**Increase in noise level and vibration**					
	When working close to residential areas and in villages, work shall be undertaken during daytime only.	CC	SE	CC	Compliance with this measure. Measure adopted in the Contractor's C-ESMP shall be implemented.	1000,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Avoidance of idling the engines. Machinery shall also be serviced regularly to avoid unnecessary noise and air pollution.	CC	SE	CC	Certificate or proof of maintenance Compliance with the avoidance of engine idling Measures adopted in the Contractor's C-ESMP shall be implemented.	Costs Integrated in the BoQ
	Use of certified absorbent noise barrier to limit nuisances for nearby communities whenever possible. Such noise barriers could be used around generators and stationary engines.	CC	SE	CC	Presence of absorbent noise barriers around stationary engines and the generators Measures adopted in the Contractor's C-ESMP shall be implemented.	Costs Integrated in the BoQ
	Communication of the schedule and duration of work to affected communities and at location where there are sensitive receptors (such as schools, hospitals and places of worship). If needed, schedule of work could be adapted based on collected feedback and close to these sensitive receptors	T/P	T/P	NA	Number of engagement activities as part of the DIST Stakeholder Engagement Plan held to present the calendar of work.	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
Affected component: **Risks of noise level and vibration**						
Impact to mitigate:						
11	**Emission of air pollutants from machinery and trucks**					
	Dust from work sites in village and town centers shall be reduced. This includes spraying the access to the construction site and other off-site facilities (quarries). The frequency of sprinkling shall be increased during the dry season.	CC	SE	CC	Number of time water is sprayed in residential areas and at quarries per day. Querry site shall be installed with water sprinkle for dusts control. Regular watering suppression by water bousers to control dusts along the road. Undertaking regular monitoring of dust levels to check on standard limits. Measures adopted in the Contractor's C-ESMP and QSBPMP shall be implemented.	4,000,000 and other costs Integrated in the BoQ
	The use of water to suppress dust shall not be done at the expense of sensitive aquatic	SE	SE	SE	Contractor shall identify and drill his own Boreholes as	4000,000 other costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	habitats and sources of domestic water. Location for water abstraction shall be validated by the Supervising engineer.				the sources of water after acquiring water permit from the authority. As part of reducing conflicts and pressure on water use with communities, the water from rivers shall not be used for construction activities. Validation of all water abstraction sites by the Supervising engineer	are Integrated in the BoQ
	Vehicles maintenance: vehicles and trucks will be verified and serviced on a regular basis, especially oil changes in vehicles, trucks and machinery to avoid unnecessary air pollution from exhausts. All trucks transporting material shall be covered (including trucks travelling to and from quarries and borrow areas).	CC	SE	CC	Frequency of truck and vehicle maintenance Proof of maintenance of all vehicles and trucks. Number of trucks with cover Measures adopted in the Contractor's C-ESMP shall be implemented.	Costs Integrated in the BoQ
	The selection of the asphalt batch plant location shall be done in consultation among TANROADS, local government	CC & T/P	SE & T/P	CC	Distance between the asphalt batch plant and the nearest house.	Costs Integrated in the BoQ

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		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	authorities, customary authorities, and the contractor to ensure that it does not lead to local nuisances. It shall be located at a suitable distance from households.				Number of complaints collected through the GRM	
Affected component: terrestrial habitats and wetlands and associated flora						
Impacts to mitigate:						
12	**Loss of roadside terrestrial and wetland habitats**					
13	**Destruction or disturbance of habitats at raw material extraction sites and off-site facilities**					
	Work and storage of spoils and machinery shall remain within the existing road reserve. Contractors to commit to maintaining all works within set boundaries to avoid unnecessary impact on habitats and historical site.	CC	SE	CC	Compliance with this measure. Measures adopted in the Contractor's C-ESMP shall be implemented.	2500,000 other costs are Integrated in the BoQ
	In order to limit all work within set boundaries, and to manage off-site impacts, the contractor shall request the Supervising engineer whenever additional land is temporarily required along the road.	CC	SE	CC	Compliance with this measure. Measure adopted in the Contractor's C-ESMP shall be implemented.	No cost
	Once exact locations of quarries are known, prior ecological survey shall be undertaken	T/P	T/P	NA	Ecological survey is done for all quarries and borrow	25,000,000 other costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	to delineate sensitive habitats and the Quarry and Borrow Pits Management Plan shall be prepared to determine potential impacts on habitats and possibly to recommend avoidance measures. The outcome of this survey and QSBPMP shall be submitted and communicated to the Supervising engineer, the contractor and TANROADS to assist in the decision making and follow up. Refer to the Environmental and Social Check List for all additional land requirement (quarry/borrow areas, workers camps, work sites. dditional land requirement (quarry/borrow areas, workers camps, work sites.				areas to assist in the decision-making Decision adopted in the Contractor's C-ESMP shall be implemented Contractor to develop and implement a Borrow Pits and Quarry Sites Operation and Reinstatement Plan (QSBPMP)	are Integrated in the BoQ
	Reinstatement of quarries and borrow areas to minimize any ongoing impacts on habitats. This includes removing all unnecessary rubble and removing all machinery and oil barrels and softening the slopes of quarry of borrow areas.	CC	SE and T/P	CC	All quarries at their end of life are reinstated and the restoration is validated by the RE as per approved Quarry site and Borrow Pits Plan (QSBMP)	17,500,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Consultation with local authorities, shall be done to determine the fate of disused borrow areas				Measure adopted and implemented in the Contractor's Borrow Pits and Quarry Sites Operation and Reinstatement Plan	
Impacts to mitigate:						
Affected component: **Ecological plant species**						
Impact to mitigate:						
18	**Risk of destruction of Ecological plant species**					
	All work sites and campsite shall be located in brownfields, in areas already disturbed by past activities	CC	SE	CC	The selection of areas for contractor's campsite shall comply with all measures proposed in this ESIA and other ES subplans. Measure adopted in the Contractor's C-ESMP and Campsite management Plan shall be implemented	Integrated into project costs
	For all additional land requirement (outside of the existing road reserve), the selection of site be preceded by an ecological survey and preparation of ESMP and QSBPMP to	T/P	T/P	NA	Ecological survey and Querry site and Borrow Pits Management Plan (QSBPMP) shall be	Integrated into project costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	determine potential impacts on habitats and possibly to recommend avoidance measures. The outcome of this survey shall be communicated to the Supervising engineer, the contractor and TANROADS for follow up and guidance. Refer to the Environmental and Social Check List for all additional land requirement (quarry/borrow areas, workers camps, work sites).				undertaken for all additional land requirement for borrow pits and query site. Decision adopted in the Contractor's C-ESMP and (QSBPMP) shall be implemented	
Affected component: **Risks on Alien and invasive plant species**						
Impact to mitigate						
20	**Risk of spread of alien and invasive plant species**					
	Cleaning of machinery before commencement of work to ensure that no mud is transported to the site. Cleaning machinery shall also be performed when working close to watercourses. Lastly, all earth spoils shall be rapidly reused or covered to avoid colonization by invasive plants	CC	SE	CC	Machinery is clean before commencement of work Spoils are covered rapidly Measures adopted in the Contractor's C-ESMP and Workshop Management Plan shall be implemented	costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
Affected component: **Population distribution and settlement pattern along the road**						
Impacts to mitigate:						
21	**Possible additional temporary and permanent restrictions on land use during construction**					
22	**Socioeconomic impacts on displaced persons**					
	For all additional land, the willing-buyer willing-seller approach shall be verified	SE	SE	CC	Written minutes to confirm existence of the negotiation and consultation with landowners and documentation on the land acquisition process. Confirmation that the land that was sold was not under any form of rental. Compensation is done in accordance with the RPF (and Project RAP).	Cost Integrated in the BoQ
	Development of land pre-entry and exit procedures and agreements with landowners and affected communities before the commencement of construction activities (and integrate these procedures and compensations in the RAP and its	T/P	T/P	CC	Integration of the land pre-entry and exit procedures before work Mobilization of a project land acquisition team on the ground to reach agreement	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	entitlement matrix). These procedures shall include restoring cultivated land to allow livelihood activities to resume after work. Land pre-entry and exit procedures and agreements shall be reach with the owners of land by TANROADS using the same entitlement matrix and compensation thresholds as in the RAP, negotiation with land and asset owners are under the responsibility of TANROADS and shall not be done by the contractor. This will require the mobilization of a project land acquisition team on the ground to reach agreement for temporary access during construction. esholds as in the RAP, negotiation with land and asset owners are under the responsibility of TANROADS and shall not be done by the contractor. This will require the mobilization of a project land acquisition team on the ground to reach agreement for temporary access during				for temporary access during construction	

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	construction.					
	All crops and properties that will be accidently damaged by operating vehicles, equipment and machinery and vibration during construction activities shall be compensated by the Contractor using the RAP entitlement matrix and compensation thresholds in consultation with TANROADS	CC	T/P and SE	CC	Number of accidental damages Number of compensations paid Number of collected grievances Measure adopted in the Contractor's C-ESMP and RAP shall be implemented	Costs included into ESMP
	Temporary access to businesses during construction work shall be maintained by the contractor	CC	SE	CC	Compliance with this measure Measure adopted in the Contractor's C-ESMP and Livelihood Restoration Plan shall be implemented	Costs Costs Costs Integrated in the BoQ
Affected component: social indicators						
Impacts to mitigate:						
23	**Impacts on Worker's influx, workers camp and associated social impacts on communities**					
24	**Strain on local services such as health services, water supply, waste management and electricity from the presence of work and workers**					
	Selection of campsite's locations through	T/P	T/P	NA	Consultation with	Costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	collaboration and consultation between TANROADS, local government authority, customary authorities and contractor to minimize any possible environmental and social risks to communities and ecological areas along the road Consultations and information disclosure are held on a regular basis with local communities concerned by the proposed campsite				stakeholders as part of the Stakeholder Engagement Plan (SEP) Minutes of meeting included in the SEP Number of complaints collected through the grievance redress mechanism (GRM) Campsite Management Plan and C-ESMP shall be implemented.	Integrated in the project cost
	Contractors' campsite shall be designed to prevent contamination of any water body, to ensure hygiene and to avoid the proliferation of mosquitoes, flies and rodent	CC	SE	CC	Collection of all grey or wastewater from the campsite by the authorized waste dealers to the area allocated for emptying waste water. Measure adopted in the Contractor's C-ESMP shall be implemented Measures adopted in the	Costs Integrated into BOQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					contractor's campsite Management plan shall be implemented	
	Workers' Code of Conduct ***(Appendix VI and VII of the report)*** shall be enforced to ensure that all workers behave in a respectful manner and to avoid all conflicts with local communities and GBV	CC	SE	CC	DIST Workers Code of Conduct, LMP, GBV/SEA shall be adopted and implemented. Number of complaints collected through the grievance redress mechanism (GRM) and measures undertaken.	Costs Integrated into BOQ
	The establishment of Contractors campsite should not lead to pressure on public services such as drinking water, electricity and health care. Disclosure to local public services the needs generated by the Contractors campsite and the construction site and coordinate the implementation of measures to prevent pressures on public infrastructure from	T/P and CC	T/P and SE	CC	Consultation with stakeholders as part of the Stakeholder Engagement Plan (SEP) The contractor shall drill boreholes for extraction of water for construction activities. Minutes of meeting included	Costs Integrated into BOQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	having negative consequences on local communities (hospitals, roads, electricity consumption, water intake). The construction contractor will have to study these risks and will have to set up its own services such as a first aid center and source of water. isks and will have to set up its own services such as a first aid center and source of water.				in the SEP Measures adopted in the contractor's Campsite Management Plan, Workers Code of Conduct, LMP, GBV/SEA shall be adopted and implemented.	
	TANROADS in collaboration with utility companies (TANESCO and TTCL) will be responsible for relocation of utilities and this will be done before commencement of construction works. If temporary closure of water utilities is unavoidable, early notice shall be given to the community before removal and relocation of water utilities and alternative temporary domestic water supply shall be established	T/P	T/P	CC	Consultation with utility companies as part of the Stakeholder Engagement Plan (SEP) Minutes of meeting included in the SEP Measures adopted in the Contractor's ESMP shall be implemented	No cost
Affected component: **livelihood and economic activities**						
Impacts to mitigate:						

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
25	**Disturbances to livelihood and economic activities**					
26	**Disturbance of local traffic, mobility and congestion impacting economic activities**					
27	**Reduction of available water from perennial rivers used for irrigation and domestic use for villages along the road**					
28	**Job opportunities**					
	Compensations and relocation of affected PAPs and Properties as part of the RAP implementation				See stand-alone RAP documents	
	Public consultation with farmers that use water from all the identified rivers across the road project. This consultation shall aim at determining the volume that could be abstracted without impacting downstream agriculture. Collected information shall assist in the decision making. Depending on the severity of the impact, alternative sources shall be found or compensation shall be paid to affected farmers, in line with the RAP and its entitlement (refers to RAP of the report)	T/P	T/P	CC	Consultation with affected farmers as part of the Stakeholder Engagement Plan (SEP). Contractor shall drill his own boreholes as source of water for construction activities. No water shall be allowed to be fetched by the contractor from rivers across the road project. Minutes of meeting included in the SEP Measures adopted in the	Costs Integrated in the project cost

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					Contractor's ESMP shall be implemented	
	Risks on road accident to road users	CC	SE	CC	Installment of road signs in all areas identified as blackspots. Installation of the road signs in all areas where construction activities are taking place. Public awareness on road safety shall be undertaken regularly. Contractor to develop and implement Traffic Management plan	27,500,000 other costs are Integrated in the BoQ
	Jobs to be granted for local people must be negotiated based on the adopted LMP by the Contractor. All jobs that fit for local communities shall be identified and communicated to their local authority for transparent way of engagement.	CC	SE	CC	Number of workers engaged from local communities during the construction phase. Measures adopted in the Contractor's Labor Management Procedures	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					shall be implemented	
	Off-site recruitment center to jobs to be capture by local residents, prioritizing permanent residents of neighboring communities.				Measures adopted in the Contractor's Labor Management Procedures shall be implemented	Costs Integrated in the BoQ
	The contractor shall strive to source materials, equipment and services that can be provided by local suppliers	CC	SS	CC	Measures adopted in the Contractor's ESMP shall be implemented	Costs Integrated in the BoQ
Affected component: community use of the road and safety aspects						
Impacts to mitigate:						
29	**Impact on connectivity across the road and disruption of access**					
30	**Health and safety risks for communities during construction**					
31	**Risk of improper behavior of security personnel**					
	Risks on road accident caused by speed along the road	**CC**	**SE**	**CC**	**Presence of a flagmen and women to control traffic movement at all times along the work site.** **Number of signs to warn drivers to reduce their speed.** **Installation of road signs at the centers/villages along**	**Costs Integrated in the BoQ**

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					the road. **Road signs shall be installed in all areas where works are going on.** **Measure adopted in the Contractor's Traffic management plan shall be implemented**	
	Safe passage at identified crossing sites for pedestrians with appropriate signage using pictograms and adequate protection from working machinery and vehicles and motorized traffic indicating diversion and entrance. Pedestrian crossings shall be separated from motorized vehicles crossings and shall be installed away from hazards. These shall be physically separated with barricades and construction fences to inhibit pedestrian movement into the work site. The contractor shall perform routine inspection of construction fences to ensure that they have	CC	SE	CC	Presence of a flagmen and women to control traffic movement at all times along the work site Presence of safe passages for pedestrians across work site in villages and towns Presence of barricades and construction fences to inhibit pedestrian movement into the work site Number of signs indicating danger/warning signs. Presence of a flagmen and	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	not fallen or been stolen and therefore replaced. Work site shall be clearly delineated and create exclusion zones. Work shall be confined to avoid that dangers spill out onto the sidewalks and streets around. Signage indicating danger using pictograms shall be installed along the work sites. Construction fences and work exclusion zones shall be visible at night, it is therefore required to use orange, fluorescent color for barricades and fences				women to control traffic movement at all times along the work site Construction fences and work exclusion zones shall be visible at night Number of complaints collected through the GRM Number of incidents and accidents involving community members shall be reported immediately to RE and WB. Measures adopted in the Contractor's Traffic management plan shall be implemented	
	All passages for pedestrians shall be universally accessible to allow people with physical disabilities to safely cross (using a wheelchair for example)	CC	SE	CC	Presence of a flagmen and women to control traffic movement at all times along the work site Accessibility to persons	5,000,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					living with disabilities Number of complaints collected through the GRM Measure adopted in the Contractor's Traffic management plan shall be implemented	
	Employment of flagmen and women to control traffic movement at all times along the work site to ensure to allow pedestrians to cross at designated locations	CC	SE	CC	Presence of a flagmen and women to control traffic movement at all times along the work site Measure adopted in the Contractor's Traffic management plan shall be implemented	Integrated in the BoQ
	Appropriate traffic control signs shall be installed along the main road, along detours	CC	SE	CC	Number of road signs along the construction site shall be installed. Measure adopted in the Contractor's Traffic management plan shall be implemented	5,000,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Prohibition of stockpiling materials close to pedestrian paths or close to residential areas and sensitive receptors schools	CC	SE	CC	Compliance with this measure by implementing C-ESMP. Number of complaints collected through the GRM are resolved. Measure adopted in the Contractor's Traffic management plan shall be implemented	Integrated in the BoQ
	Sensitization at schools along the road to show typical dangers associated with construction work and typical work signage to children (including the risk associated with arrester beds)				Consultation with schools' management and pupils as part of the Stakeholder Engagement Plan (SEP) Provide road safety awareness to schools and communities along the road. Minutes of meeting included in the SEP Decision (on safety Measure adopted in the Contractor's Traffic management plan	12,500,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					shall be implemented	
	Road safety awareness campaign for all workers focusing on community safety from work	CC	SE	CC	Provide road safety awareness to schools and communities along the road. Minutes of meeting included in the SEP Measure adopted in the Contractor's Traffic management plan shall be implemented	25,000,000 other costs are Integrated in the BoQ
	Terms the contracts for security personnel must be clearly established and the penalties for misuse of force must be stipulated in the contract. Contract shall include behavior commitments and clear and accessible disciplinary process as well as use of code of ethical conduct.	CC	SE and T/P	CC	Awareness on GBV/SEA issues shall be given to all workers including security personnel. Measure adopted in the Contractor's C-ESMP and GBV/SEA, LMP shall be implemented	Integrated in the BOQ
	Security personnel shall be required to sign the Workers Code of Conduct and shall take part of induction training and sensitization on the Code of Conduct, the GBV action	CC and T/P	T/P and SE	CC	Number of signed Workers Code of Conduct by security personnel. Awareness on GBV/SEA	Integrated in the BOQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	plan and the GRM. In addition, security personnel shall receive procedural training on procedures, proper conduct and ethics and human rights.				issues shall be given to all workers including security personnel. Percentage of security personnel that assisted in induction training on the Code of Conduct, the GBV action plan and the GRM Percentage of security personnel that assisted on training of procedures Number of complaints collected through the GRM Measures adopted in the Contractor's C-ESMP and LMP shall be implemented	
	Guards shall be hired from recognized private security companies and with a good reputation	CC	SE	CC	Proofs of experience of the company in charge of security and good reputation Number of complaints collected through the GRM	Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					the Contractor's C-ESMP and LMP shall be implemented	
	DIST GRM to be adapted to the local context	T/P	T/P	CC and SE	Operational GRM based on project context	Integrated in the BoQ
	Investigation for security-related allegations or incidents can include issues such as theft, abuse of power and retaliation, sexual harassment and exploitation, gender-based violence, and bribery and corruption	T/P, SE and CC	T/P, SE and CC	CC	Number of complaints collected through the GRM Number of investigations for security-related allegations Report on the allegations disclosed to TANROADS and the World Bank within 3 days after the investigation and immediately for GBV Measures adopted by the Contractor's C-ESMP and LMP shall be implemented	Integrated in the BoQ
Affected component: women						
Impact to mitigate:						
32	**Risk of additional workload burden on women when men are hired for construction work**					
	Measures are mainstream in other sections					

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
Affected component: vulnerable groups/persons						
Impact to mitigate:						
33	**Disturbance of persons living with disabilities due to loss of access during construction work**					
	Measures are mainstream in other sections					
Affected component: HIV and AIDS situation						
Impact to mitigate						
34	**Risks of Spread of HIV/AIDS and communicable diseases**					
	Mandatory recruitment training for workers on HIV and other STDs. All workers shall receive an induction training on this issue Recruitment of service providers to implement HIV/AIDS awareness campaigns	CC and T/P	SE and T/P	CC	Number of trainings upon recruitment of workers. Number of HIV/AIDS awareness campaigns given by Service provider. Measures adopted by the Contractor's HIV/AIDS Awareness programme shall be implemented.	50,000,000
	Identification of a registered service provider to test workers.	CC and T/P	SE and T/P	NA	Presence of a service provider to test workers Percentage of workers tested Measures adopted by the Contractor's HIV/AIDS Awareness programme shall	Include in the cost above

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					be implemented.	
	Access to Contractor's Campsite by outsiders shall be controlled	CC	SE	CC	Implementation of control at the workers camp entrance. Measures adopted by the Contractor's HIV/AIDS Awareness programme shall be implemented.	Integrated in the BoQ
	The recruited nurse at the contractor's campsite shall also be used to promote safe sex, sensitize workers on regular testing and shall provide information on the nearest health center to get tested. The nurse shall provide standard quality condoms to personnel on site	CC	SE	CC	Compliance with these measure Number of poster and brochures distributed to workers Measures adopted by the Contractor's HIV/AIDS Awareness programme and OHS risk management Plan shall be implemented.	7,500,000 other costs are Integrated in the BoQ
Affected component: child labor and forced labor						
Impact to mitigate:						
35	**Risk of child and forced labor**					
	Children under the age of 18 years shall not be hired on site as provided by Employment	CC	SE	CC	Contractor shall Comply with this Labor Law.	Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	and Labour Relations Act, 2004 Part II Sub-part A Child Labour. This includes hiring children to do chores at the workers camp such as cleaning rooms and working in the workers kitchen				Measures adopted in the Contractor's Labor Management Procedures shall be implemented	
	Introductory letter from LGAs for identification of all workers seeking for jobs from contractor's campsite. In the absence of papers, customary evidence shall be used to attest the age of the worker and ensure no any worker below 18 years is allowed to be recruited.	CC	SE	CC	Contractor shall Comply with this Labor Law. Measures adopted in the Contractor's Labor Management Procedures shall be implemented	Integrated in the BoQ
	Regular audits of workers conditions based on the DIST- Labor Management Procedures (LMP) shall be undertaken to verify workers' status	SE	SE	CC	Number of audits Number of noncompliance with DIST -LMP shall be recorded and restricted. Measures adopted in the Contractor's Labor Management Procedures shall be implemented	Integrated in the project cost for the SE
	In case of suspicion or proven cases of child labor and forced labor, the Supervising	SE	SE and T/P	CC	Number of cases of child labor and forced labor	Integrated in the project

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	engineer must ensure that TANROADS and the World Bank be formally informed				Number of reports on cases of child and forced labor disclosed to the World Bank and TANROADS. Measures adopted in the Contractor's Labor Management Procedures shall be implemented	cost for the SE
	Inspection and monitoring at quarry sites to ensure that no children and no forced labor are working in quarries	SE	SE	CC	Number of inspection and monitoring undertaken by ESHS Team on regular basis. Measures adopted in the Contractor's Labor Management Procedures and QSBPMP shall be implemented	Integrated in the project cost for the SE
Affected component: **labor risks and conditions**						
Impacts to mitigate:						
36	**Risk of poor labor conditions due to high level of informality**					
37	**OHS risks to workers**					
	Data log of all workers and implementation	CC	SE	CC	Presence of the data log for	Integrated in

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	of the procedures as set in the DIST -LMP to be adopted by the Contractor.				recruited workers. Percentage of workers recruited by contractor from local community. Measures adopted in Measures adopted in the Contractor's Labor Management Procedures shall be implemented	the BoQ
	Procedures to ban any form discrimination during workers recruitment	CC and SE	SE	CC and SE	Measures adopted in the Contractor's Labor Management Procedures and QSBPMP shall be implemented	Integrated in the BoQ
	Inspection and monitoring of workers recruitment procedures to ensure that no any workers recruited against established procures as per LMP. Follow up on the workers benefits and contribution as per labour law and LMP.	SE	SE	CC	Number of noncompliance with this measure as per LMP. Measures adopted in the Contractor's Labor Management Procedures and QSBPMP shall be implemented	2,500,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	The workers GRM shall be disclosed and accessible to all workers	CC	SE	CC	Measures adopted in the Contractor's Labor Management Procedures and QSBPMP shall be implemented	Integrated in the BoQ
	Work zone safety for construction workers at all times (use of protective barriers to shield workers from traffic vehicles in towns and village centers, use of traffic cones and barrels in rural areas, use of warning lights to avoid using flaggers). OHS induction training for all workers, topics to cover during training shall cover the requirements from the section 2.2 Communication and Training from the WBG Environmental, Health, and Safety General Guidelines, 2.0 Occupational Health and Safety. Mandatory PPE equipment for all workers (adapted to the type of work), including fluorescent vest for all workers. Presence on site of a full time dedicated	CC	SE	CC	Work safety zones are physically delineated at all time (cones, barrier, barrels). Number of induction training on OHS provided to workers Presence of PPE for all workers Presence of a full time Environmental, Social, Health and Safety (ESHS) Officers of the Contractor to ensure compliance with safety rules. The hazard identification and risk assessment method are included in the	12,500,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	qualified Environmental, Social, Health and Safety (ESHS) Officer of the Contractor (under the contractor payroll). Development and implementation by the contractor of a hazard identification and risk assessment that addresses all activities, routine and non-routine. This shall be done by contractor prior to beginning of work and shall cover all inherent risks associated with the construction site. Development of protocols and procedures by the contractor to detect COVID outbreaks through regular testing and isolation measures to reduce workers and community exposure to COVID and other communicable diseases. Protocols shall be compliant with the recommendations of the section 3.6 Disease Prevention from the WBG Environmental, Health, and Safety General Guidelines, 3.0 Community Health and Safety. all be compliant with the recommendations				Contractor's OHS risk Management Plan and Emergency preparedness plan are implemented accordingly. Ensure that ESHS staffs are equipped with OHS skills from OSHA. Protocols and procedures by the contractor to detect COVID outbreaks are included in the Contractor's OHS risk Management Plan Emergency preparedness plan is implemented accordingly. Protocols and procedures to respond to work related accidents are included in the Contractor's OHS risk Management Plan and implemented accordingly.	

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	of the section 3.6 Disease Prevention from the WBG Environmental, Health, and Safety General Guidelines, 3.0 Community Health and Safety. Development of protocols and procedures by the contractor to respond to work related accidents. Presence of first aid kits on site and a dedicated vehicle to drive injured workers to the nearest hospital. Availability of drinking water on work sites for all workers. Any injury, accident or near miss shall be described in a medical report by the contractor and Supervising engineer within one week of the injury. Use of millers and pavers with exhaust ventilation systems and proper maintenance of such systems to limit workers exposure to crystalline silica (millers and grinders) and asphalt fumes (pavers). Monitoring and record-keeping activities,				Presence of first aid kits on site and a dedicated standby ambulance in case of emergency. Standby nurse to attend any emergency on site. Presence of exhaust ventilation systems in millers and pavers Number of internal monitoring to be performed by the Contractor ESHS Staffs. Number of injuries, accidents and near misses are recorded and reported in accident record data sheet. All measures adopted in the Contractor's Labor Management Procedures and OHS risk Management Plan	

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	including inspection procedures designed to verify and record the effectiveness of prevention and control of exposure to occupational hazards. Monitoring shall be compliant with the method provided in the section 2.9 Monitoring from the WBG Environmental, Health, and Safety General **Guidelines, 2.0 Occupational Health and Safety.**				and implemented accordingly.	
	Contractor campsite shall comply with the recommendations from the section 2.1 General Facility Design and Operation from the WBG Environmental, Health, and Safety General Guidelines, 2.0 Occupational Health and Safety	CC and SE	SE	CC and SE	Contractors' campsite shall comply with the requirements of the section 2.1 of the EHS general guidelines Measures adopted in the Contractor's Labor Management Procedures and OHS risk Management Plan and Contractors campsite management plan are implemented accordingly.	Integrated in the BoQ
Affected component: Gender **(Gender-Based Violence)**						

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
Impact to mitigate:						
38	**Risk of an increase in Gender-Based Violence**					
	A GBV action plan is in place for the DIST (the GBV action plan is a standalone document that applies to all DIST projects). It contains a GBV-SEA GRM and a workers' Code of Conduct	T/P	T/P	NA	Measures adopted in the DIST-GBV action plan and GRM shall be implemented	2,500,000 other costs are Integrated in the BoQ
	GBV risk assessment and GBV mapping in the project area to inform risk mitigation strategies and update a GBV referral pathway	T/P	T/P	NA	Measures as stipulated into GBV/SEA shall be acknowledged by the contractors. Outcome of this risk assessment to be acknowledged in the Contractor's GBV action plan Measures adopted in the GBV/SEA action plan and GRM shall be implemented.	Integrated in the BoQ
	Training on the DIST GBV action plan and GRM. Supervising engineer and all contractors (including sub-contractors)	T/P	T/P	NA	Number of trainings given to the Supervising engineer and contractors' staffs on GBV.	10,000,000 other costs are

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	involved during construction shall be trained on this plan. They shall also be aware of their responsibility regarding these plans.				Measures adopted in the GBV/SEA action plan and GRM shall be implemented.	Integrated in the BoQ
	Induction training to all workers on the DIST GBV action plan and GRM, its requirements and the Code of Conduct and the use of the GBV grievance redress mechanism	CC/SE	T/P	CC/SE	Number of induction training provided to workers. Measures adopted in the GBV/SEA action plan and GRM shall be implemented.	2,500,000 other costs are Integrated in the BoQ
	Oversight of grievance handling and monitoring of the status and effective referral of GBV/SEA/SH complaints	T/P	T/P/	CC/SE	Number of complaints regarding GBV/SEA through GRM. Performance indicators are developed in the GBV action plan are observed. Measures adopted in the GBV/SEA action plan and GRM shall be implemented.	7,500,000 other costs are Integrated in the BoQ
	Separate facilities for men and women and display signs, posters and pamphlets around/along the project site that signal to workers and the community that the project	CC/SE	T/P	CC/SE	Compliance with these measures as provided into GBV/SEA and GRM. Percentage of workers that	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	site is an area where GBV/SEA is prohibited and enforce the Code of Conduct for all workers. The code of conduct to be signed by all workers				have signed the Code of Conduct. Measures adopted in the GBV/SEA action plan and GRM shall be implemented.	
Affected component: cultural heritage						
Impact to mitigate:						
39	**Risk of disturbances and destruction to unknown cultural heritage sites**					
	Risks of affecting the historical and heritage site along the road and Chance finds procedure during construction activities.	CC	SE	CC	Number of discoveries of Chance Finds Objects (CFO) Report on the procedure that was followed and clearance to resume work by the Antiquities expert from ministry of natural resources and tourism	2,500,000 other costs are Integrated in the BoQ
Mitigations to be implemented at Operation and maintenance phase						
Affected components: soils, surface water and groundwater, aquatic habitats and fish						
Impacts to mitigate:						
40	**Accumulation of pollutants in roadsides**					
41	**Infiltration of pollutants from roadsides in groundwater**					
42	**Impact on surface water quality from road traffic and surface runoffs**					

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
43	**Degradation of aquatic habitats from increase in road traffic and surface runoffs**					
	Appropriate signage to truck drivers to avoid littering. The design has foreseen to install drains with erosion checks which will reduce the silt load in streams, this mitigation is already integrated in the Project. TANROADS shall include as part of its maintenance plan, the removal of accumulated waste and silts in these drains and in culverts. Truck lay bays shall be equipped with garbage bins to collect domestic waste and waste collection at these bays shall be contracted to a service provider.	T/P	T/P	NA	Number of road signs to avoid littering Development of a maintenance plan that includes the need to remove accumulated waste and silts in drains and in culverts Number of garbage bins at truck bays and contract with a service provider for the removal of waste	Integrated in the TANROADS operation costs
Affected components: **noise level**						
Impact to mitigate:						
45	**Noise from traffic and reduction of noise due to road improvement**					
	Noise monitoring at baseline (prior to work) and after one year of operation	T/P	T/P	NA	Implementation of a noise monitoring campaign by a specialized consultant	

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Should the road cause noise level to unacceptable levels at sensitive sites such as health centers and schools, earthen mounds, or vegetation plantation to reduce nuisances could be envisaged at project implementation	T/P	T/P	NA	Number of complaints collected through the GRM Number of implemented measures to mitigate the effect of noise	Integrated in the TANROADS operation costs
Affected components: **air quality**						
Impact to mitigate:						
46	**Impact on air quality from road traffic and reduction of dust thanks to road improvement**					
	Reduction of the speed of vehicles in village centers to 50 km/hour as required in the Road Safety Screening and Appraisal Tool (RSSAT)	T/P	T/P	NA	Implementation of the speed limit in all villages crossed by the road	Integrated in the TANROADS operation costs
Affected components: livelihood and economic activities						
Impact to mitigate or enhance:						
49	**Improved transport sector allowing for economic development**					
50	**Livestock roadkill**					
	The risk of livestock roadkill is acknowledged in the Design report where provisions for livestock crossing were made. Selection of their locations shall be	T/P	T/P	NA	Number of livestock crossing implemented. Number of road signs mentioning livestock	Integrated in the TANROADS operation

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	based on exchanges with stakeholders				crossing Outcome of engagement activities with concerned livestock owners to be done as part of the SEP engagement activities	and maintenance costs
Affected components: community use of the road and safety aspects						
Impacts to mitigate or enhance:						
51	**Impact on connectivity across the road and disruption of access**					
52	**Risks of road safety impacts for motorized and non-motorized road users**					
53	**Risks of Accident and Health issues for population living along the road**					
54	**Risks of limiting the Universal access to the road and walkways**					
55	**Avoiding installing guardrails alongside side roads (that are used by community members) to maintain access for vehicles and non-motorized Risks on transportation disturbances and disruption. During the construction other road users will be disrupted to use road. If these side roads are deemed to be unsafe, the closure of their access from the trunk road shall be replaced by**	T/P	T/P	NA	Number of side roads maintained	Integrated in the TANROADS operation costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	another access					
	Additional engagement activities be undertaken at all villages that are crossed by the road to determine whether additional pedestrian crossings are necessary	T/P	T/P	NA	Number of consultations with affected communities as part of SEP engagement activities Minutes of meetings recorded Number of additional pedestrian crossings installed along the road	Integrated in the TANROADS operation costs
	The Total ESMP Implementation Costs		**Total ESMP Costs**		**Project ESMP direct Costs 267,500,000. Other related costs are included in Project BOQ during Construction.** **Other Costs during operation phase shall be borne within Institutional annual budget**.	

8.4.1 Potential Environmental and Social Impacts

Under World Bank's Environmental and Social Risk Classification (ESRC), this project is rated as substantial. The environmental risk rating is Substantial because of the impacts and risks associated with the large-scale infrastructure project and off-site facilities (such as borrow pits and quarry sites) may have sensitive environmental issues and risks and road safety issues due to the increase in vehicle speed and volume from the road improvements.

The Social risk is rated Substantial because the direct and indirect social risks and impacts associated with the large scale rehabilitation may entail significant adverse social impacts regarding: involuntary resettlement, labor and working conditions; failure to ensure inclusion of members of vulnerable groups (including persons with disabilities and women); lack of adequate stakeholder engagement; Gender-Based Violence/Sexual Exploitation and Abuse/Sexual Harassment (GBV/SEA/SH); and the transmission of HIV/AIDs, COVID-19 and other communicable diseases, associated with labor influx and the permanent project workforce, including project worker interactions with local communities.

The road development can cause a range of environmental and social impacts. However, given that this is a widening/rehabilitation project to dual carriageway, most impacts are expected to be minor to moderate as the project will be confined within the 45m and 60m of road construction corridor as per national regulations. All affected properties within the Construction corridor shall be compensated prior project execution. A standalone Resettlement Action Plan (RAP**)** has been prepared as part of this ESIA study to address the issues.

The widening/rehabilitation may involve risks inherent in all construction activities. Given the appropriate preventive measures, these can be mainly avoided. Negative impacts during operation are expected to be associated more with increased in traffic than with the road widening/rehabilitation itself. Expected impacts are both positive and negative in nature. Several positive impacts relate to the improvement of road safety, reduce time travel, reduce transport costs, and comfortability have been identified.

Potential and Positive Environmental and Social Impacts identified as follows.

a. **Potential to spur socio-economic growth:** Overall, the project will benefit both the urban and rural population along the trunk and regional roads in the two project host regions. Particularly, it will open and improve trade in mining and agricultural towns. It will also facilitate access of the population from production centres to markets and/or social services.
b. **Improved regional connectivity of other regions to the Capital City of Dodoma:** Dodoma is the capital city of Tanzania which needs several road connectivity to enable accessibility of peoples and goods. The proposed road is among the major roads that connect the central Tanzania with the test of the regions and has the potential transport requirements that contribute to the economic aspects of the regions and Tanzania as the whole.

c. **Contribute to improved agricultural production;** Dodoma region served with the project road have been experiencing high growth in recent years and are among the most fertile agricultural production areas in the country. The project interventions will enhance productivity through improved transportation thereby reducing on cost and time as well as create incentives for broader private sector participation to drive economic growth and generate wider economic benefits to the regions. Currently the road is in poor condition, and is vulnerable to natural hazards and climate change impacts;
d. **Open up new opportunities:** The road project is expected to contribute to the approximately 1000 local laborer's who will have new opportunities to be employed in the construction and services of the road project. This number does not include informal job opportunities such as food vendors, transporters as well as jobs created in the existing facilities (e.g., hotels, health centres, schools) in the vicinity of the project due to increased population because of job influx;
e. Improved road safety and security with NMT model: The project will provide segregated walkways at all populated areas along its length. The CBD road design consider other users (Pedestrians and cyclic) by providing provisional design of Non-Motorised Transport (NMT) road facilities along the road. The project will include pedestrians' walkways on both side of the road, cyclic lines on both side of the road, bus stops, side drains along the road, as well as overpass and underpass in all major junctions for safety management. In addition, there will be installation of new solar powered streetlights at selected populated areas and new road signs and road markings applied throughout the project. These measures are designed to promote non-motorized transportation (NMT) with a view to improve safety and security of the road users**;**
f. **Business opportunities for local suppliers and service providers:** The road construction activities involve a capital expenditure that requires a range of inputs comprising of machinery/plant and spares for plant and machinery, tyres for plant and machinery, gabions, concrete additives, reinforcement bars, posts and other consumables (wood formwork, bricks, cement, sand, aggregate, oils and lubricants) among others. The locals are optimistic that there will be business opportunities such as food vending and supply of firewood in the in the construction sites. They also requested that the vehicles for transport services be hired from the locals;
g. **Opportunity for knowledge and skills transfer:** Through staff interaction, the locals employed in the project will have an opportunity to learn from some of the specialised skilled and semi-skilled personnel that will be involved during the project construction. This may enhance their knowledge in construction of bitumen standard roads and associated facilities and their ability to access similar opportunities in future even beyond the county. The works will also invoke interest in youngsters to participate in such project in future and their career goals;

Contribute towards NTP's realization of a safe, reliable, efficient transport network: The proposed road will contribute towards the realization of the NTP's mission of developing a safe, reliable, effective and efficient transport network. The road project is geared towards addressing some of the key infrastructure bottlenecks (poor road network, poor drainage,

accident spots, poor or lack of road furniture amongst others) which very much impacts on integration of the network.

In additional the project will adopt the people centred approach design which consider other users (Pedestrians and cyclic) by providing provisional design of Non-Motorised Transport (NMT) road facilities along the road. The project will include pedestrians' walkways on both side of the road with trees planting for shedding, cyclic lines on both side of the road, bus stops with roof, open and covered side drains along the road, as well as overpass and underpass in all major junctions for safety management.

8.5 Summary of adverse impacts along the road project

Table 8.2: Summary of adverse impacts along the road project

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
Mitigations to be implemented at Project Mobilization						
Affected component: all components						
Impact to mitigate						
1	**Impacts on biophysical and socioeconomic components**					
2	**Resettlement of persons and displacement of assets**					
3	**Risk of GBV/SEA related to the compensation process**					
	Call for tenders and contracts for construction contractors shall include measures developed in the ESMP. In addition, some measures proposed in this ESMP involve a cost for the construction contractor, call for tender shall be clear on the requirement to quantify Social, health and safety measures and other measures in the Bills of Quantities (PPE, oil spill kit, etc.)	TANROADS	TANROADS	NA	Integration of applicable ESMP, HSMP and Sub-plans measures in tender and contracts	C-ESMP and Project costs
	Integration of appropriate ESHS wording in the tender documents for contractors. It is important to highlight in tender documents	TANROADS	TANROADS	NA	Integration of applicable ESMP, HSMP and Sub-plans	C-ESMP and Project costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	that in case of sensitive historical site, wetlands and watercourses) that would need to be protected from encroachment, deposition of demolition waste and rubbles and OHS risks to workers. It is also important to include requirement to ensure proper labor condition and protection against GBV/SEA. The framework ES instruments developed as part of DIST (such as the GBV action plan and the Labor Management Procedures) shall be included in tender and in contractual documents and the Labor Management Procedures) shall be included in tender and in contractual documents				measures in tender and contracts	
	Integration of detailed requirements in contractual documents for contractors and use of covenants in contracts. Covenants are formal obligations and prohibitions that the company must respect, they are not subject to interpretation	TANROADS	TANROADS	NA	Integration of applicable ESMP, HSMP and Sub-plans measures in tender and contracts	C-ESMP and Project costs
	Translation of ESMP and HSMP actions	TANROADS	TANROADS	NA	Integration of	C-ESMP and

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	into contractual terms so that ES requirements can be well understood by the contractors and that they know their responsibility upfront. Tender and contractual documents shall highlight that contractors are required to abide by the ESMP				applicable ESMP, HSMP and Sub-plans measures in tender and contracts	Project costs
	Integration of appropriate wording on the chain of responsibilities included in contractual document to ensure E&S and H&S measures are taken down to the contractors. This includes integrating in the contract the followings: Commitments for the contractor to comply with the EIA license, the WB-ESF and its ESSs, National laws, ratified conventions on E&S topics including labor conditions, child labor, and sexual harassment. Important definitions as presented in the ESIA -ESMP (GBV/SEA, LMP, GRM,	TANROADS	TANROADS	NA	Integration of applicable ESMP, HSMP and Sub-plans measures in tender and contracts	C-ESMP and Project costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	SEP) Clear chains of responsibilities (between TANROADS PIT, the contractor and the Supervising engineer) Explicit statement that the Contractor is responsible for the E&S performance of its Subcontractors (including primary suppliers) including compliance with labor laws The requirements for the ESHS Officer from the contractor (and under the payroll of the contractor). The requirements to participate in conflict resolution as part of the GRM, LMP and GBV allegations. Clear requirements regarding training and induction trainings. Requirements for reporting on ES performances Penalties in cases of outstanding E&S items and repeated violations of E&S requirements, full or partial payment under					

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	specific line items of the bill of quantities could be withheld, either temporarily or permanently based on the cost of compliance. Clear statement on the fact that contractor shall ensure that its subcontractors also comply with the ES requirements and the WB ESF.					
	Establishment of the management structure at TANROADS to supervise E&S and H&S aspects of the project as required in the Environmental and Social Commitment Plan (ESCP)	TANROADS	TANROADS	NA	PIT is already formulated and is currently operational	Integrated in ESMP project cost
	Environmental and social screening to ensure that selected quarries and sand pits do not cause any environmental damages to natural and sensitive habitats and do not present any risks for neighboring communities (a model is included in the ESMP)	Contractor ESHS staff	TANROADS-PIT and SE	NA	The check list presented in this ESMP is used to select quarries and borrow areas Absence of impact on ES components	See cost below
	A stand-alone Resettlement Action Plan (RAP) has been under prepararion to	TANROADS	TANROADS	TANROADS and LGAs	Implement the Resettlement Action	See RAP and Valuation

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	address all impacts and compensation related to the work. From preliminary RAP report noted the total of (3785) affected properties which belongs to the 887 PAPs will be affected along the road includes; houses, viosks, trees and crops along the RoW				Plan	report
	As required by the RAP promptly and timely compensations shall be paid to all PAPs who loss trees and crops along the road based on Tanzania laws and the World Bank ESS-5 on Land Acquisition, Restrictions on Land Use and Involuntary Resettlement before commencement of the construction activities.	TANROADS	TANROADS	TANROADS and LGAs	Implement the Resettlement Action Plan and ensure Compensation is paid before clearance of trees and crops and assistances to the Vendors and their assets and before the beginning of construction	Included into RAP and valuation report
	The DIST has developed among others the GRM instrument to solve all grievances related to compensation. Grievance Redress Mechanism (GRM) is in place to resolve all	Contractors ESHS staff.	TANROADS	TANROADS. LGAs	Implement the Resettlement Action The Grievance Redress Mechanism (GRM) is	Included into RAP and Valuation report

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	resettlement and compensation related grievances. As highlighted in the GRM, there will be open communication channels to register any complaints resulted from the project through established phone numbers and emails address as well as suggestion boxes at contractors, consultants, TANROADS regional Offices as well as Wards and Villages offices.				in place, communicated to all PAPs and operational	
	Sensitization of men on the use of compensation: when paying compensation, it is important to sensitize male heads of household on the use of compensation in order to prevent cases of dilapidation and GBV/SEA cases.	TANROADS	TANROADS	TANROADS	Measures integrated in the Resettlement Action Plan shall be implemented. Number of sensitization campaign to male/female PAPs	Included into RAP and valuation report
	Requirement that both spouse sign compensation agreements: signing of offset agreements and upstream negotiation processes should include women	TANROADS	TANROADS	TANROADS	Measures integrated in the Resettlement Action Plan shall be implemented. Number of	Included into RAP and valuation report

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					compensation sign-off with both spouse signatures	
	Assistance to open joint bank accounts during compensation. It is recommended, when paying compensation for household losses, to assist eligible persons to open a joint account that will be shared between men and women	TANROADS	TANROADS	TANROADS	Measures integrated in the Resettlement Action shall be implemented. Number of joint bank account opened for compensation payment	Included into RAP
	Prioritize compensation in kind for female heads of household.	TANROADS	TANROADS	TANROADS	Measures integrated in the Resettlement Action Plan shall be implemented Number of female heads of households that opted for in-kind compensation	Included into RAP and valuation report
Mitigations to be implemented at Construction phase						
Affected component: **Risks on Soil quality**						
Impacts to mitigate:						
4	**Impacts on soil quality from accidental spillage of oil and poor management of waste and sanitation**					

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
5	**Impacts on waste materials to be generated by the road project**					
	Good housekeeping shall be practiced within material storage compounds or vehicle maintenance yards where the possibility of spillage is great. This shall be done by installing spill tanks and secondary containment at vehicle maintenance yards.	Contractor	SE and TANROADS-PIT	Engineer, TANROADS, NEMC, Contractor, LGAs	Presence of spill tanks and secondary containment at vehicle maintenance yards Measure adopted in the contractor's Waste and hazardous material management plan shall be implemented.	3,000,000 and other Integrated in the BoQ
	Collection, separation and use of appropriate service providers for waste management	Contractor	SE and TANROADS-PIT	Engineer, TANROADS, NEMC, Contractor, LGAs	Presence of contract with waste service providers for all domestic and hazardous wastes including medical waste. Measure adopted in the contractor's Waste and hazardous material management plan shall be implemented.	3,000,000 and other costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Provision of sufficient waste bins at work site and workers camps and all off-site facilities. These shall allow for the separation of domestic nonhazardous waste and hazardous waste. Hazardous waste collection shall also be separated between medical waste and other hazardous wastes.	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Number of waste bins per type of waste. Measure adopted in the contractor's Waste and hazardous material management plan and C-ESMP shall be implemented.	2000,000 and other costs Integrated in the BoQ
	At the contractor campsite, rubbish containers shall be installed in a shelter on a wooden, metal, or concrete stand. Such containers must be emptied at regular intervals to avoid unpleasant odors associated with decaying organic materials	CC Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Presence of shelter and wooden, metal or concrete stands. Intervals of waste collection (every two days) Measure adopted in the contractor's Waste and hazardous material management plan and C-ESMP shall be implemented.	500,000 and other costs Integrated in the BoQ
	Hazardous wastes (liquid) shall be handled in designated area with concrete	Contractor	SE and TANROADS	Engineer, TANROADS,	Liquid hazardous waste collection in designated	500,000 and other costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	surrounding or containers around the workshop to avoid spillage. Collected liquid waste shall be managed by designated service providers for disposal			NEMC, Contractor, LGAs	areas on concrete. Presence of a service provider for liquid hazardous waste collection Measure adopted in the contractor's Waste and hazardous material management plan and C-ESMP shall be implemented.	Integrated in the BoQ
	Hazardous waste (solid) such as used batteries, filters, metal scrapers, used tiles, bitumen drums shall be collected and stored in the designated area. Collected solid waste shall be managed by designated service providers for disposal.	Contractor	SE and TANROADS	Contractor Engineer, TANROADS, NEMC, Contractor, LGAs	Solid hazardous waste collection in designated areas. Presence of a service provider for solid hazardous waste collection Measure adopted in the contractor's Waste and hazardous material management plan and	500,000 and other costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					C-ESMP shall be implemented.	
	Hazardous waste (medical) at the workers nursery shall be stored in biohazard containers and shall be managed in close collaboration with the nearest hospital	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Solid hazardous waste collection in biohazard containers and collected by the designated waste collector for disposal. Presence of a contract for waste transport and disposal with the nearest hospital. Measure adopted in the contractor's Waste and hazardous material management plan and C-ESMP shall be implemented.	500,000 and other Integrated in the BoQ
	Prohibition to burn any type of waste, this includes but is not limited to oil, plastic, tires, and domestic waste. Burying waste in the workers camp shall also not be	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Number of non-compliance with this measure. Covenant in the	Contractor ESMP

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	authorized				contractor's Waste and hazardous material management plan and C-ESMP shall be implemented.	
	Since there are no formal landfill in the vicinity of the road, non-dangerous waste that are generated at the workers camp (domestic waste) could be buried at a local dumpsite (in the absence of other alternatives). The selection of the dumpsite shall be done in close collaboration with district authorities. In addition, the Supervising engineer shall validate the choice of dumpsite based on several ES criteria: Distance of the dumpsite to residential areas. Distance of the dumpsite to the nearest watercourse. Absence of impact on watercourse. Absence of impact on groundwater.	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Written justification for the selection of the local dumpsite included in the construction work report based on the set criteria. Proofs of signature of an agreement with a waste collection company and the concern municipality. Measure adopted in the contractor's Waste and hazardous material management plan and C-ESMP shall be implemented.	Costs Integrated in the BoQ and ESMP

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Type of soil, it is preferable to select a site with impermeable soil and to avoid sandy areas. Overall management of the dumpsite (cleanliness, etc.).					
	Collection, separation, reuse and disposal of demolition waste: Bituminous waste shall be stockpiled for reuse at locations designated by the Supervising engineer. Disposal of demolition waste shall be done in accordance with clause 1713 of the Standard Specifications for Road Works 2000	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Location of bituminous waste stockpile. Compliance with clause 1713 of the Standard Specifications for Road Works 2000. Measures adopted in the Contractor's C-ESMP and implemented. Measure adopted in the contractor's Waste and hazardous material management plan shall be implemented.	500,000 other costs Integrated in the BoQ
	Collection and management of wastewater: The camp sites shall have adequate toilets	Contractor	SE and TANROADS	Engineer, TANROADS,	Contract with service provider for regular	1000,000 and other costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	with septic tank. A contract with a service provider shall be established for regular maintenance and regular emptying. Septic tanks shall be installed in areas of stable soils that are nearly level, well drained, and permeable, with enough separation between the drain field and the groundwater table or other receiving waters. Mobile toilets shall be available to workers when working on the road sections. A contract with a service provider shall be established for regular maintenance and regular emptying			NEMC, Contractor, LGAs	maintenance and emptying of the septic tank. Location of the septic tank validated by the SE. Mobile toilets and contract with service provider for regular maintenance and regular emptying Measure adopted in the contractor's Waste and hazardous material management plan and Contractor's campsite management plan shall be implemented.	Integrated in the BoQ
	Refueling shall be done in designated areas with minimal risk of collision with other vehicles. Small refueling stations and oil barrels must	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Selection of refueling areas validated by the SE. Refueling station on	500,000 and other costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	be on impermeable surfaces with controlled drainage (drip trays to collect small spillages). All fuel bowser (trucks) shall have a certified spill response kit with granular absorbent, bags and containers to remove polluted earth in case of spills. All workers handling fuel shall have proper training on the correct transfer and handling of fuels and chemicals and the response to spills. In case of small oil spills, granular absorbent shall be put on the spill. The contaminate earth shall be excavated and sealed in bag to be sent to appropriate treatment plants. Contaminated soil shall not be sent to municipal dumpsites. In case of large oil spills, the spill shall be contained and the site isolated with fences. The appropriate agency shall be contacted for guidance, and contaminated soil shall be excavated and transported to the designated treatment facility.				impermeable surfaces with control drainage. Fuel bowser with certified spill response kit Number of small oil spills that were treated with spill response kit. Number of large oil spills and report and the corrective measure implemented. Waste and hazardous material management plan and Contractor's campsite management plan shall be implemented. Measures adopted in the contractor's Emergency Preparedness and Response Plan (EPRP)	

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	o municipal dumpsites. In case of large oil spills, the spill shall be contained and the site isolated with fences. The appropriate agency shall be contacted for guidance, and contaminated soil shall be excavated and transported to the designated treatment facility.				and C-ESMP shall be implemented.	
	Installation of secondary containment for fuel storage tanks and for the temporary storage of other fluids such as lubricating oils and hydraulic fluids.	Contractor	SE and TANROADS	Contractor Engineer, TANROADS, NEMC, Contractor, LGAs	Presence of secondary containment for fuel for all storage tanks Measure adopted in the contractor's Waste and hazardous material management plan and C-ESMP shall be implemented.	Integrated in the BoQ
	Confinement of work within the RoW of 60m corridor that will be compensated and avoidance of unnecessary encroachment	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Number of noncompliance with this measure by the CC Measure adopted in the Contractor's C-ESMP shall be implemented.	No cost

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
Affected component: **Risks related to hydrology, water quality and aquatic habitats and fish**						
Impacts to mitigate:						
6	**Impact on hydraulic transparency from construction, modification of aquatic habitats from widening of culverts and impact on ecological continuity of aquatic habitat from culvert replacement**					
7	**Impact on surface water quality during construction with expected increase of turbidity**					
8	**Impact of accidental spillage of oil and concrete wash water on surface water quality**					
9	**Disturbance of aquatic habitats and fish from water abstraction**					
	When replacing or widening culverts: Installation of new culverts partially under the riverbed level to avoid creating perched culverts (that would block free movement of fish) and shall not have a steep slope to avoid increasing flow to a point where some fishes can no longer swim. For all works on arched metal culverts and box culverts, the contractor shall develop in its Construction-ESMP, a method for water work to ensure that free flow of water is not impacted, that material is not deposited in the streams and wetlands, and that turbidity of water does not increase. of water does not increase.	Contractor	SE and TANROADS, water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Percentage of culvert replaced during the dry season Number of culverts that were cleaned prior to widening/rehabilitation. Percentage of new culverts that are installed partially under the riverbed. Measures adopted in the Contractor's C-ESMP shall be implemented. The C-EMSP and	Integrated in the BoQ (including pumps and silt fences)

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Work shall be done preferably during the dry season. If it is not possible, installation of pumps or temporary diversions shall allow water to flow downstream of work. This is also key to avoid all impacts on downstream and upstream croplands that are dependent on water. Given the permanent presence of water in the box culverts, all work at these locations shall use diversion pumps and temporary enclosures to work in a dewatered environment. This measure is particularly important at locations where arched metal pipes will be fully replaced by larger box culverts. etal pipes will be fully replaced by larger box culverts. During work on permanent streams, (especially at box culverts location), silt fences shall be installed downstream of work to avoid increasing turbidity of stream. Removal of all obstacles to free flow (rock,				design report includes a detailed method for culvert replacement work.	

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	plant debris, waste) before replacement of culverts.					
	Local drainage and runoff flow patterns shall be maintained on the construction site to avoid creating local flooding or drought that could affect crops.	Contractor	SE and TANROADS, water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Number of complaints from nearby farmers doing small scale irrigation and recession agriculture. Verification by the SE of work at all culvert site to ensure that hydraulic transparency is maintained and that there is no impact on nearby agriculture. Measure adopted in the Contractor's C-ESMP shall be implemented.	Costs Integrated in the BoQ
	Excavated material storage sites must never be done close to a watercourse to avoid impede the free flow of water or create bottlenecks. Selection of storage sites far from any	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Verification by the SE of work at all culvert site to ensure that no excavated material is stored close to a	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	watercourses and wetlands.				waterbody. Measure adopted in the Contractor's C-ESMP shall be implemented.	
	During replacement of culverts, the need for derivation roads shall be determined. If necessary, derivation roads shall not ford cross the watercourses (even during the dry season) and the crossing shall use temporary culverts that are size to ensure free flow of water. Abutments at these temporary crossing shall be stabilized with geotextile membrane and riprap rocks.	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Method for full culvert replacement avoiding the need for derivation road and to ford cross the waterbody. Measure adopted in the Contractor's C-ESMP shall be implemented. Presence of temporary culverts sized to guarantee free flow of water. Abutment are stabilized with geotextile and rocks Measure adopted in the Contractor's C-ESMP	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					shall be implemented.	
	Refueling of engines or transfer of materials should not be carried out near water bodies, and any local spillage shall immediately be remedied. When working close to watercourses: Installation of silt fences upstream and downstream of work site to retain suspended solids. Installation of temporary slope stabilization measures during construction such as sediment diverting or catchment basins. All machinery working close to a waterbody shall have certified emergency spills containment which include silt floating and oil spill containment booms. A skimmer to suck up the contained spill shall also be foreseen on site. In case of minor spills, the contained waterborne spills shall be sucked with a skimmer up to remove the oil from water. The collected oil shall be sent to a	Contractor	SE and TANROADS, water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Presence of silt fences upstream and downstream of work. Presence of temporary slope stabilization measures during construction such as sediment diverting or catchment basins. Certified emergency spills containment in all machinery. Measures adopted in the contractor's Emergency Preparedness and Response Plan (EPRP) shall be implemented. Measure adopted in the Contractor's Erosion	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	treatment facility and shall not be discharged on soil. atment facility and shall not be discharged on soil. An Emergency Preparedness and Response Plan (EPRP) shall be developed to prevent and address minor and major spills, which would require to mobilize necessary resource to maintain and clean the spill.				and Sediment Control Plan shall be implemented.	
	Avoidance of all discharge of concrete wash water in waterbodies or on the ground. Temporary washout containers shall be installed to allow wash water to evaporate. The hardened cementitious solids could then be recycled.	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Number of cases of discharge of concrete wash water in a waterbody. Presence of temporary washout containers to allow water to evaporate Recycling of the hardened cementitious solids Measure adopted in the Contractor's C-ESMP	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					shall be implemented.	
	When removing culvert wingwalls, machinery shall not work from the stream and shall avoid all encroachment. The culvert embankment shall be rapidly stabilized upstream and downstream with riprap or gabion in addition to the new wingwall to avoid leaving bare soil and erosion of the banks.	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Avoidance of work from the stream. Stabilization directly after work with riprap or gabions. Measure adopted in the Contractor's C-ESMP shall be implemented. Measure adopted in the Contractor's Erosion and Sediment Control Plan shall be implemented.	Costs Integrated in the BoQ
	At the contractor's campsite, grey water or wastewater shall never be discharged in a natural waterbody but be collected in skeptic tanks to avoid discharge in natural ditches and in watercourses.	Contractor	SE and TANROADS	Engineer, TANROADS, NEMC, Contractor, LGAs	Measure adopted in the contractor's Workers' camp management plan shall be implemented.	Costs Integrated in the BoQ
	Obtainment of a water right before any	Contractor	SE and	Engineer,	The water right shall be	Costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	abstraction of construction water in the project area.		TANROADS, Water Authority	TANROADS, NEMC, Contractor, LGAs	obtained from the authority Measure adopted in the Contractor's C-ESMP shall be implemented.	Integrated in the BoQ
	Regardless of their suitability for water, small streams shall be avoided due to little baseflow.	Contractor	SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Selection of the water sources for construction that complies with this condition. Boreholes shall be established as sources of water for construction after acquiring water permit. Measure adopted in the Contractor's C-ESMP shall be implemented.	Costs Integrated in the BoQ
	Groundwater from boreholes shall be favored as a source of water for	Contractor	SE and TANROADS,	Engineer, TANROADS,	Percentage of groundwater used for	Costs Integrated in

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	construction. Borehole's location shall be selected to avoid impact on private wells. Permit for water obstruction shall be acquired.		Water Authority	NEMC, Contractor, LGAs	concrete production. Measure adopted in the Contractor's C-ESMP shall be implemented.	the BoQ
Affected component: **Risks of noise level and vibration**						
Impact to mitigate:						
10	**Increase in noise level and vibration**					
	When working close to residential areas and in villages, work shall be undertaken during daytime only.	Contractor	SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Compliance with this measure. Measure adopted in the Contractor's C-ESMP shall be implemented.	2,000,000 other costs are Integrated in the BoQ
	Avoidance of idling the engines. Machinery shall also be serviced regularly to avoid unnecessary noise and air pollution.	Contractor	SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Certificate or proof of maintenance Compliance with the avoidance of engine idling Measures adopted in the Contractor's C-ESMP shall be	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					implemented.	
	Use of certified absorbent noise barrier to limit nuisances for nearby communities whenever possible. Such noise barriers could be used around generators and stationary engines.	Contractor	SE and TANROADS,	Engineer, TANROADS, NEMC, Contractor, LGAs	Presence of absorbent noise barriers around stationary engines and the generators Measures adopted in the Contractor's C-ESMP shall be implemented.	Costs Integrated in the BoQ
	Communication of the schedule and duration of work to affected communities and at location where there are sensitive receptors (such as schools, hospitals and places of worship). If needed, schedule of work could be adapted based on collected feedback and close to these sensitive receptors	Contractor	SE and TANROADS,	Engineer, TANROADS, NEMC, Contractor, LGAs	Number of engagement activities as part of the DIST Stakeholder Engagement Plan held to present the calendar of work.	Costs Integrated in the BoQ
Affected component: **Risks of noise level and vibration**						
Impact to mitigate:						
11	**Emission of air pollutants from machinery and trucks**					
	Dust from work sites in village and town centers shall be reduced. This includes	Contractor	SE and TANROADS,	Engineer, TANROADS,	Number of time water is sprayed in residential	6,000,000 and other

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	spraying the access to the construction site and other off-site facilities (quarries). The frequency of sprinkling shall be increased during the dry season.		Water Authority	NEMC, Contractor, LGAs	areas and at quarries per day. Querry site shall be installed with water sprinkle for dusts control. Regular watering suppression by water bowsers to control dusts along the road. Undertaking regular monitoring of dust levels to check on standard limits. Measures adopted in the Contractor's C-ESMP and QSBPMP shall be implemented.	costs Integrated in the BoQ
	The use of water to suppress dust shall not be done at the expense of sensitive aquatic habitats and sources of domestic water. Location for water abstraction shall be	Contractor	SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Contractor shall identify and drill his own Boreholes as the sources of water after	2,000,000 other costs are Integrated in

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	validated by the Supervising engineer.				acquiring water permit from the authority. As part of reducing conflicts and pressure on water use with communities, the water from rivers shall not be used for construction activities. Validation of all water abstraction sites by the Supervising engineer	the BoQ
	Vehicles maintenance: vehicles and trucks will be verified and serviced on a regular basis, especially oil changes in vehicles, trucks and machinery to avoid unnecessary air pollution from exhausts. All trucks transporting material shall be covered (including trucks travelling to and from quarries and borrow areas).	Contractor	SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Frequency of truck and vehicle maintenance Proof of maintenance of all vehicles and trucks. Number of trucks with cover Measures adopted in the Contractor's C-ESMP shall be	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					implemented.	
	The selection of the asphalt batch plant location shall be done in consultation among TANROADS, local government authorities, customary authorities, and the contractor to ensure that it does not lead to local nuisances. It shall be located at a suitable distance from households.	Contractor	SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Distance between the asphalt batch plant and the nearest house. Number of complaints collected through the GRM	Costs Integrated in the BoQ
Affected component: terrestrial habitats and wetlands and associated flora						
Impacts to mitigate:						
12	**Loss of roadside terrestrial and wetland habitats**					
13	**Destruction or disturbance of habitats at raw material extraction sites and off-site facilities**					
	Work and storage of spoils and machinery shall remain within the existing road reserve. Contractors to commit to maintaining all works within set boundaries to avoid unnecessary impact on habitats and historical site.	Contractor	SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Compliance with this measure. Measures adopted in the Contractor's C-ESMP shall be implemented.	5,000,000 other costs are Integrated in the BoQ
	In order to limit all work within set boundaries, and to manage off-site impacts, the contractor shall request the Supervising	Contractor	SE and TANROADS, Water	Engineer, TANROADS, NEMC,	Compliance with this measure. Measure adopted in the	No cost

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	engineer whenever additional land is temporarily required along the road.		Authority	Contractor, LGAs	Contractor's C-ESMP shall be implemented.	
	Once exact locations of quarries are known, prior ecological survey shall be undertaken to delineate sensitive habitats and the Quarry and Borrow Pits Management Plan shall be prepared to determine potential impacts on habitats and possibly to recommend avoidance measures. The outcome of this survey and QSBPMP shall be submitted and communicated to the Supervising engineer, the contractor and TANROADS to assist in the decision making and follow up. Refer to the Environmental and Social Check List for all additional land requirement (quarry/borrow areas, workers camps, work sites. dditional land requirement (quarry/borrow areas, workers camps, work sites.	Contractor	SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Ecological survey is done for all quarries and borrow areas to assist in the decision-making Decision adopted in the Contractor's C-ESMP shall be implemented Contractor to develop and implement a Borrow Pits and Quarry Sites Operation and Reinstatement Plan (QSBPMP)	40,000,000 other costs are Integrated in the BoQ
	Reinstatement of quarries and borrow areas to minimize any ongoing impacts on	Contractor	SE and TANROADS,	Engineer, TANROADS,	All quarries at their end of life are reinstated	25,000,000 other costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	habitats. This includes removing all unnecessary rubble and removing all machinery and oil barrels and softening the slopes of quarry of borrow areas. Consultation with local authorities, shall be done to determine the fate of disused borrow areas		Water Authority	NEMC, Contractor, LGAs	and the restoration is validated by the RE as per approved Quarry site and Borrow Pits Plan (QSBMP) Measure adopted and implemented in the Contractor's Borrow Pits and Quarry Sites Operation and Reinstatement Plan	are Integrated in the BoQ
Impacts to mitigate:						
Affected component: **Ecological plant species**						
Impact to mitigate:						
18	**Risk of destruction of Ecological plant species**					
	All work sites and campsite shall be located in brownfields, in areas already disturbed by past activities in Dodoma city	Contractor	SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	The selection of areas for contractor's campsite shall comply with all measures proposed in this ESIA and other ES subplans. Measure adopted in the	Integrated into project costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					Contractor's C-ESMP and Campsite management Plan shall be implemented	
	For all additional land requirement (outside of the existing road reserve of 60m), the selection of site be preceded by an ecological survey and preparation of ESMP and QSBPMP to determine potential impacts on habitats and possibly to recommend avoidance measures. The outcome of this survey shall be communicated to the Supervising engineer, the contractor and TANROADS for follow up and guidance. Refer to the Environmental and Social Check List for all additional land requirement (quarry/borrow areas, workers camps, work sites).	Contractor	SE and SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Ecological survey and Quarry site and Borrow Pits Management Plan (QSBPMP) shall be undertaken for all additional land requirement for borrow pits and query site. Decision adopted in the Contractor's C-ESMP and (QSBPMP) shall be implemented RAP and valuation shall be prepared and implementated in case there will be any land additional for project	Integrated into project costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					activities	
Affected component: **Risks on Alien and invasive plant species**						
Impact to mitigate						
20	**Risk of spread of alien and invasive plant species**					
	Cleaning of machinery before commencement of work to ensure that no mud is transported to the site. Cleaning machinery shall also be performed when working close to watercourses. Lastly, all earth spoils shall be rapidly reused or covered to avoid colonization by invasive plants	Contractor	SE and TANROADS,	Engineer, TANROADS, NEMC, Contractor, LGAs	Machinery is clean before commencement of work Spoils are covered rapidly Measures adopted in the Contractor's C-ESMP and Workshop Management Plan shall be implemented	costs Integrated in the BoQ
Affected component: **Population distribution and settlement pattern along the road**						
Impacts to mitigate:						
21	**Possible additional temporary and permanent restrictions on land use during construction**					
22	**Socioeconomic impacts on displaced persons**					
	For all additional land, the willing-buyer willing-seller approach shall be verified	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs	Written minutes to confirm existence of the negotiation and consultation with	Cost Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					landowners and documentation on the land acquisition process. Confirmation that the land that was sold was not under any form of rental. Compensation is done in accordance with the RPF (and Project RAP).	
	Development of land pre-entry and exit procedures and agreements with landowners and affected communities before the commencement of construction activities (and integrate these procedures and compensations in the RAP and its entitlement matrix). These procedures shall include restoring cultivated land to allow livelihood activities to resume after work. Land pre-entry and exit procedures and	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs	Integration of the land pre-entry and exit procedures before work Mobilization of a project land acquisition team on the ground to reach agreement for temporary access during construction	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	agreements shall be reach with the owners of land by TANROADS using the same entitlement matrix and compensation thresholds as in the RAP, negotiation with land and asset owners are under the responsibility of TANROADS and shall not be done by the contractor. This will require the mobilization of a project land acquisition team on the ground to reach agreement for temporary access during construction. esholds as in the RAP, negotiation with land and asset owners are under the responsibility of TANROADS and shall not be done by the contractor. This will require the mobilization of a project land acquisition team on the ground to reach agreement for temporary access during construction.					
	All crops and properties that will be accidently damaged by operating vehicles, equipment and machinery and vibration	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs	Number of accidental damages Number of	Costs included into ESMP

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	during construction activities shall be compensated by the Contractor using the RAP entitlement matrix and compensation thresholds in consultation with TANROADS				compensations paid Number of collected grievances Measure adopted in the Contractor's C-ESMP and RAP shall be implemented	
	Temporary access to businesses during construction work shall be maintained by the contractor	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs	Compliance with this measure Measure adopted in the Contractor's C-ESMP and Livelihood Restoration Plan shall be implemented	Costs Integrated in the BoQ
Affected component: social indicators						
Impacts to mitigate:						
23	**Impacts on Worker's influx, workers camp and associated social impacts on communities**					
24	**Strain on local services such as health services, water supply, waste management and electricity from the presence of work and workers**					
	Selection of campsite's locations through collaboration and consultation between TANROADS, local government authority,	Contractor	SE and TANROADS, Water	Engineer, TANROADS, NEMC,	Consultation with stakeholders as part of the Stakeholder	Costs Integrated in the project

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	customary authorities and contractor to minimize any possible environmental and social risks to communities and ecological areas along the road Consultations and information disclosure are held on a regular basis with local communities concerned by the proposed campsite		Authority	Contractor, LGAs	Engagement Plan (SEP) Minutes of meeting included in the SEP Number of complaints collected through the grievance redress mechanism (GRM) Campsite Management Plan and C-ESMP shall be implemented.	cost
	Contractors' campsite shall be designed to prevent contamination of any water body, to ensure hygiene and to avoid the proliferation of mosquitoes, flies and rodent	Contractor	SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Collection of all grey or wastewater from the campsite by the authorized waste dealers to the area allocated for emptying waste water. Measure adopted in the Contractor's C-ESMP shall be implemented Measures adopted in	Costs Integrated into BOQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					the contractor's campsite Management plan shall be implemented	
	Workers' Code of Conduct shall be enforced to ensure that all workers behave in a respectful manner and to avoid all conflicts with local communities and GBV	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs	DIST Workers Code of Conduct, LMP, GBV/SEA shall be adopted and implemented. Number of complaints collected through the grievance redress mechanism (GRM) and measures undertaken.	Costs Integrated into BOQ
	The establishment of Contractors campsite should not lead to pressure on public services such as drinking water, electricity and health care. Disclosure to local public services the needs generated by the Contractors campsite and the construction site and coordinate the	Contractor	SE and TANROADS, Water Authority	Engineer, TANROADS, NEMC, Contractor, LGAs	Consultation with stakeholders as part of the Stakeholder Engagement Plan (SEP) The contractor shall drill boreholes for	Costs Integrated into BOQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	implementation of measures to prevent pressures on public infrastructure from having negative consequences on local communities (hospitals, roads, electricity consumption, water intake). The construction contractor will have to study these risks and will have to set up its own services such as a first aid center and source of water. isks and will have to set up its own services such as a first aid center and source of water.				extraction of water for construction activities. Minutes of meeting included in the SEP Measures adopted in the contractor's Campsite Management Plan, Workers Code of Conduct, LMP, GBV/SEA shall be adopted and implemented.	
	TANROADS in collaboration with utility companies (TANESCO and TTCL) will be responsible for relocation of utilities and this will be done before commencement of construction works. If temporary closure of water utilities is unavoidable, early notice shall be given to the community before removal and relocation of water utilities and alternative temporary domestic water supply	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs	Consultation with utility companies as part of the Stakeholder Engagement Plan (SEP) Minutes of meeting included in the SEP Measures adopted in the Contractor's ESMP	No cost

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	shall be established				shall be implemented	
Affected component: **livelihood and economic activities**						
Impacts to mitigate:						
25	**Disturbances to livelihood and economic activities**					
26	**Disturbance of local traffic, mobility and congestion impacting economic activities**					
27	**Reduction of available water from perennial rivers used for irrigation and domestic use for villages along the road**					
28	**Job opportunities**					
	Compensations and relocation of affected PAPs about and Properties as part of the RAP implementation				stand-alone RAP and valuation documents shall be in place	
	Public consultation with farmers that use water from all the identified rivers across the road project. This consultation shall aim at determining the volume that could be abstracted without impacting downstream agriculture. Collected information shall assist in the decision making. Depending on the severity of the impact, alternative sources shall be found or compensation shall be paid to affected farmers, in line with the RAP and its entitlement (refers to RAP of the report)	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs	Consultation with affected farmers as part of the Stakeholder Engagement Plan (SEP). Contractor shall drill his own boreholes as source of water for construction activities. No water shall be allowed to be fetched by the contractor from	Costs Integrated in the project cost

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					rivers across the road project. Minutes of meeting included in the SEP Measures adopted in the Contractor's ESMP shall be implemented	
	Risks on road accident to road users	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs, Traffic police	Installment of road signs in all areas identified as blackspots. Installation of the road signs in all areas where construction activities are taking place. Public awareness on road safety shall be undertaken regularly. Contractor to develop and implement Traffic Management plan	15,000,000 other costs are Integrated in the BoQ
	Jobs to be granted for local people must be	Contractor	SE and	Engineer,	Number of workers	Costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	negotiated based on the adopted LMP by the Contractor. All jobs that fit for local communities shall be identified and communicated to their local authority for transparent way of engagement.		TANROADS,	TANROADS, Contractor, LGAs,	engaged from local communities during the construction phase. Measures adopted in the Contractor's Labor Management Procedures shall be implemented	Integrated in the BoQ
	Off-site recruitment center to jobs to be capture by local residents, prioritizing permanent residents of neighboring communities.				Measures adopted in the Contractor's Labor Management Procedures shall be implemented	Costs Integrated in the BoQ
	The contractor shall strive to source materials, equipment and services that can be provided by local suppliers	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Measures adopted in the Contractor's ESMP shall be implemented	Costs Integrated in the BoQ
Affected component: community use of the road and safety aspects						
Impacts to mitigate:						
29	**Impact on connectivity across the road and disruption of access**					
30	**Health and safety risks for communities during construction**					
31	**Risk of improper behavior of security personnel**					
	Risks on road accident caused by speed	Contractor	SE and	Engineer,	**Presence of a flagmen**	**Costs**

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	along the road		TANROADS,	TANROADS, Contractor, LGAs, Traffic police	**and women to control traffic movement at all times along the work site.** **Number of signs to warn drivers to reduce their speed.** **Installation of road signs at the centers/villages along the road.** **Road signs shall be installed in all areas where works are going on.** **Measure adopted in the Contractor's Traffic management plan shall be implemented**	**Integrated in the BoQ**
	Safe passage at identified crossing sites for pedestrians with appropriate signage using	Contractor	SE and TANROADS,	Engineer, TANROADS,	Presence of a flagmen and women to control	Costs Integrated in

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	pictograms and adequate protection from working machinery and vehicles and motorized traffic indicating diversion and entrance. Pedestrian crossings shall be separated from motorized vehicles crossings and shall be installed away from hazards. These shall be physically separated with barricades and construction fences to inhibit pedestrian movement into the work site. The contractor shall perform routine inspection of construction fences to ensure that they have not fallen or been stolen and therefore replaced. Work site shall be clearly delineated and create exclusion zones. Work shall be confined to avoid that dangers spill out onto the sidewalks and streets around. Signage indicating danger using pictograms shall be installed along the work sites. Construction fences and work exclusion zones shall be visible at night, it is therefore			Contractor, LGAs, Traffic police	traffic movement at all times along the work site Presence of safe passages for pedestrians across work site in villages and towns Presence of barricades and construction fences to inhibit pedestrian movement into the work site Number of signs indicating danger/warning signs. Presence of a flagmen and women to control traffic movement at all times along the work site Construction fences	the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	required to use orange, fluorescent color for barricades and fences. along detours and at all road junctions in Bunge, Shabiby, and Meliwa				and work exclusion zones shall be visible at night Number of complaints collected through the GRM Number of incidents and accidents involving community members shall be reported immediately to RE and WB. Measures adopted in the Contractor's Traffic management plan shall be implemented	
	All passages for pedestrians shall be universally accessible to allow people with physical disabilities to safely cross (using a wheelchair for example)	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs, Traffic police	Presence of a flagmen and women to control traffic movement at all times along the work site Accessibility to persons	5,000,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					living with disabilities Number of complaints collected through the GRM Measure adopted in the Contractor's Traffic management plan shall be implemented	
	Employment of flagmen and women to control traffic movement at all times along the work site to ensure to allow pedestrians to cross at designated locations along detours and at all road junctions in Bunge, Shabiby, and Meliwa	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor,LGAs, Traffic police	Presence of a flagmen and women to control traffic movement at all times along the work site Measure adopted in the Contractor's Traffic management plan shall be implemented	Integrated in the BoQ
	Appropriate traffic control signs shall be installed along the main road, along detours and at all road junctions in Bunge, Shabiby and Meliwa	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs, Traffic police	Number of road signs along the construction site shall be installed. Measure adopted in the Contractor's Traffic	5,000,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					management plan shall be implemented	
	Prohibition of stockpiling materials close to pedestrian paths or close to residential areas and sensitive receptors schools	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs, Traffic police	Compliance with this measure by implementing C-ESMP. Number of complaints collected through the GRM are resolved. Measure adopted in the Contractor's Traffic management plan shall be implemented	Integrated in the BoQ
	Sensitization at schools along the road to show typical dangers associated with construction work and typical work signage to children (including the risk associated with road crossing along at all road junctions in Bunge, Shabiby and Meliwa	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor ,LGAs, Traffic police	Consultation with schools' management and pupils as part of the Stakeholder Engagement Plan (SEP) Provide road safety awareness to schools and communities along	15,000,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					the road. Minutes of meeting included in the SEP Decision (on safety Measure adopted in the Contractor's Traffic management plan shall be implemented	
	Road safety awareness campaign for all workers focusing on community safety from work at all road junctions in Bunge, Shabiby and Meliwa	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs, Traffic police	Provide road safety awareness to schools and communities along the road. Minutes of meeting included in the SEP Measure adopted in the Contractor's Traffic management plan shall be implemented	5,000,000 other costs are Integrated in the BoQ
	Terms the contracts for security personnel must be clearly established and the penalties for misuse of force must be stipulated in the contract. Contract shall include behavior	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor LGAs, police force	Awareness on GBV/SEA issues shall be given to all workers including security	Integrated in the BOQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	commitments and clear and accessible disciplinary process as well as use of code of ethical conduct.				personnel. Measure adopted in the Contractor's C-ESMP and GBV/SEA, LMP shall be implemented	
	Security personnel shall be required to sign the Workers Code of Conduct and shall take part of induction training and sensitization on the Code of Conduct, the GBV action plan and the GRM. In addition, security personnel shall receive procedural training on procedures, proper conduct and ethics and human rights.	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor LGAs, police force	Number of signed Workers Code of Conduct by security personnel. Awareness on GBV/SEA issues shall be given to all workers including security personnel. Percentage of security personnel that assisted in induction training on the Code of Conduct, the GBV action plan and the GRM Percentage of security	Integrated in the BOQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					personnel that assisted on training of procedures Number of complaints collected through the GRM Measures adopted in the Contractor's C-ESMP and LMP shall be implemented	
	Guards shall be hired from recognized private security companies and with a good reputation	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor LGAs, police force	Proofs of experience of the company in charge of security and good reputation Number of complaints collected through the GRM the Contractor's C-ESMP and LMP shall be implemented	Integrated in the BoQ
	DIST GRM to be adapted to the local context	Contractor	SE and TANROADS,	Engineer, TANROADS,	Operational GRM based on project	Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
				Contractor LGAs, police force	context	
	Investigation for security-related allegations or incidents can include issues such as theft, abuse of power and retaliation, sexual harassment and exploitation, gender-based violence, and bribery and corruption	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor LGAs, police force	Number of complaints collected through the GRM Number of investigations for security-related allegations Report on the allegations disclosed to TANROADS and the World Bank within 3 days after the investigation and immediately for GBV Measures adopted by the Contractor's C-ESMP and LMP shall be implemented	Integrated in the BoQ
Affected component: women						
Impact to mitigate:						

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
32	**Risk of additional workload burden on women when men are hired for construction work**					
	Measures are mainstream in other sections					
Affected component: vulnerable groups/persons						
Impact to mitigate:						
33	**Disturbance of persons living with disabilities due to loss of access during construction work**					
	Measures are mainstream in other sections					
Affected component: HIV and AIDS situation						
Impact to mitigate						
34	**Risks of Spread of HIV/AIDS and communicable diseases**					
	Mandatory recruitment training for workers on HIV and other STDs. All workers shall receive an induction training on this issue Recruitment of service providers to implement HIV/AIDS awareness campaigns	Contractor and HIV service provider	SE and TANROADS,	Engineer, TANROADS, Contractor LGAs,	Number of trainings upon recruitment of workers. Number of HIV/AIDS awareness campaigns given by Service provider. Measures adopted by the Contractor's HIV/AIDS Awareness programme shall be implemented.	50,000,000

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Identification of a registered service provider to test workers.	Contractor and HIV service provider	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Presence of a service provider to test workers Percentage of workers tested Measures adopted by the Contractor's HIV/AIDS Awareness programme shall be implemented.	Include in the cost above
	Access to Contractor's Campsite by outsiders shall be controlled	Contractor provider	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Implementation of control at the workers camp entrance. Measures adopted by the Contractor's HIV/AIDS Awareness programme shall be implemented.	Integrated in the BoQ
	The recruited nurse at the contractor's campsite shall also be used to promote safe sex, sensitize workers on regular testing and shall provide information on the nearest health center to get tested. The nurse shall	Contractor and HIV service provider	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Compliance with these measure Number of poster and brochures distributed to workers	5,000,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	provide standard quality condoms to personnel on site				Measures adopted by the Contractor's HIV/AIDS Awareness programme and OHS risk management Plan shall be implemented.	
Affected component: child labor and forced labor						
Impact to mitigate:						
35	**Risk of child and forced labor**					
	Children under the age of 18 years shall not be hired on site as provided by Employment and Labour Relations Act, 2004 Part II Sub-part A Child Labour. This includes hiring children to do chores at the workers camp such as cleaning rooms and working in the workers kitchen	Contractor and HIV service provider	SE and TANROADS,	Engineer, Tanroads, Contractor, LGAs,	Contractor shall Comply with this Labor Law. Measures adopted in the Contractor's Labor Management Procedures shall be implemented	Integrated in the BoQ
	Introductory letter from LGAs for identification of all workers seeking for jobs from contractor's campsite. In the absence of papers, customary evidence shall be used to attest the age of the worker and ensure no	Contractor and HIV service provider	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Contractor shall Comply with this Labor Law. Measures adopted in the Contractor's Labor	Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	any worker below 18 years is allowed to be recruited.				Management Procedures shall be implemented	
	Regular audits of workers conditions based on the DIST- Labor Management Procedures (LMP) shall be undertaken to verify workers' status	Contractor and HIV service provider	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Number of audits Number of noncompliance with DIST -LMP shall be recorded and restricted. Measures adopted in the Contractor's Labor Management Procedures shall be implemented	Integrated in the project cost for the SE
	In case of suspicion or proven cases of child labor and forced labor, the Supervising engineer must ensure that TANROADS and the World Bank be formally informed	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Number of cases of child labor and forced labor Number of reports on cases of child and forced labor disclosed to the World Bank and TANROADS. Measures adopted in	Integrated in the project cost for the SE

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					the Contractor's Labor Management Procedures shall be implemented	
	Inspection and monitoring at quarry sites to ensure that no children and no forced labor are working in quarries	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs, NEMC	Number of inspection and monitoring undertaken by ESHS Team on regular basis. Measures adopted in the Contractor's Labor Management Procedures and QSBPMP shall be implemented	Integrated in the project cost for the SE
Affected component: **labor risks and conditions**						
Impacts to mitigate:						
36	**Risk of poor labor conditions due to high level of informality**					
37	**OHS risks to workers**					
	Data log of all workers and implementation of the procedures as set in the DIST -LMP to be adopted by the Contractor.	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Presence of the data log for recruited workers. Percentage of workers recruited by contractor	Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					from local community. Measures adopted in Measures adopted in the Contractor's Labor Management Procedures shall be implemented	
	Procedures to ban any form discrimination during workers recruitment	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Measures adopted in the Contractor's Labor Management Procedures and QSBPMP shall be implemented	Integrated in the BoQ
	Inspection and monitoring of workers recruitment procedures to ensure that no any workers recruited against established procures as per LMP. Follow up on the workers benefits and contribution as per labour law and LMP.	Contractor	SE and TANROADS,	Engineer, Tanroads, Contractor, LGAs,	Number of noncompliance with this measure as per LMP. Measures adopted in the Contractor's Labor Management Procedures and QSBPMP shall be	5,000,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					implemented	
	The workers GRM shall be disclosed and accessible to all workers	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Measures adopted in the Contractor's Labor Management Procedures and QSBPMP shall be implemented	Integrated in the BoQ
	Work zone safety for construction workers at all times (use of protective barriers to shield workers from traffic vehicles in towns and village centers, use of traffic cones and barrels in rural areas, use of warning lights to avoid using flaggers). OHS induction training for all workers, topics to cover during training shall cover the requirements from the section 2.2 Communication and Training from the WBG Environmental, Health, and Safety General Guidelines, 2.0 Occupational Health and Safety. Mandatory PPE equipment for all workers (adapted to the type of work), including	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Work safety zones are physically delineated at all time (cones, barrier, barrels). Number of induction training on OHS provided to workers Presence of PPE for all workers Presence of a full time Environmental, Social, Health and Safety (ESHS) Officers of the Contractor to ensure compliance with safety	15,000,000 other costs are Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	fluorescent vest for all workers. Presence on site of a full time dedicated qualified Environmental, Social, Health and Safety (ESHS) Officer of the Contractor (under the contractor payroll). Development and implementation by the contractor of a hazard identification and risk assessment that addresses all activities, routine and non-routine. This shall be done by contractor prior to beginning of work and shall cover all inherent risks associated with the construction site. Development of protocols and procedures by the contractor to detect COVID outbreaks through regular testing and isolation measures to reduce workers and community exposure to COVID and other communicable diseases. Protocols shall be compliant with the recommendations of the section 3.6 Disease Prevention from the WBG Environmental, Health, and Safety General Guidelines, 3.0 Community Health				rules. The hazard identification and risk assessment method are included in the Contractor's OHS risk Management Plan and Emergency preparedness plan are implemented accordingly. Ensure that ESHS staffs are equipped with OHS skills from OSHA. Protocols and procedures by the contractor to detect COVID outbreaks are included in the Contractor's OHS risk Management Plan	

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	and Safety. all be compliant with the recommendations of the section 3.6 Disease Prevention from the WBG Environmental, Health, and Safety General Guidelines, 3.0 Community Health and Safety. Development of protocols and procedures by the contractor to respond to work related accidents. Presence of first aid kits on site and a dedicated vehicle to drive injured workers to the nearest hospital. Availability of drinking water on work sites for all workers. Any injury, accident or near miss shall be described in a medical report by the contractor and Supervising engineer within one week of the injury. Use of millers and pavers with exhaust ventilation systems and proper maintenance of such systems to limit workers exposure to crystalline silica (millers and grinders)				Emergency preparedness plan is implemented accordingly. Protocols and procedures to respond to work related accidents are included in the Contractor's OHS risk Management Plan and implemented accordingly. Presence of first aid kits on site and a dedicated standby ambulance in case of emergency. Standby nurse to attend any emergency on site. Presence of exhaust ventilation systems in millers and pavers	

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	and asphalt fumes (pavers). Monitoring and record-keeping activities, including inspection procedures designed to verify and record the effectiveness of prevention and control of exposure to occupational hazards. Monitoring shall be compliant with the method provided in the section 2.9 Monitoring from the WBG Environmental, Health, and Safety General **Guidelines, 2.0 Occupational Health and Safety.**				Number of internal monitoring to be performed by the Contractor ESHS Staffs. Number of injuries, accidents and near misses are recorded and reported in accident record data sheet. All measures adopted in the Contractor's Labor Management Procedures and OHS risk Management Plan and implemented accordingly.	
	Contractor campsite shall comply with the recommendations from the section 2.1 General Facility Design and Operation from the WBG Environmental, Health, and	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Contractors' campsite shall comply with the requirements of the section 2.1 of the EHS	Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	Safety General Guidelines, 2.0 Occupational Health and Safety				general guidelines Measures adopted in the Contractor's Labor Management Procedures and OHS risk Management Plan and Contractors campsite management plan are implemented accordingly.	
Affected component: Gender **(Gender-Based Violence)**						
Impact to mitigate:						
38	**Risk of an increase in Gender-Based Violence**					
	A GBV action plan is in place for the DIST (the GBV action plan is a standalone document that applies to all DIST projects). It contains a GBV-SEA GRM and a workers' Code of Conduct	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Measures adopted in the DIST-GBV action plan and GRM shall be implemented	5,000,000 other costs are Integrated in the BoQ
	GBV risk assessment and GBV mapping in the project area to inform risk mitigation strategies and update a GBV referral pathway	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Measures as stipulated into GBV/SEA shall be acknowledged by the contractors.	Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					Outcome of this risk assessment to be acknowledged in the Contractor's GBV action plan Measures adopted in the GBV/SEA action plan and GRM shall be implemented.	
	Training on the DIST GBV action plan and GRM. Supervising engineer and all contractors (including sub-contractors) involved during construction shall be trained on this plan. They shall also be aware of their responsibility regarding these plans.	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Number of trainings given to the Supervising engineer and contractors' staffs on GBV. Measures adopted in the GBV/SEA action plan and GRM shall be implemented.	5,000,000 other costs are Integrated in the BoQ
	Induction training to all workers on the DIST GBV action plan and GRM, its requirements and the Code of Conduct and the use of the GBV grievance redress	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Number of induction training provided to workers. Measures adopted in	5,000,000 other costs are Integrated in

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	mechanism				the GBV/SEA action plan and GRM shall be implemented.	the BoQ
	Oversight of grievance handling and monitoring of the status and effective referral of GBV/SEA/SH complaints	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Number of complaints regarding GBV/SEA through GRM. Performance indicators are developed in the GBV action plan are observed. Measures adopted in the GBV/SEA action plan and GRM shall be implemented.	5,000,000 other costs are Integrated in the BoQ
	Separate facilities for men and women and display signs, posters and pamphlets around/along the project site that signal to workers and the community that the project site is an area where GBV/SEA is prohibited and enforce the Code of Conduct for all workers. The code of conduct to be signed by all workers	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Compliance with these measures as provided into GBV/SEA and GRM. Percentage of workers that have signed the Code of Conduct. Measures adopted in	Costs Integrated in the BoQ

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
					the GBV/SEA action plan and GRM shall be implemented.	
Affected component: cultural heritage						
Impact to mitigate:						
39	**Risk of disturbances and destruction to unknown cultural heritage sites**					
	Risks of affecting the historical and heritage site along the road and Chance finds procedure during construction activities.	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Number of discoveries of Chance Finds Objects (CFO) Report on the procedure that was followed and clearance to resume work by the inspector from the Ministry of Tourism and Cultural Heritage. Refers to ***Appendix V*** of the report.	5,000,000 other costs are Integrated in the BoQ
Mitigations to be implemented at Operation and maintenance phase						
Affected components: soils, surface water and groundwater, aquatic habitats and fish						
Impacts to mitigate:						

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
40	**Accumulation of pollutants in roadsides**					
41	**Infiltration of pollutants from roadsides in groundwater**					
42	**Impact on surface water quality from road traffic and surface runoffs**					
43	**Degradation of aquatic habitats from increase in road traffic and surface runoffs**					
	Appropriate signage to truck drivers to avoid littering. The design has foreseen to install drains with erosion checks which will reduce the silt load in streams, this mitigation is already integrated in the Project. TANROADS shall include as part of its maintenance plan, the removal of accumulated waste and silts in these drains and in culverts. Truck lay bays shall be equipped with garbage bins to collect domestic waste and waste collection at these bays shall be contracted to a service provider.	T/P	T/P	NA	Number of road signs to avoid littering Development of a maintenance plan that includes the need to remove accumulated waste and silts in drains and in culverts Number of garbage bins at truck bays and contract with a service provider for the removal of waste	Integrated in the TANROADS operation costs
Affected components: **noise level**						
Impact to mitigate:						
45	**Noise from traffic and reduction of noise due to road improvement**					
	Noise monitoring at baseline (prior to work)	Contractor	SE and	Engineer,	Implementation of a	

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	and after one year of operation along the proposed road		TANROADS,	TANROADS, Contractor, LGAs,	noise monitoring campaign by a specialized consultant	
	Should the road cause noise level to unacceptable levels at sensitive sites such as health centers and schools Noise shall be mitigated by undertaking regular vehicles of maintenance, undertake maintenance as per manufactural manuals. Undertake regular monitoring to assess the noise limits as per requirements.	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Number of complaints collected through the GRM Number of implemented measures to mitigate the effect of noise	Integrated in the TANROADS operation costs
Affected components: **air quality**						
Impact to mitigate:						
46	**Impact on air quality from road traffic and reduction of dust thanks to road improvement**					
	Reduction of the speed of vehicles in village/Mitaa centers to 50 -30km/hour as required in the Road Safety Screening and Appraisal Tool (RSSAT) in all areas used as detours and access road during construction phase	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs,	Implementation of the speed limit in all villages crossed by the road. TMP shall be put in place	Integrated in the TANROADS operation costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
Affected components: livelihood and economic activities						
Impact to mitigate or enhance:						
49	**Improved transport sector allowing for economic development**					
50	**Road accident to pedestrians along the road**					
	The risk on pedestrians uses the road project is acknowledged in the Design report where provisions for NMT shall be included in the design. Selection of their locations shall be fenced and labeled or isolated out of the traffic during construction phase	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs, Traffic Police	Number of livestock crossing implemented. Number of road signs mentioning livestock crossing Outcome of engagement activities with concerned livestock owners to be done as part of the SEP engagement activities	Integrated in the TANROADS operation and maintenance costs
Affected components: community use of the road and safety aspects						
Impacts to mitigate or enhance:						
51	**Impact on connectivity across the road and disruption of access**					
52	**Risks of road safety impacts for motorized and non-motorized road users**					
53	**Risks of Accident and Health issues for population living along the road**					
54	**Risks of limiting the Universal access to the road and walkways**					
55	**Avoiding installing guardrails alongside**	Contractor	SE and	Engineer,	Number of side roads	Integrated in

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	side roads (that are used by community members) to maintain access for vehicles and non-motorized Risks on transportation distsbunces and disruption. During the construction other road users will be disrupted to use road. If these side roads are deemed to be unsafe, the closure of their access from the trunk road shall be replaced by another access. **The major junction along the road includes Bunge, Shabiby and Meliwa**		TANROADS,	TANROADS, Contractor, LGAs, traffic police	maintained. The TMP shall be put in place	the TANROADS operation costs
	Additional engagement activities be undertaken at all mitaa that are crossed by the road to determine whether additional pedestrian crossings are necessary	Contractor	SE and TANROADS,	Engineer, TANROADS, Contractor, LGAs, traffic police	Number of consultations with affected communities as part of SEP engagement activities Minutes of meetings recorded Number of additional pedestrian crossings installed along the road	Integrated in the TANROADS operation costs

N°	Comprehensive list of all mitigations	Responsibilities of Key stakeholders			Performance indicators for monitoring	Estimated cost (TSH) per month
		Implementation	Monitoring and auditing	Corrective measures in case of non-compliance		
	The Total ESMP Implementation Costs:		**Total ESMP Costs**		**Project ESMP direct Costs of TZS 230,000,000. Other related costs are included in Project BOQ during Construction.** **Other Costs during operation phase shall be borne within Institutional annual budget**.	

8.5 Integration of E&S Aspects into Procurement Process

For effective and meaningful mainstreaming of environmental and social safeguards considerations into the road project, the following need to be taken care of:

8.5.1 Procurement and bidding process

During the bidding process, the Contractor will be expected to include a brief methodology of the implementation of the relevant environmental and social safeguards and attach a cost of implementation of these plans in his proposal bid. In addition, the contractor will have to provide relevant staff for the implementation of the safeguards including a Social Specialist supported by Community Liaison Officers and an Environment Specialist supported by HSE Officers. Lastly, the contractor should be able to prove prior experience in adequately managing safeguards issues in the road sector. The key aspects to be included in the contracts for civil works are highlighted below.

8.5.2 Bill of Quantities

The BoQs must capture all relevant safeguards aspects. These should include safeguards staffing, documentation (CESMP, etc.), waste management, HIV/AIDS, grievance redress, gender awareness, site clean-up and landscaping, monthly ESMP reporting among others. Laxity in the provision and use of personal protective equipment is a risk to the safety of workers. The BoQs should provide a sum for PPEs and supervision be done to ensure that all workers undertake works while in full PPEs.

8.5.3 Safeguards Clauses

As a best practice, the contracts for the civil works should include clauses on management of environment and social aspects. Sometimes, the clauses are weak and cannot be used to hold the contractors accountable. There is need to strengthen the clauses and to tailor them to the specific project safeguards aspects and management needs.

8.5.4 Safeguards Staffing

It is common for contractors to recruit unqualified safeguards staff or to assign safeguards duties to site foremen or clerks with no prior safeguards experience. Staffing requirements should be spelt out in the contracts. In addition, it may be useful to include the minimum requirements in the contracts for the civil works. Therefore, TANROADS through the supervising consultants must approve the contractor's Environmentalist, Health and Safety Specialist and the Sociologist.

8.5.5 Reinstatement and restoration of disturbed areas

At the end of the construction period, the Contractor must ensure restoration of all disturbed areas including materials sites through proper landscaping, backfilling and restoring topsoil, (re-) introduction of genetic species (e.g. natural re-grassing) similar to those destroyed in order to re-establish the natural local ecology.

8.6 Mandatory Environmental and Social Safeguards Management Tools

Based on the measures presented under the responsibility of the contractor in this ESMP, the Contractor shall be required to develop and implement the C-ESMP to guide implementation and supervision of environmental and social issues. These tools shall comply to national requirements and World Bank Safeguards policies. The management plans, presented below shall be reviewed and approved both by TANROADS and the Supervising engineer before mobilization on the site.

The C-ESMP will draw the basis for the Contractors, sub-contractors, sub-consultants and services providers to abide with the requirements of the implementation of the environmental, social, health and safety mitigation measures as well as the WB ESF. The C-ESMP will be updated from time to time by the Contractor on emerging issues and challenging during project implementation or upon request from TANROADS and Supervising engineer. The works Contract shall include the obligation to the Contractor to follow the WB ESF and EHS guideline during the project implementation. For effective implementation of the ESF requirements and WB EHS guideline, the ESIA and the C-ESMP will contain the detailed set of indicators to allow effective monitoring of the performance. TANROADS and PIT safeguards staff will every month undertake supervision visit to site to follow on Contractor implementation of ESF requirements and compliance together with other EHS safeguards requirements.

The ESMP shall also form part of the requirement of the tender and bid documents of the contract to be prepared and to be implemented by the Contractor. The C-ESMP shall include several management plans, which are presented here below.

Also, the contractor shall adapt its C-ESMP to reflect the requirements of the following DIST framework management plans:

- DIST -GBV action plan. The contractor shall adapt this plan and develop procedures in the C-ESMP to prevent GBV and address GBV risk in the workplace as well
- DIST -Labour Management Procedures (LMP). The contractor shall adapt this plan including the need to develop a Workers' Grievance Redress Mechanism.

Contractor shall undertake the preparation of the ESHS plans will the following brief description and essence of the C-ESMP and mandatory management plans as follows.

I. Contractor's Specific ESMP

The Contractor will prepare his own ESMP i.e., C-ESMP whose main objective will be to ensure that the mitigation and enhancement measures proposed in this ESIA report are appropriately and effectively implemented. The costs for preparation and implementation of the proposed mitigation measures are analyzed in this ESMP report and also be included into the Bill of Quantities (BoQ). The main focus of the C-ESMP will be on the impacts/risks from the following activities:

- Workers conditions and prevention of OHS risks
- Establishment of contractor's camp.
- Relocation of utilities from the RoW to receive permanent works.
- Sourcing of construction materials.

- Transportation of equipment and construction materials.
- Earthwork up to base, widening and construction of structures.
- Waste management, collection and disposal of spoil materials, demolition materials from buildings/ structures and excavated debris.
- Operation of construction equipment/machinery.
- Water abstraction.
- Quarry and borrow pits restoration.
- Spread of communicable diseases including COVID 19.
- Sexual harassment, gender-based violence, criminal behavior, crime, child labor, and safety.
- Water work and culvert replacement work
- erosion and sedimentation

The contractor shall develop a method for the removal, widening and replacement of culverts to ensure that free flow of water is not impacted, that material is not deposited in the streams and wetlands, and that turbidity of water does not increase. This includes using diversion pumps for permanent streams and silt fences and method to work in dewatered section (temporary enclosure).

The method shall be adapted for all three types of activities:

- Full replacement of Corrugated Piped Culverts (CMP) by Concrete Pipe Culvert (CPC). These are usually across seasonal streams or small drainage areas, with little environmental risks.
- Widening of existing Concrete Box Culvert (CBC) to maintain. These are usually across permanent streams that need to be protected from machinery encroachment, water pollution and spillage.
- Replacement of arched CMP to be fully replaced by CBC. These are usually across permanent streams and highly at risk of machinery encroachment, pollution and spillage due to the fact that they will be fully replaced.

Also, the ESMP shall adopt the Chance Finds Procedure during construction works, whereby archaeological findings may be encountered and potentially damaged or disturbed.

The C-ESMP shall also include Workers Code of Conduct (the model is presented in the DIST -LMP) which requires the project staff to sign and comply with ‘’Code of Ethical Conduct (CEC) attuned to Part III (Employment Standards), Section 14 (Contracts with employees) of the Tanzanian Employment and Labour Relations Act No. 6 of 2004. The CEC will set out guidelines i.e., “dos” and “don’ts” intended to support ethical behavior and decision making for all employees of the Contractor.

II. Occupational Health and Safety (OHS) Management Plan

This management plan shall be part of the C-ESM and shall be informed by requirements of the DIST -LMP and the requirements of the plan are outlined hereunder.

The main objective of the Site-Specific OHS Risk Management Plan will be to ensure that appropriate mitigation measures for addressing health and safety issues are effectively implemented by the Contractor in line with the applicable requirements mainly of the Occupational Health and Safety Act No. 5 (URT, 2003). The OHS risk management plan will outline Contractor's health and safety management system, safety in various construction activities and emergency preparedness and response.

Before starting the construction, the Contractor will prepare and submit for the approval of the site-specific Occupational Health and Safety Management Plan (OHSMP) that shall describe the measures that will be taken to achieve safe working environment, good housekeeping and occupational health and safety standards as well as security at the work place. The Contractor shall frequently provide training of occupational safety and health to the workers and information relevant to the health risk (including toolbox meeting, proper use of First Aid Kit, Personal Protective Equipment (PPE) and designated location for assembly point. During the construction period, the Contractor shall provide, equip and maintain adequate first-aid stations and stand by ambulance and first aiders to be used in case of emergency. The Contractor shall outsource qualified and registered nurses and doctors from nearby dispensaries, health centers and/or hospitals.

Further, the civil works contract shall include the requirement of the Contractor to conduct environmental, Social, Health and Safety awareness programmes around project site using audio-visual presentation, questions and answers session and provide handouts (pamphlets and reflective stickers).

The Contractor will also ensure that work camp infirmaries are equipped with relevant medical supplies such as anti-venom, anti-tetanus treatment, and anti-malaria drugs (to mention a few) to treat diseases due to unforeseeable injuries and disease outbreaks for workers and the local population in general. The Contractor has to ensure availability of PPEs and the Health and Safety inspection arrangements are in place as well as the Environmental, Social, Health and Safety (ESHS) Officer of the Contractor is deployed and comply with Law requirement.

III. Borrow Pits and Quarry Sites Operation and Reinstatement Plan

This management plan shall be part of the C-ESMP. It shall include the following requirements as presented hereunder.

The Contractor will prepare and implement Borrow Pits and Quarry Sites Operation and Reinstatement Plan (BPQSORP) to manage all impacts associated with borrow pits and quarries. The Plan will closely observe the requirements of the Environmental Code of Practice for Road Works (URT, 2009) which requires that exploitation surface of a new borrow pit or quarry must be located at least 500 meters from the following elements:

- Public or private buildings;
- Trunk or regional roads;

- Railroads;
- Water pipelines;
- Cemeteries;
- Cultural sites; and
- Classified forests.

The following aspects will be considered during selection of borrow pits and quarry areas to minimize residual environmental and social impacts as appropriate:

- Selected sites shall avoid areas close to rivers and areas such as flood plains, marshes, sites characterized by unstable ground and protected sites. However, existing borrow pits and quarries may preferably be used (instead of opening new quarries).
- Selected borrow pit sites will be based on the characteristics of the fill required to minimize disturbance to vegetation and nearby areas and also located away from significant fauna habitats.
- Selection will be done based on the strip and stockpile vegetation and topsoil for use during restoration. Likewise, selection will base on the limits of volumes or tonnages of material able to be removed, the depth of borrow pits, limits on the area that is able to be disturbed to construct and operate a borrow pit.
- The borrow pits will be suitably located away from the areas where surface water drainage patterns will not be adversely affected.
- Selection for borrow pits will avoid sensitive areas such as heritage or cultural sites, etc.
- Implementation of warning system prior to blasting (alarm) to ensure that no person is present on-site during blasting.
- Implementation of the relevant measures from the World Bank Group Environmental, Health, and Safety Guidelines for Construction Materials Extraction.

However, as presented in this ESMP, once quarry and borrow areas are pre-selected by the contractor or the Supervising engineer, a screening for impacts shall be undertaken as shown in this ESMP.

In line with the Environmental Code of Practice for Road Works (URT, 2009), the Contractor shall take all necessary measures to ensure that the borrow pit and quarry sites are restored to the state that is safe to human and animal and to the state that will allow regeneration of vegetation. Borrow pit and quarry sites must be rehabilitated by selecting one of the following options:

- Level the ground and restore the vegetation cover (i.e., tree, grasses and shrubs).
- Filling of holes (i.e., with sand, earth or stones) and restore the vegetation cover.
- Adjust the water level for local communities or livestock.
- Convert or rehabilitate the area as a leisure zone.
- Restore the site to another project.

Levelling of the sites must be done to the extent that it fits well with the surrounding land scape and is sufficient draining. In order to ensure vegetation is well restored at the site, manure must be applied or cover the entire ground surface with top soil there after the site must be cared and maintained for 1 year after the end of the exploitation.

After the widening/rehabilitation works is complete, he will ensure that the surface of the extraction surface must be free of all scraps, waste, stumps, unstable material, machinery parts, or other similar obstructions.

IV. Waste and Hazardous Material Management Plan

This management plan shall be part of the C-ESMP. It shall include the following requirements as presented hereunder.

The Contractor shall prepare this management that will clearly outline appropriate management measures for all types of wastes (solid, liquid and hazardous ones) based on the set of mitigation presented in this ESMP. The management plan will need to identify the service providers as well as the disposal sites and provide measures that will ensure all collected waste are handled in reasonable standard and disposed at the identified disposal sites. The measures will include proper handling, collection, temporal storage, transportation and final disposal at formal and authorized disposal sites. The selection of the disposal sites shall be validated by the Supervising engineer.

V. Community Communication and Engagement Plan (CCEP)

This management plan shall be part of the C-ESMP and shall be informed by the requirement of the DIST Stakeholder Engagement Plan. It shall include the following requirements as presented hereunder.

The aim of this CCEP will be to improve the Contractor's social performance by strengthening external communications.

Specific objectives of the plan will include:

- To integrate the requirements of the DIST-SEP into the management system of the contractor,
- To develop a coordinated approach to communication with external stakeholders, the Supervising engineer and TANROADS which include addressing grievances from communities regarding the work sites, workers and security personnel behavior.
- To improve two-way communication with stakeholders regarding activities and decisions that affect them (or that could potentially affect them).
- To minimize social impacts to stakeholders and social risks to the Contractor.

The CCEP will also outline the following aspects:

- Target audience.
- Strategies and tools.
- Key messages and themes.
- Employment opportunities.

- Grievance management procedures.
- HIV/AIDs awareness and prevention program.
- Gender issues and fight against GBV.

VI. Gender Based Violence Management Plan

This management plan shall be part of the C-ESMP and shall be informed by the requirement of the DIST GBV action plan. It shall include the following requirements as presented hereunder.

GBV is a serious, life-threatening protection issue primarily affecting women and children. It is well documented in this ESIA that GBV is a social issue of concern. The Contractor will abide to the DIST GBV action plan and utilize the baseline information included in this ESIA to prepare and implement appropriate measures to prevent GBV and sexual harassment. Also, the plan shall include Child Abuse Protection Plan which shall be prepared in line with Tanzanian Labor Act of 2004, the Contractor will formulate and implement a child labor policy as the basis of commitment to find practical, meaningful and culturally appropriate measures to support the elimination of child labor in workplaces.

The Gender Based Violence management plan shall be clearly communicated to all employees and workers and subcontractors in a manner which it can be understood through induction programs and policy manuals.

VII. Project Grievance Redress Mechanism (P-GRM)

This management plan shall be part of the C-ESMP and shall be informed by the requirement of the DIST; Labor Management Procedures; GBV/SEA Management Plan and Resettlement Action Plan. It shall include the following requirements as presented hereunder.

The Project grievance mechanism (GRM) for project shall be prepared by contractors to raise workers and communities' concerns as part of the contractual obligations of contractors. Under the P-GRM, project workers and communities shall raise all workplace-related concerns, including regarding unfair treatment, GBV/SEA issues; problems with payment of wages or benefits, as well as unsafe or unhealthy work situations including workplace sexual harassment. Contractors must report the status of issues raised through regular reporting.

The P-GRM will provide clarity and predictability on how workers grievances/complaints will be received, assessed, sorted, and resolved, and monitored.

VIII. Traffic Management Plan (TMP)

This management plan shall be part of the C-ESMP. It shall include the following requirements as presented hereunder.

A Traffic Management Plan (TMP) outlines traffic control measures to provide for the safe and efficient movement of vehicles, bicyclists, and pedestrians through or around temporary traffic control zones while reasonably protecting workers and equipment. Road safety awareness program shall be part of the TMP.

To ensure the objectives of TMP are met, the following activities will be undertaken by the contractor:

- Limit the interaction between project construction traffic and public traffic (with the implementation of the measures as described in this ESMP).
- Keep traffic flowing safely with the minimum of delay.
- Provide a safe working space for all equipment, personnel and materials.
- Give clear instructions to the traffic.
- Installation of traffic control equipment in prominent positions and clearly visible to the public, even in poor weather conditions or during night.
- Provision of diversion roads (within the road reserve) and installation of traffic control signs along the project road. According to the design, road diversions outside the road reserve are not anticipated. All diversions shall be confined in the road reserve. In case of additional need for road diversion (outside of the road reserve), these shall be validated by the Supervising engineer and TANROADS.
- Drivers' behaviour monitoring and traffic rules enforcement.
- Appointment of qualified Traffic Management Officer (TMO) to lead implementation of the TMP.

IX. Emergency Preparedness and Response Plan (EPRP)

This management plan shall be part of the C-ESMP. It shall include the following requirements as presented hereunder.

The main goal of this EPRP is to prevent and address minor and major spills.

It will also enable the Contractor to review his/her operations and identify all environmental hazards that are likely to occur and identify methods for control and mitigating the hazards. The Contractor must recognize that accidents and unexpected conditions do occur that would require immediate response to mitigate any detrimental effects from these accidents or conditions and planning the actions to be taken. The emergency preparedness plan outlines the mitigation measures, responsibilities, reporting mechanisms and communication procedures. The main mitigations are presented int this ESMP.

X. Contractor Campsite Management Plan

This management plan shall be part of the C-ESMP. It shall include the following requirements as presented hereunder.

This management plan shall address all environmental and social risks, source of pollution and nuisances from the worker’s camp and other work sites such as stone crushing sites, quarries and borrow areas.

This management plan shall ensure that all mitigation and preventive measures as presented in this ESMP are implemented to ensure workers and nearby community wellbeing. It shall also cover all requirements from the presented in the ESMP and the requirements of section 2.1 General Facility Design and Operation of the General EHS Guidelines from the WBG.

XI. Contractor Labor Management Procedures

This management plan shall be part of the C-ESMP and shall be informed by requirements of the DIST-LMP. It shall include the following requirements as presented hereunder.

The project contractors shall adhere to the requirements of the LMP under regular audits to be conducted by TANROADS, Supervising Engineer, and other government agencies like the Occupational Safety and Health Authority (OSHA) to ensure that the project workers are treated fairly and provided with safe and healthy working conditions. The Contractor LMP shall adopt and adapt the DIST-LMP to detail the manpower needs for the entire construction period, the local recruitment process and the approach planned to maximize local employment and to comply with national regulations.

Project workers will be provided with information and documentation that is clear and understandable regarding their terms and conditions of employment. The information and documentation will set out their rights under national labor and employment law (which will include any applicable collective agreements), including their rights related to hours of work, wages, overtime, compensation and benefits, as well as those arising from the requirements of DIST-LMP. This information and documentation will be provided at the beginning of the working relationship and when any material changes to the terms or conditions of employment occur.

XII. Erosion and Sediment Control Plan

Contractor should develop and implementation Erosion and Sediment Control Plan, which shall acknowledge all risk to local waterbodies during construction of drainage network, replacement of culverts and take all reasonable and practicable measures to minimize short and long-term soil erosion and the adverse effects of sediment transport to waterbodies. The plan should include, among others, the following tasks (1) Minimize disturbance; (2) Control site drainage; (3) Control soil erosion and increase of turbidity in waterbodies; (4) Promptly revegetate; (5) Control sediment runoff; and (6) Implement ESC Plans and monitor the site.

8.7 Environmental and social monitoring

Monitoring of the anticipated environmental and social impacts in the receiving environments is important. It helps in determining the effects of the project activities on the environments enhancing understanding of cause effect relationships between human activities and environmental changes and verifies the accuracy of prediction about the environmental impacts. It ensures compliance with regulatory measures and understanding the degree of implementation of ESMP and its effectiveness. The monitoring results are also used extensively during the environmental auditing.

The EIA and Audit regulations require the developer (TANROADS) to prepare and undertake monitoring plan and regular auditing. Monitoring is needed to check if and to what extent the impacts are mitigated, benefits enhanced and new problems addressed. Recommendations for monitoring have been included in the ESMP. The ESMP also assigns responsibilities for monitoring to mandated stakeholders, who among others, are the divisional/ward/village environmental committees and district environmental committees that participate in the long-term daily monitoring of the project road.

Among others, the monitoring issues to undertake during project implementation will include water and air quality as well as noises in regarding to the collected sample parameters undertaken prior construction phase in order to check if there any variation in term of exceeding impacts that can harm the community and the environment in general and therefore to avoid this the mitigation measures should be taken at early stage. The monitoring has set standards and parameters (for air/dust, noise, vibration) to be monitored as per national law compliance limits, international standards/WBG EHS Guidelines (including WHO parameters). Monitoring can take various forms as presented in the next sections.

8.7.1 Role of TANROADS and PIT

The overall implementation of the enhancement and mitigation measures is the primary responsibility of the TANROADS as per national requirements and WB ESSs. The supervision of the construction works and implementation of the ESMP for this road project will be carried out primarily by TANROADS's Environment and Social Department in collaboration with PIT safeguards staff. Specifically, TANROADS Environmental and Social Experts and the PIT are responsible to make sure that the aspects of the ESMF, RPF, SEP, GRM, LMP, GBV/SEA, Project-ESMP are implemented by Contractors during construction as well as to ensure that these aspects are included in the Contractor's tender documents and also are responsible for the overall monitoring of the Contractor's performance to ensure that the enhancement and mitigation measures are implemented. Also, environmental and social protection clauses for the contract and specifications will be provided to support implementation of mitigation measures.

To minimize potential environmental and social negative impacts, the project will require the support of various institutions in the implementation of this ESMP. The organization framework for the ESMP is designed to evolve as the project progresses through pre-construction, construction and operation phases. The key institutions which TANROADS will liaise with and facilitate the capacity building for monitoring aspects will include Supervising engineer, Districts authorities, traffic police, wildlife authority and district councils' officers, Sub-village/village leaders traversed by the project road, local communities and NGOs/CBOs along the road. The ESHS Officer of the contractor shall also participate to capacity building trainings. The responsible authorities for compliance audits, principally NEMC and OSHA, may wish to visit, inspect and monitor the site or specific activities at their convenient time.

TANROADS will forward its internal monitoring reports to the World Bank and NEMC during project implementation as part of their monthly, quarterly, semi-annual and annual progress reports. The WB and NEMC may conduct a compliance audit to ensure that the approved mitigation measures are implemented and that the project implementation has not led to the emergence of new impacts. TANROADS and PIT safeguards staff shall supervise the Contractor with respect to the implementation of the provisions of the ESMP.

8.7.2 Environmental Audit

According to Environmental Management Act (2004), there are three types of Environmental Audits; i.e., Initial Environmental Audit, and Control Audit (for projects which were operational before enactment of the Act), self-audit for projects that were subjected to EIA.

It is agreed that environmental audits determine the long-term effects of adopted mitigation measures. They are carried out on the project as part of the on-going maintenance programme. The audits will unveil the actual performance of mitigation measures and will allow effective measures to be included in future projects based on the legislation in force. As per operative ESIA documents in Tanzania, environmental audits would be a responsibility of the developer (TANROADS) and the National Environment Management Council (NEMC).

Based on this, TANROADS and PIT safeguards staff will, every 3 months' period from commencement of the work, undertake an environmental audit of the project to determine the long-term effects of adopted mitigation measures. This audit shall be followed by subsequent environmental annual self-audits and prepare an Audit Report for submission to NEMC. The works Contract shall include the obligation to the Contractor to follow the WB-ESF requirements and EHS guideline during the project implementation.

8.7.3 Site supervision by the Supervising engineer

The Supervising engineer will supervise the implementation of the C-ESMP, and as per performance indicators as developed in section of ESMP and ES clauses from the contractor's contract for on-going basis. This will require to mobilize a full time qualified ESHS specialists as part of the Supervising engineer staff to monitor compliance and noncompliance and develop corrective measures. All corrective measures shall be implemented by the construction contractor at its own cost.

8.7.4 Reporting of monitoring results

Monitoring results of the C-ESMP and performance indicators shall be recorded in monthly E&S Performance Monitoring Report by the Supervising engineer. The Supervising engineer, shall use the followings for monitoring:

- All performance indicators as presented in the monitoring table.
- All ESHS clauses in the construction contractor's contract.

There is set frequency for monitoring of noncompliance with the performance indicators as these shall be monitored on an ongoing basis during construction activities.

On every three months, the TANROADS- PIT and Supervising engineer ESHS specialists will undertake E&S Auditing and the results and conclusions will be included in the Performance Monitoring Report.

Senior management of the Supervising engineer should review and appraise the reports. They should be produced and disseminated by the Supervising engineer monthly during the construction as part of work progress reports. These reports will include monitoring results of the implementation of E&S measures and the details of corrective actions that were implemented by the construction contractor in the event of non-conformities.

Other monitoring reports shall be prepared by PIT for all management plans that are under its management: the LMP, the SEP and its GRM, the GBV action plan, and the Resettlement Action Plans. These safeguards tools have developed their own sets of performance indicators.

8.7.5 Reporting from the Construction contractor

The contractor shall be responsible for daily implementation and internal monitoring of all activities regarding the road project. NEMC will be responsible for overseeing that all Environmental construction activities are conducted in a manner that adheres to regulations outlined in Environmental Impact Assessment and Audit Regulations (2005).

The contractor ESHS Officers will be the focal point for all ESHS related topics including developing the C-ESMP and other related subplans and updating it on a regular basis.

The Construction contractor shall also be required to produced ES reports which shall cover the following topics:

- Implementation of the C-ESMP and ESHS contractual obligations.
- Environmental incidents and near misses: environmental incidents and high potential near misses and how they have been addressed.
- Major work: those undertaken and completed, progress against project schedule and E&S measures.
- Labor staffing (labor data log): number of workers, new hires, titles, number of workers from local communities and evaluation of the targets to hire members of the communities, number of expat workers.
- E&S inspections and audits: including those of authorities, labor condition inspectors and the Supervising engineer audits.
- Training on E&S issues.
- External stakeholder engagement and grievances related to the Contractor and Subcontractor Work, participation to meetings with the Supervising engineer and stakeholders.
- Details on any security risks.
- Worker's grievances: type of grievance, actions taken, dates and resolutions.
- Major E&S changes to the C-ESMP or action management plans.

- Self-assessment of performance indicators and deficiency such as E&S noncompliance and corrective actions implemented.

8.7.6 Monitoring parameters

Performance indicators will be monitored on a continuous basis during the project lifespan. In addition to the performance indicators that are presented in the table below, TANROADS has identified several parameters that will be supervised on a set basis during TANROADS site visits. The following table presents these parameters to monitor and the set frequencies. The basic monitoring parameters/benchmarks is based on national law compliance limits and international standards/WBG EHS Guidelines.

8.7.7 ESMP Consolidated Monitoring parameters and Responsibilities

The following table present impacts, parameters, monitoring, sampled areas, methods, responsibilities and costs.

Table 8.3:Environmental and Social Monitoring Plan

N°	Impact Items	Parameter	Monitoring/ Period Frequency	Sampling Area	Measurement Units	Method	Target Level/Standard (Indicator)	Responsibility for Monitoring	Annual Costs Estimates (Tsh)
1	Relocation and resettlement Compensation	Rate of Compensation for land and properties	Before and during construction	Project area	Compensations effected	Resettlement Action Plan (RAP).	All PAPs are compensated fairly according to the RAP which	TANROADS, PIT, GRM-GRC	10,000,000
2	Relocation of public utilities	Number of utilities relocated	Once before the construction starts	Project area	Number of utilities relocated	Physical	All affected utilities are relocated	Utility Authorities Contractor, TANROADS, PIT	5,000,000
3	Soil erosion	Soil erosion along the road	Baseline before construction starts Rainy days during construction	Project road Detour routes, Quarry site and borrow pits.	Level of erosions	Site inspection	No soil erosion is observed on site and at culvert location	Contractor, TANROADS, PIT	3,000,000

4	Noise pollution from machinery, plants and equipment's	Ambient noise level	Once at baseline to determine the current noise level (before beginning of work) Once	Near settlements (villages), Around the campsite	dBA	Noise Level Meter	See standards in the separate table. Noise level during day time (below 50dBA) at sensitive	Contractor, TANROADS, PIT	6,000,000
N°	**Impact Items**	**Parameter**	**Monitoring/ Period Frequency**	**Sampling Area**	**Measurement Units**	**Method**	**Target Level/Standard (Indicator)**	**Responsibility for Monitoring**	**Annual Costs Estimates (Tsh)**
5	Air pollution from machinery, plants and equipment's (including asphalt concrete	Various parameters, see table above	Once at baseline to determine the current air pollution level (before beginning of work) Once	Near settlements (villages). At quarries and borrow areas and stone crushing sites	Various unit	Micro Dust Pro and other air quality sampling device	See standards in the separate table	Contractor, TANROADS, PIT	4,000,000
6	Dust Suppression from machinery, plants and	Water sprinkling	Three time daily during dry season and windy days in	Project site at village centers and towns Quarry sites	Frequency of water sprinkling	Inquiries and observation	Minimum dust emission	Contractor, TANROADS, PIT	10,000,000
7	Vibration	Vibration PEAK acceleration of 0.015ms2	Vibration baseline levels before construction and monthly during construction	Project site at village centers and towns, Quarry sites	No per time	Records	Reduced cased of complaints Less than PEAK acceleration of 0.015ms2	Contractor TANROADS, PIT	2000,000

8	Spread of HIV/AIDS	Number of people attending awareness straining	Quarterly	Project area	Number of voluntary counseling and testing	HIV test	Reduced cases of new infections	Contractor, TANROADS, PIT	30,000,000
9	Safety and health risks	Number and type of safety equipment such as mask, helmet gloves and ear plugs. Health and sanitation facilities in camps.	Daily inspection to ensure use of PPE when on site.	Project site	Number of safety measure provided	Actual injuries and illness statistics	All safety gears are provided	Contractor TANROADS, PIT OSHA	10,000,000
N°	**Impact Items**	**Parameter**	**Monitoring/ Period Frequency**	**Sampling Area**	**Measurement Units**	**Method**	**Target Level/Standard (Indicator)**	**Responsibility for Monitoring**	**Annual Costs Estimates (Tsh)**
10	Accidents to road users	Injuries	Daily	Project area	Number of cases	Physical observation	No accidents	Contractor TANROADS, PIT OSHA Traffic police	10,000,000
11	Water Quality in affected streams during culvert replacement and in wells close to the	Turbidity Total suspended Solids Oil and grease	Baseline before construction starts Once per month during rainy season Twice a week during dry	All rivers/streams along the project road. Also, at a sample of local wells, especially	To be determined	In site measurements And laboratory tests	No significant increase from baseline	Contractor TANROADS, PIT	5,000,000

	workers' camp		season	near camps.					
12	Waste management	Generated amount	Once a week	Project area	Weight (Kg)	Inspection	Cleared surrounding environment	Contractor TANROADS, PIT Supervising engineer	10,000,000
13	Loss of definite materials and land degradation from earth works	Area degraded	Twice a month	Project area	Area of land degraded;	Physical Inspection	degraded land sites restored	Contractor TANROADS, PIT Supervising engineer	3,000,000
14	Loss of vegetation cover	Surface of vegetation clearance	Quarterly during construction	All forests along the road and greenfield	Type and number of living organisms	Counting and Observation	N/A	Contractor TANROADS, PIT	3,000,000
15	Loss of Biodiversity	Number of road kills	Monthly during construction	All road and off-site facilities	Number of road kills	Inspection	Areas with of biodiversity affected	Contractor TANROADS, PIT Forests Officer	3,000,000
N°	**Impact Items**	**Parameter**	**Monitoring/Period Frequency**	**Sampling Area**	**Measurement Units**	**Method**	**Target Level/Standard (Indicator)**	**Responsibility for Monitoring**	**Annual Costs Estimates (Tsh)**
17	Impacts on Cultural/Religion	Awareness about and efforts to	On daily basis during earthworks	Along the construction corridor,				Contractor; TANROADS / PIT/ District	3,000,000

	Values	follow Chance Finds Procedure asper Appendix V.		Query site and the borrow areas				council (Antiquities Department)	
18	Community Complaints and Grievances	Raised complaints	Monthly	Project area	Number of registered complaints	GRM	Prompt resolution of complaints	Contractor; PIT, TANROADS / District council	5,000,000
19	Sexual exploitation and abuse	See GBV action plan	Monthly	Project area	Number of registered complaints	GRM	See GBV action plan	Contractor TANROADS, PIT GBV service providers	3,000,000
20	Violation of children rights	Raised complaints	Monthly	Project area	Number of registered complaints	GRM	Prompt resolution of complaints	Contractor TANROADS, PIT District council	3,000,000
21	Local content	Employment opportunity	Percentage of local Construction workers	Project site	Number of local people employed in the project	Records, inquiries and observation	To be determined with ward and village authorities	Contractor District council TANROADS, PIT	5,000,000
22	Increased in livestock kills from Road Accidents during construction	Frequencies of animal crossing	Daily inspection to ensure no road kills.	Accident sensitive areas	Number of animal kills	Physical observation and count of accident records	Zero accident occurrence	Contractor TANROADS, PIT LGAs and Wildlife Authority	5,000,000

23	Risks associated with security personnel to local community	Events of complaints	Monthly	Construction site	Number of workers/community complaint	Registered records of complaint	Zero workers/community complaints	Contractor; PIT TANROADS / LGAs and Police forces	3,000,000
N°	**Impact Items**	**Parameter**	**Monitoring/Period Frequency**	**Sampling Area**	**Measurement Units**	**Method**	**Target Level/Standard (Indicator)**	**Responsibility for Monitoring**	**Annual Costs Estimates (Tsh)**
24	Loss of definite materials and land degradation at borrow pit and quarry rehabilitation	Area degraded around borrow pits and quarry site	Twice a month	Project area	Area of land degraded	Physical Inspection	degraded land sites restored	TANROADS, PIT Supervision Consultant	3,000,000
25	Impacts associated with construction of campsite and its facilities (equipment's, plants and materials storage yards)	Area degraded around campsite establishment	Twice a month	Campsite areas	Area of land degraded	Physical Inspection	degraded land sites restored	TANROADS, PIT Supervision Consultant TANROADS	5,000,000

26	Impacts on disposal of spoils materials along the road.	Area degraded around the road, borrow pits	Twice a month	All construction sites	Area of land degraded;	Physical Inspection	Spoiled materials reinstated or reuse for vegetation	TANROADS, PIT Supervision Consultant TANROADS	3,000,000
	Grand Total								**167,000,000**

The Total Costs related to ESMP Implementation and monitoring

The total direct annual costs of implementing the ESMP is estimated to TZS 230,000,000 for the entire project, whereby the costs for ESMP monitoring shall be TZS 167,000,000. Most of these mitigation measures needs presence of ESHS specialists on site for best management practices by the construction contractor. The costs related to operational and maintenance phase shall be borne by the responsible institutions.

9.0 RESOURCE EVALUATION OR COST BENEFIT ANALYSIS

9.1 Introduction

This economic analysis to test the viability for the Proposed Improvement of Dodoma Central Business District (CBD) Roads, Iringa and Arusha Approach roads was conducted during the time of this consultancy. Normally economic analysis for road construction is done using the HDM-4 model, which is an analytical framework based on the concept of pavement life cycle analysis. The model analyses the project road with different investment and maintenance options, taking into account the associated costs and benefits projected annually over the analysis period, to determine the economic and engineering viability of the project.

9.2 Factors causing road deterioration

Once a road is constructed and opened to traffic, its pavement deteriorates as a consequence of several factors, most notably:

- Traffic loading
- Environmental weathering
- Effect of inadequate drainage systems

The rate of pavement deterioration is directly affected by the standards of maintenance applied to repair defects on the pavement surface such as cracking, raveling, potholes, etc., or to preserve the structural integrity of the pavement (for example, surface treatments, overlays, etc.), thereby permitting the road to carry traffic following its design function. The overall long-term condition of road pavements directly depends on the maintenance or improvement standards applied to the road. When a maintenance standard is defined, it imposes a limit to the level of deterioration that pavement is permitted to attain. Consequently, in addition to the capital costs of road construction, the total costs that are incurred by road agencies shall depend on the standards of maintenance and improvement applied to road networks.

The impacts of the road condition, as well the road design standards, on-road users are measured in terms of road user costs, and other social and environmental effects.
The road user costs comprise:

- ***Vehicle operation costs*** (fuel, tires, oil, spare parts consumption; vehicle depreciation and utilization, etc.)
- ***Cost of travel time –*** for both passengers and cargo, and
- ***Cost to the economy of road accidents*** (that is, loss of life, injury to road users, damage to vehicles and roadside objects).

The social and environmental effects comprise vehicle emissions, energy consumption, traffic noise, and other welfare benefits to the population served by the roads. Although the social and environmental effects are often difficult to quantify in monetary terms, they can be incorporated within the HDM-4 economic analyses if quantified exogenously.

Road User Costs in HDM-4 are calculated by predicting physical quantities of resource consumption and then multiplying these quantities by the corresponding user-specified unit

costs. It is necessary to ensure that the vehicle resource quantities predicted are in keeping with the range of values observed in the area of application.

Economic benefits from road investments are then determined by comparing the total cost streams for various road works and construction alternatives against a base case (without a project or do minimum) alternative, usually representing the minimum standard of routine maintenance. HDM-4 is designed to make comparative cost estimates and economic analyses of different investment options. It estimates the costs for a large number of alternatives year by year for a user-defined analysis period. All future costs are discounted to the specified base year. To make these comparisons, detailed specifications of investment programs, design standards, and maintenance alternatives are needed, together with unit costs, projected traffic volumes, and environmental conditions.

9.3 Economic Parameters

All costs used in that are used in the HDM-4 analysis need to be expressed in economic terms, excluding taxes, to exclude transfer payments within the economy and correct for distortions between international and domestic prices caused by applications of duties and taxes on traded items.

9.3.1 Financial and Economic Costs

All costs used in the analysis need to be expressed in economic terms, excluding taxes from financial costs, excluding transfer payments within the economy, and correcting for distortions between international and domestic prices caused by applications of duties and taxes on traded items. TANOADS recommends a Standard Conversion Factor (SCF) of 0.82 for adjusting financial prices on most common costs to economic costs.

9.3.2 Shadow Pricing

In performing economic analyses, it is requisite to use *economic costs* as opposed to *financial* costs. Prices of commodities and services in the market normally include taxes and duties which are transfer payments. Market prices, therefore, do not represent the actual resource cost. Financial costs need to be converted to economic costs by eliminating taxes and other transfer costs. This is what shadow pricing entails. For imported goods, the '*Cost Insurance and Freight* (CIF) '*Free on Board'* (FOB) prices are used while for exported goods, '*Free On Board* (FOB) prices are used. Market prices for foreign exchange and labor also need to be shadow priced to eliminate market distortions.

9.3.2.1 Foreign Exchange

Foreign exchange is normally subjected to market distortions due to the imposition of trade barriers such as import quotas, tax barriers, and taxes on imports. In the evaluation, the foreign exchange needs to be treated using a *shadow exchange rate* which eliminates the above-mentioned market distortions from the *official exchange rate*. Foreign exchange has been liberalized in Tanzania, and the Tanzania shilling is, for practical purposes, a currency fully convertible at current market rates, the conversion factor applied to all expenditures in foreign currency is therefore equal to one.

9.3.2.2 Labour

Distortion in the labor market exists when the market wage payable for labor by the public institutions and large projects are higher than the marginal value product of labor elsewhere. In such situations, a shadow wage rate has to be calculated for unskilled and skilled labor. Tanzania has widespread unemployment and underemployment in the labor market. Market wages for skilled and unskilled labor can therefore be considered as shadow wages.

9.3.3 Conversion of financial to economic costs

An alternative method for shadow pricing is establishing a factor to convert financial to economic costs including construction and maintenance costs by using a Standard Conversion Factor (SCF) which is a ratio of economic cost to financial cost. A conversion factor recommended by the TANROADS Economic Appraisal Manual is 0.83. The Consultant has used this SCF in this study.

10.0 DEMOBILIZATION PLAN

10.1 Implementation of Demobilization Plan

The demobilization and site reclamation process are one of the required project management activities during the project completion or closure of the projects and should be done in accordance with the approved Contractor's Environmental and Social Management Plan (C-ESMP).

The demobilization plan will involve site rehabilitation and restoration of disturbed areas due to construction activities. It is the responsibility of the Contractor to undertake rehabilitation and restoration works to ensure that the environmental value of the project site is maintained for the present and future generations. The purpose of site rehabilitation is to ensure that all disturbed areas caused by construction activities are restored, leaving a stable environment that is conducive to the establishment of landscapes characteristic to the area.

The demobilization activities will involve removal of all mobilized items and cleaning up of the construction sites. It will include the removal of all temporary ramps, access ways, road signs, temporary fencing, construction debris including crushed stone aggregates, pieces of wood, construction stakes, and other construction-related refuse, and temporary facilities or works. The restoration of surfaces to an equal or better than existing condition shall also be included as part of demobilization. Site reclamation includes reclamation of areas disturbed during construction, other than access and staging areas, to pre-project conditions or better.

In order to ensure that all demobilization and site reclamation works are done in a comprehensive way right from the beginning, it is important to have a demobilization checklist which shows all items that need to be completed during implementation of demobilization plan. An example of Environmental and Social Demobilization Checklist is provided in Error! Reference source not found.**6**, which groups the different items that need to be completed and inspected. The checklist covers the following issues and areas to be considered during implementation of demonization plan:

- Workers Welfare Management
- Camp Sites and Office Facilities; Solid Waste Management; Soil Erosion and
- Sedimentation Control; Groundwater and Dewatering Contol.
- Workshops/Garages,Vehicle Washing and Refuleing Areas.
- Fuel and Chemical Storage Area
- Sanitary and Wastewater Disposal Facilities.
- Landscape Management and Run-off Control
- Borrow pits/Quarry Sites Rehabilitation.

The demobilization checklist will be used by Supervision Consultant's Environmental Expert. For each inspection item, the form has a column for the work completion status (Yes, No or Not Applicable), observation comments made by the inspector for non-compliance works that need to be rectified by the Contractor and the target completion date for completing the non-conformant works. The Environmental Inspector will be taking some

photographs during the site inspection for recording purpose. The photographs will be attached to the Environmental Demobilization Checklist and submitted to the Resident Engineer for action.

10.2 Demobilization of Employees

Three months before completion of the project, the Contractor through Human Resource Officer (HRO) will make sure NSSF contributions for all construction workers have been paid to the NSSF. This will involve posting of the names of all employees on the notice board indicating their Names, NSSF numbers and Monthly NSSF contributions. This is to ensure that that the monthly NSSF deductions have been paid by the Contractor and allow rectification for any identified shortcomings before retrenchment of employees.

10.3 Exit Medical Examination for Employees

The Contractor will carry out an exit medical examination for all employees before retrenchment. This is the requirements of Sub-section 24(2) of the Occupational Health and Safety Act No. 5 of 2003. The legislation requires the Contractor shall carry out an exit medical examination through a qualified occupational health physician. According to Su-section 24(3), the Contractor shall be responsible for the prescribed fee and all other medical expenses.

10.4 Restoration of Utilities, Drainage Systems and Landscape

During demobilization phase all work areas, offices, workshops /garages and other temporary installations will be cleaned up and the site will be restored. These includes removal of temporary buildings, surplus materials, pieces of wood, pieces of bricks or any other material that is not in the area before constriction works.

All drainage systems will be desilted to allow storm water flow and damaged areas will be repaired to make them compatible with urban land use and maintain the aesthetic value of the urban environment. All permanent installations such as traffic lights, street lights, electricity power supply, water supply, and sewerage systems will be restored / repaired to their initial state.

The compacted soils around buildings will be scarified to at least 15cm deep to loosen it and facilitate vegetation growth. Damaged trees will be chopped / lopped and crosscut and removed from the construction sites. The site will be cleared of equipment, solid wastes, debris and overburden resulting from construction works.

10.5 Restoration of Workshops / Garages and Materials Storage Areas

The workshop and other materials storage areas will be cleaned to remove petroleum products like oils and grease. The petroleum products should be handled in accordance with the provisions given in the Standard Specification for Road Works (2000).

All asphalts, cements, stockpiled gravels and any other surplus materials will be removed from the Materials storage yard. The useable materials should be taken away and stored in a safe place far from the abandoned site. The spilled materials must be removed and the site must be properly cleaned and restored to its original state. If possible, the site must be prepared and planted with vegetation. The stockpiled soils along within the project site will be spread or disposed of into permitted area by the Resident Engineer.

10.6 Restoration of Solid Wastes and Spoil Materials Dumping Sites

All unwanted soil/spoil materials will be removed from temporary dumping sites and transported to permitted disposal site. The remaining useful soil materials will be mixed with surrounding topsoil, properly levelled and graded to allow vegetation growth.

The solid waste dump site will be cleared, levelled and returned to a regular form. All non-toxic wastes in the dump site will be thoroughly covered with topsoil. The Contractor will ensure that no wastes are visible and no surface water drains into the site.

The eliminated dry materials should form a stable slope and must be in harmony with the surrounding landscape. The wastes will be covered with 1 m of topsoil. The soils will be compacted thoroughly, the slope flattened and spread a layer of additional cover material and cover with topsoil to allow growth of natural vegetation.

10.7 Rehabilitation of Borrow Pits/Quarry Pits

Borrow pits and Quarry Pits areas that have been used to extract road building materials such as gravels/soils in the case of borrow pits and aggregates in the case of quarry pits. They can vary considerably in size, depending on the quantity of material taken and the reserve body of remaining material. The variable size, shape and nature of borrow pits/quarry pits preclude very specific recommendations, however the following general conditions apply.

10.7.1 Rehabilitation of Borrow Pits

At the completion of the project all borrow pits will be made stable and safe. This will require the sides of the pit to be reshaped into gentle safe slope ($\leq$ 30%). All disturbed areas associated with borrow pits will be covered with surrounding topsoil, to allow growth of grass, as part of the restoration plan.

Some of the borrow pits with water, especially in drought-stricken areas, may be left as livestock water drinking points, if requested by the local community. However, the Contractor will be required to submit a written letter from the local community leaders. The Contractor will discourage the use of borrow pits that are close to the road as livestock drinking points.

10.7.2 Rehabilitation of Quarry Pits

The rehabilitation requirements of quarry pits will be considered before commencement of development activities and will be fully integrated into the road construction programme. It is important to note that successful rehabilitation begins at the commencement of development and should be phased throughout the working life of the quarry.

The type of mineral and method of working will affect the options for rehabilitation and after use of a site. Therefore, the depth of working, the volume of mineral waste, the potential to

import solid and other infill materials, the topography of the site and nature of the surrounding area will be considered.

The quarry face is often the most visible part of a quarry because of the colour of rocks and unnatural landform. The quarry face will be treated to make it blend into the landscape. This will include:

- Developing a more natural landform that is stable.
- Encouraging vegetation to develop, to heal the visual scars.

If there is a sufficient land area at the top of the quarry face, the face can be reshaped by blasting techniques. This method of blasting will be different from the normal quarry blasting, which is designed to produce a clean, near vertical rock face. Instead it will aim to shatter the rock, leaving the upper parts of the face at a more stable angle and a screen at the bottom. In the case of soft stone quarries, it may be more appropriate to use mechanical plant to break up and shatter the rock face, rather than blasting.

10.8 Monitoring of Demobilization Plan

Monitoring will be carried out by the Supervision Consultant to ensure the activities specified in contract are being adhered to by the Contractor. During monitoring the Supervision Consultant's Environmental, Health and Safety and Social Experts will undertake assessment of the site conditions and recommend the restoration / rehabilitation requirements for implementation by the Contractor. Emphasis will be placed on the continuity between site characteristics and the adjacent landscapes.

11 SUMMARY, CONCLUSION AND RECOMMENDATIONS

11.1 Summary

The purpose of this project is to undertake upgrading of some road sections in the Dodoma City. The need and justification from the project have been prompted by the current problems of traffic congestion in the city. It is therefore, expected that the upgrading of these roads into bitumen standard will reduce travel time, improve productivity and stimulate economic growth of the local residents. From environmental point of view the upgrading of the road sections will lead into improved air quality due to reduced dust emission and reduced exhaust emission due to reduced traffic congestion, which ultimately means less fuel consumption and vehicle operation and maintenance costs.

The project has been found to be compatible and complies with relevant national policies, legislations, guidelines, standards, as well as relevant international conventions/agreements /treaties. In addition, the institutional framework for environmental management is well established from local government levels to the national level. The Contractor will be required to comply with regulatory requirements and obtain relevant permits from relevant institutions and regulatory authorities.

The baseline indicates the road sections traverse through densely populated and built-up urban areas with high concentration of residential, commercial and institutional buildings. The widening of the road sections in some areas is likely to affect the adjacent building structures, hence leading into high compensation costs. In order to avoid this problem, the design has considered re-alignment of the road sections and confining the construction works within the ROW of 20 m as much as possible. However, as you move outside the CBD through the link roads the land use becomes dominated by cultivation with few settlements. Most of the areas are highly degraded areas with patches of bare areas, which are prone to soil erosion.

The presence of public service infrastructure/utilities such as electricity power lines (overhead or underground) telephone cables (overhead or underground), water supply pipelines, and sewer pipelines is likely to delay commencement of construction works. These public service infrastructure/utilities either cross of run parallel to the road sections, hence likely to be affected during construction. To avoid this problem immediate relocation and restoration of the likely affected infrastructure/utilities will be done before commencement of the construction works. In addition, the road design has taken into consideration the provision of service ducts at various locations to allow crossing of the road sections, to allow future maintenance of the crossing infrastructure/ utilities without causing any damage to the road pavement.

The results of the assessment indicate most of the negative impacts will occur during construction phase and are expected to have significance and most of the positive effects/impacts will occur during operation phase and are expected to have high significance. In the long term the beneficial (positive) impacts will outweigh adverse (negative) impacts as

evidenced by benefit cost analysis. Moreover, most of the identified negative impacts are can be mitigated through design and good engineering practice.

Finally, the majority of stakeholders do support the project because they know it will reduce traffic congestion and stimulate economic growth in the city. However, some of the stakeholder have expressed their concerns regarding dust emission, relocation of infrastructure/utilities, compensation, employment, land restoration, solid wastes generation, increased prevalence of HIV/AIDS, and increased road traffic accidents. These concerns have been taken into consideration and their mitigation measures have been incorporated into the ESMP, which ultimately will be reflected in the Bill of Quantities (BOQ) during preparation of the Bidding Documents.

11.2 Conclusion

In general, the project has been found to have several environmental, social, health and safety, and economic benefits. The environmental benefits will be obtained through improved air quality for urban population because the widening and upgrading of the road sections into bitumen standard will result into reduced traffic congestion, hence reduced dust and exhaust emissions along the road sections.

Socio-economic benefits include creation of temporary employment and income generation opportunity for local people during construction. The long-term benefits include reduced road maintenance costs due to increased durability; reduced vehicle operation and maintenance costs due to improved road conditions; increased productivity due to faster movement of passengers and goods along the road sections; improved access to external markets for agricultural produce from villages traversed by the road sections; and improved access to social services for the local communities living in areas traversed by the road sections.

The employment opportunities during construction can be enhanced by emphasising on labour-intensive construction methods such as excavation of trenches for roadside storm water drainages and culverts. The labour-intensive construction methods help poor families to supplement their incomes, and at the same time gives them some skills for future employment.

Finally, the project is expected to result into reduced risk of traffic accidents due to widening of the road sections and installation of traffic control signs. The most beneficiaries will be the vulnerable groups such as school children, disabled, sick persons, and the elderly.

Despite the mentioned benefits the project is likely to create some negative impacts. These include loss of land and other properties; disruption of public transportation; increased risk of traffic accidents during construction; increased prevalence of HIV/AIDS and STIs due to interaction between local residents and construction workers. The project is also likely to result into emergence of GBV/SEA and SH due to influx of people into the project site as job seekers and other income generation opportunities. However, the identified impacts can be minimized through formulation of appropriate mitigation measures.

11.3 Recommendations

The project has been found to have long-term environmental and socio-economic benefits than its negative impacts, which are mainly short-term during construction phase. In addition, the cost/benefit analysis and economic analysis have already found the project to be highly beneficial and economically viable, respectively. It is therefore, recommended that the project should be implemented immediately to avoid increased construction costs due to increasing inflation rate.

In order to ensure the successful implementation and sustainability of the project, the Consultant provides following recommendations:

(a) TANROADS should take into account the climate change factor during the design and construction phase to ensure the long-term durability of the road pavement and associated bridge structures.

(b) TANROADS should collaborate with Dodoma City Council to relocate small business operators before commencement of the construction works.

(c) TANROADS in collaboration with Dodoma City Council should promote awareness and education campaigns among the local residents to avoid discharge of raw sewage wastes water into the road side storm water drainages.

(d) TANROADS should promote awareness and education campaign among the local communities of the villages located along the road sections on the importance of protecting the road furniture against vandalism. The emphasis should be on the understanding the relationship between removing the road signs and increased risk of road traffic accidents.

(e) TANROADS should make consultation with Tanzania Railways Corporation (TRC) to identify railway crossing areas and provide safe railway crossings.

APPENDICES

Appendix 1: Minutes of Public Meetings Conducted

MUHTASARI WA KIKAO CHA WANANCHI NA WATAALAM WA TANROADS KILICHOFANYIKA TAREHE 17/12/2024 OFISI YA KATA YA MADUKANI.

AGENDA

1: Kufungua Kikao
2: Utambulisho wa wageni.
3: Utambulisho wa Mradi
4: Kubainisha faida za mradi
5: Kupokea maoni na Ushauri
6: Kufunga Mkutano.

AGENDA NO 1: Kufungua Kikao

Kikao kilifunguliwa mnamo saa 11:10 asubuhi na mwenyekiti wa Kikao kwa Kuwashukuru wananchi kwa mahudhurio yao mazuri.

AGENDA NO 2: Utambulisho wa Wageni

Afisa Mtendaji wa Kata aliwaeleza wananchi kuwa ni vema wananchi wawajue wageni waliokuja, hivyo wageni wote walisimama na kuanza kujitambulisha kila mmoja kwa majina na Vyeo vyao.

AGENDA NO 3: Utambulisho wa mradi

Mtaalamu kutoka TANROADS alisimama na kuwaeleza wananchi kuwa lengo la kuja hapa ni kwa ajili ya kuutambulisha mradi ambao ni Ujenzi wa barabara kuu zote ambazo ni barabara ya Iringa, Arusha, Dar-es-salaam na Singinda, hivyo Kata yetu kuna sehemu ambapo mradi wa Upanuzi wa barabara utapitia ndio maana tumeamua kuja kuwata arifu au kuutambulisha mujue.

MUHTASARI WA KIKAO CHA KUTAMBULISHA MRADI WA KUFUNGUA BARABARA TAREHE 16/12/24

AGENDA

KUFUNGUA KIKAO

KUTAMBULISHO

- KUTAMBULISHA MRADI
- ATHARI NA FAIDA ZA MRADI
- MAONI YA MRADI
- KUFUNGA KIKAO

KUFUNGUA KIKAO

Mkiti wa kikao alifungua kikao mnamo saa 11:03 Asubuhi kwa kuwakaribisha wageni waalikwa toka dar-es-salaam na wenyeji

UTAMBULISHO

Wenyeji wote walijitambulisha kwa wageni na wageni kutoka tanroad dar-es-salaam na kutoka makao makuu dodoma.

- KUTAMBULISHA MRADI

Tuna hitaji kufungua barabara ya dodoma dar-es-salaam kutakuwa na njia sita, Barabara ya Arusha-dodoma pamoja na Iringa dodoma njia zote tunataka iwe funguwe hivyo tunaomba ridhaa yenu ili tufanye huo Mradi

ATHARI NA FAIDA ZA MRADI

Mradi huu tunafadhiliwa na bank kuu ya dunia sasa Mradi wowote unakuwa na athari na kadhika kila athari lazima iwe na ufumbuzi

- Kama tukiweka barabara ya akiba lazima iwe na uumbi sasa inabidi tunajitahidi kuwagijia barabara mara mbili tatu mara tatu

- Kunakuwa na Mitikisiko
Tunapunguza kwa kwalipa nyumba zinazo bomoka.

- Mwingiliano ya watu.
Jamii inayo ishi pale tunawaletea wageni wengine ~~wa~~ wa kimataifa yaani Mwingiliano wa tamaduni

Faida za Mradi.

- Itapunguza foleni, kwa sababu tutakuwa na barabara nne hivyo tutapunguza foleni
- Kutoa ajira, ~~Ku~~tatoa ajira zote zawa ila tuwe tumesoma hata kama hatuja soma kuna ajira ambazo zitawaleta am bao hawajasoma napo mshika bendera.
- Kukodisha nyumba za kulala.
Tunatakiwa kutengeneza nyumba kwani kuna watu watakao kaa kwenye maeneo yetu ~~ili~~ kwa ajiri ya kupanga sasa mnatakiwa ziboleshwe ziwe nzuri

MUHTASARI WA MKUTANO WA WANANCHI KATA YA KIKUYU KUSINI 16/12/2024

AGENDA ZA MKUTANO

1. KUFUNGUA MKUTANO
2. UTAMBULISHO
3. KUBAINI/ KUTAMBULISHA MRADI
4. KUBAINISHA ATHARI ZA KIJAMII NA KIMAZINGIRA
5. KUBAINISHA FAIDA ZA MRADI
6. KUPOKEA MAONI NA USHAURI
7. KUFUNGA.

AGENDA NA 01: KUFUNGUA MKUTANO

M/kiti aliwashukuru wajumbe na wananchi kwa kufika na kuwataka kuonyesha ushirikiano muda wote wa mkutano alifungua mnamo saa 04:55 asubuhi

AGENDA NA 02: UTAMBULISHO

Wawezeshaji walijitambulisha kwa majina yao na nafasi zao.

AFISA MTENDAJI
KATA YA K/KUSINI
S.L.P 1249
DODOMA

AGENDA NA 03: KUTAMBULISHA MRADI

Mwezeshaji kutoka TANROADS alianza kwa kusema wizara ya ujenzi kwa kushirikiana na TANROADS imeona kuna umuhimu wa kuboresha Barabara zetu ndani ya mkoa wa Dodoma kutokana na ukuaji wa Jiji wa Dodoma na mkoa wetu ndiyo makao makuu hivyo tumekuja kutambulisha mradi wa kupanua Barabara. Njia ya ringa road zitaongezwa njia nne (4) njia ya Babati njia nne na Morogoro road njia sita (6), Tumekuja kwenu ili kujadiliana kwa pamoja kwa kushirikiana na wataalamu

AGENDA NA 04 KUBAINISHA ATHARI ZA KIJAMII NA MAZINGIRA.

Mwezeshaji alianza kwa kusema katika miradi athari kubwa mojawapo ni kupoteza makazi.

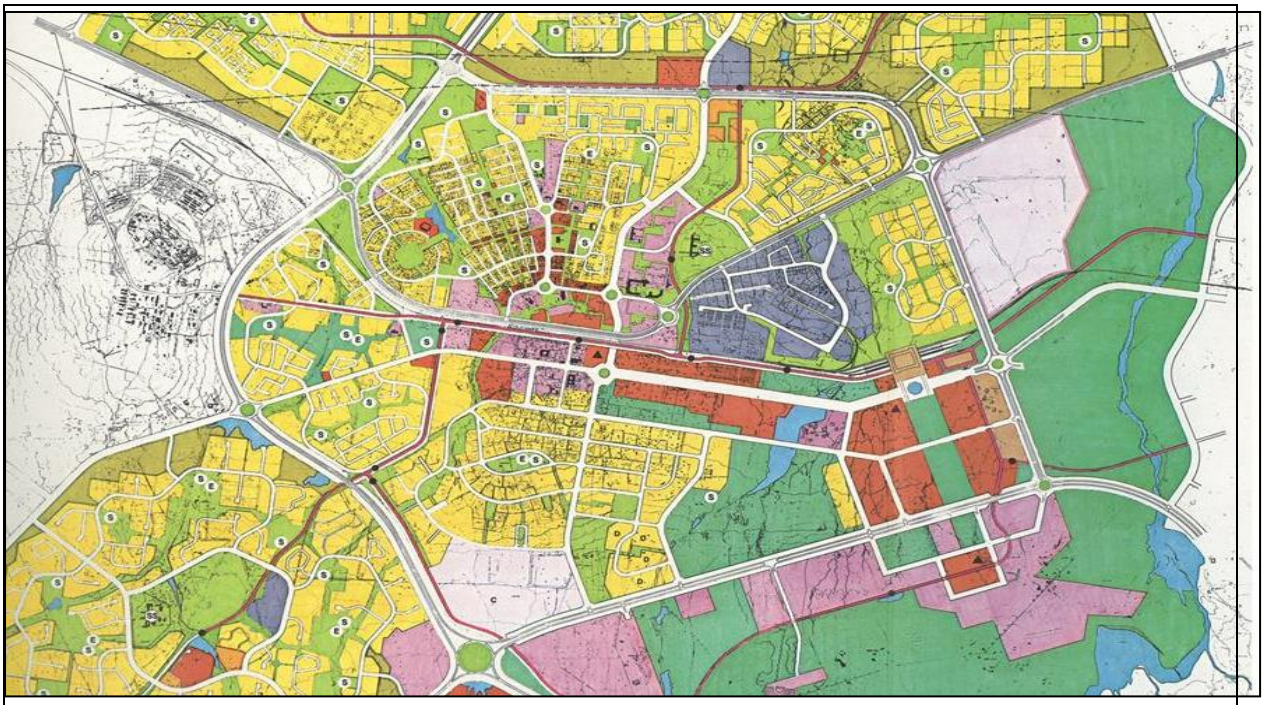
Appendix 2: Environmental Impact Assessment Matrix

Affected Component	Project Activity	Effects/Impacts	Importance (A1)	Magnitude (A2)	Permanence (B1)	Reversibility (B2)	Cumulative? (B3)	$\alpha1 x \alpha2 = \partial T$	$\beta1+\beta2+\beta3=\sigma T$	$\partial T x \sigma T = ES$	Significance	Ranking	Mobilization Phase	Construction Phase	Demobilization Phase	Operation Phase
	Movement of heavy trucks to and from construction site	Increased risk of traffic accidents	1	-2	2	3	3	-2	8	-16	Medium	-3	-1	-3	-1	0
	Improved road condition into bitumen standard.	Increased risk of traffic accidents	1	-2	[illegible]	[illegible]	[illegible]	-2	8	-16	Medium	-3	[illegible]	[illegible]	[illegible]	[illegible]
	Accidental spillage of petroleum products	Creation of risk of fire otubreaks.	1	-1	2	[illegible]	[illegible]	[illegible]	[illegible]	-14	Medium	[illegible]	[illegible]	[illegible]	[illegible]	[illegible]
Labour and Economy	Recruitment of construction workers	Creation of temporary employment for local people.	2	3	2	1	2	6	5	30	Medium	3	0	3	0	0
	Increased demand for food and other items due to presence of construction workers	Increased income generation opportunities for local people.	2	2	2	1	2	4	5	20	Medium	3	0	3	0	0
	Demobilization or closure of the project	Loss of temporary employment by local people.	2	-2	3	1	-2	-4	2	-8	Very Low	-1	0	0	-1	0
Public service infrastructure/utilities.	Relocation of existing infrastructures and utilities.	Disruption of public service infrastructure /utilities.	2	-2	2	2	2	-4	6	-24	Medium	-3	-3	0	0	0
Transportation	Excavation of road bed and road side storm water drainages.	Severance of community access.	1	-2	2	2	2	-2	6	-12	Low	-2	0	-2	0	0
	Construction of road pavement and associated drainage structures.	Disruption of traffic flow along the road sections.	1	-3	2	2	2	-3	6	-18	Low	-2	0	-3	0	0
	Movement of heavy trucks during construction.	Increased risk of traffic accidents	1	-2	2	3	3	-2	8	-16	Low	-2	0	-2	0	0
Land and natural resources	Widening or expansion of road sections.	Loss of prperties by local residents.	2	-2	3	3	2	-4	8	-32	Medium	-3	-3	0	0	0
	Increased competition for land resources.	Displacement of poor people from their land by wealthy people.	2	-2	3	3	2	-4	8	-32	Medium	-3	0	0	0	-3
	Increased exploitation of natural resources.	Increased land degradation.	2	-1	3	1	3	-2	7	-14	Low	-2	0	0	0	-2
Cultural Heritage Resources	Extraction of construction materials from borrow pits.	Destruction of archaeological artefacts.	1	-1	3	3	2	-1	8	-8	Very Low	-1	0	-1	0	0
Labour and Economy		Reduced dust emission due to improved road condition.	2	3	3	2	3	6	8	48	High	4	0	0	0	4
		Reduced road maintenance costs.	3	3	3	1	1	9	5	45	High	4	0	0	0	4
		Reduced vehicle operation and maintenance costs.	3	3	3	1	1	9	5	45	High	4	0	0	0	4

Affected Component	Project Activity	Effects/Impacts	Importance (A1)	Magnitude (A2)	Permanence (B1)	Reversibility (B2)	Cumulative? (B3)	$\alpha1 x \alpha2 = \partial T$	$\beta1+\beta2+\beta3=\sigma T$	$\partial T x \sigma T = ES$	Significance	Ranking	Mobilization Phase	Construction Phase	Demobilization Phase	Operation Phase
Atmospheric Environment	Excavation of soil materials along the road sections.	Creation of air pollution due to dust emission along the construction roads.	1	-2	2	3	3	-2	8	-16	Low	-2	0	-2	0	0
	Movement of heavy trucks along the access roads to borrow pits/quarry pits.	Creation of air pollution due to dust emission along the access roads to borrow pits /quarry pits.	2	-2	2	3	3	-4	8	-32	Medium	-3	0	-3	0	0
Acoustic Environment	Movement of mobile equipment/machinery along the construction roads..	Creation of noise nuisance and vibration to the local residents along theconstructio roads.	2	-2	2	2	3	-4	7	-28	Medium	-3	0	-3	0	0
Water Resources	Uncontrolled discharge of wastewater into the surrounding environment.	Creation of ground and surface water pollution.	2	-2	1	1	3	-4	5	-20	Medium	-3	0	-3	0	0
Terrestrial and Vegetated Environment	Soil excavations and stockpiling of soil materials.	Creation of landscape degradation	1	-2	2	3	2	-2	7	-14	Low	-2	0	-2	0	0
	Poor disposal or lack of proper solid waste management.	Creation of landscape degradation	2	-2	2	2	1	-4	5	-20	Medium	-3	0	-3	0	0
	Accidental spillage of petroelum products and waste oil.	Creation of soil pollution and Loss of aesthetic value of the surrounding environment.	1	-1	2	2	2	-1	6	-6	Very Low	-1	0	-1	0	0
	Uncontrolled floow /discharge of raw sewage waste water and constrcturction wastewater into the surrounding environment .	Creation of potential breeding sites for water borne disease vectors.	1	-3	3	2	2	-3	7	-21	Medium	-3	0	0	-3	0
Public Health and Safety	Social interaction between construction workers and local community	Increased transmission of HIV/AIDS and STIs	1	-3	3	1	3	-3	7	-21	Medium	-3	0	-3	0	0
	Operation of construction equipment / machinery and handling of hazardous materials	Creation of occupational health and safety risks	1	-2	2	1	2	-2	5	-10	Low	-2	0	-2	0	0

	Operation of construction equipment / machinery and handling of dusty construction materials	Creation of occupational health and safety risks	1	2	2	5	Moderate	2	3	0	5	Low	1	6	Medium	Possibly Significant	√	
	Operation of construction equipment / machinery.	Creation of construction related risk of accidents	1	2	2	5	Moderate	2	3	0	5	Low	1	6	Medium	Possibly Significant	√	
	Movement of heavy trucks to and from construction site.	Increased risk of traffic accidents	1	2	2	5	Moderate	2	3	0	5	Low	1	6	Medium	Possibly Significant	√	
	Accidental spillage of petroleum products.	Creation of risk of fire hazards and explosion	1	2	2	5	Moderate	2	3	0	5	Low	1	6	Medium	Possibly Significant	√	
Labour and Economy	Displacement of business and commercial activities	Loss of employment and income generation opportunities.	1	1	1	3	Small	1	1	3	5	Low	1	6	Medium	Not Significant		√
	Recruitment of construction workers	Creation of temporary employment for local people.	1	3	2	6	Moderate	3	0	3	6	Medium	2	8	Medium	Likely Significant	√	
	Increased demand for food and other items due to presence of construction workers	Creation of income generation opportunities for local people.	1	3	2	6	Moderate	3	0	3	6	Medium	2	8	Medium	Possibly Significant	√	
	Demobilization or closure of the project	Loss of temporary employment by local people.	1	1	3	5	Moderate	3	0	3	6	Medium	2	8	Medium	Possibly Significant	√	
Community Services and Infrastructure	Excavation of road bed and road side storm water drainage ditches.	Severance of community access.	1	3	3	7	Moderate	3	3	3	9	High	2	11	Very High	Likely Significant	√	
	Relocation of existing infrastructures and utilities.	Disruption of public infrastructure and utility .	3	1	1	5	Moderate	3	1	3	7	Medium	3	10	High	Likely Significant	√	
	Movement of heavy trucks during construction	Disruption of traffic flow along the main road	1	3	2	6	Moderate	2	2	0	4	Low	2	6	Medium	Possibly Significant	√	
Current Land and Resource Use	Increased value of land.	Displacement of poor people from their land by wealthy people.	3	3	3	9	Large	3	3	3	9	High	2	11	Very High	Likely Significant	√	
	Increased land use pressure.	Increased over-exploitation of natural resources and creation of land degradation.	3	3	3	9	Large	3	2	2	7	Medium	2	9	High	Likely Significant		√
Cultural Heritage Resources	Soil excavations during road construction.	Destruction of archaeological artefacts.	1	1	1	3	Small	1	3	2	6	Medium	3	9	Medium	Not Significant		√
	Extraction of construction materials from borrow pits.	Destruction of archaeological artefacts.	1	2	2	5	Moderate	2	3	2	7	Medium	3	10	Medium	Possibly Significant	√	

Appendix 3: Dodoma City Land Use Plan



KEY:

- Residential
- P Alternative Presidential/ Vice Presidential Residence
- D Special Diplomatic Use
- Community Facilities and Offices
- Commercial
- Hotel
- Government Offices and Institutions
- Unforeseen Government or Institutional Use
- C Technical College
- Industry
- Community Park
- E Community Education Centre
- S Primary School
- SS Existing Secondary School
- Recreation Park
- Open Space Core
- Busway
- Bus Stop
- Transportation Terminal
- Water Body
- Airport Restricted Zone

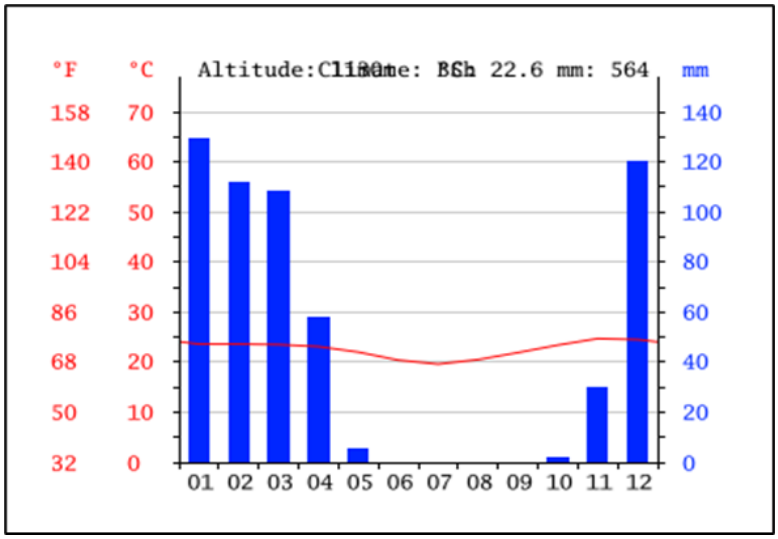
Appendix 4: Climatological Data of Dodoma City

Dodoma's climate is a local steppe climate. In Dodoma, there is little rainfall throughout the year. This location is classified as BSh by Köppen and Geiger. The average temperature in Dodoma is 22.6 °C. In a year, the average rainfall is 564 mm.

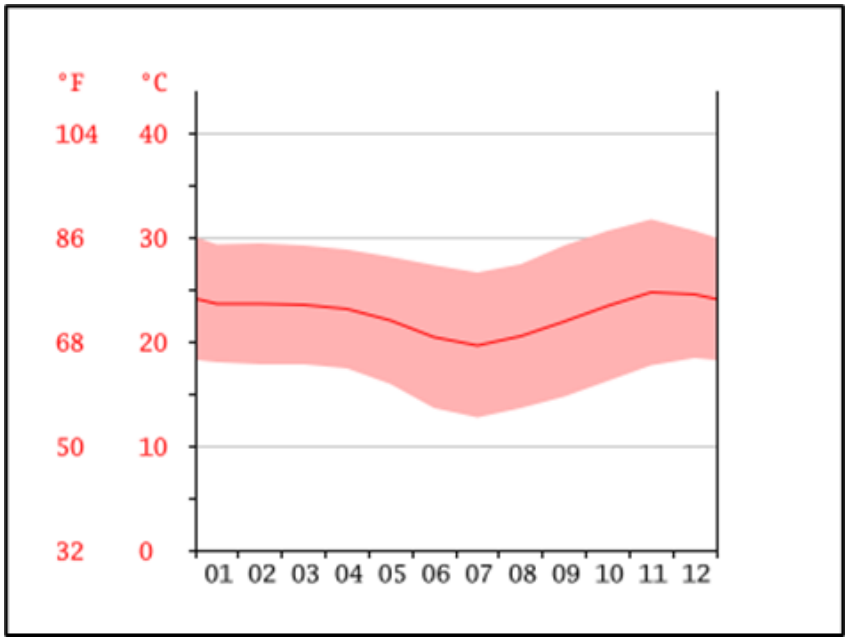
Precipitation is the lowest in June, with an average of 0 mm. The most precipitation falls in January, with an average of about 129 mm. The difference in precipitation between the driest and wettest months is 129 mm.

November is the hottest month of the year with an average temperature of about 24.7 °C. July is the coldest month of the year with an average temperature of about 19.6 °C. During the year, the average temperatures vary by 5.1 °C.

A. CLIMATE GRAPH // WEATHER BY MONTH DODOMA



B. AVERAGE TEMPERATURE DODOMA



C. DODOMA WEATHER BY MONTH // WEATHER AVERAGES

	January	February	March	April	May	June	July	August	September	October	November	December
Avg. Temperature (°C)	23.6	23.6	23.5	23.1	22	20.4	19.6	20.5	21.9	23.4	24.7	24.5
Min. Temperature (°C)	18	17.8	17.8	17.4	15.9	13.6	12.7	13.6	14.7	16.2	17.7	18.4
Max. Temperature (°C)	29.3	29.4	29.2	28.8	28.1	27.3	26.6	27.4	29.2	30.6	31.7	30.6
Avg. Temperature (°F)	74.5	74.5	74.3	73.6	71.6	68.7	67.3	68.9	71.4	74.1	76.5	76.1
Min. Temperature (°F)	64.4	64.0	64.0	63.3	60.6	56.5	54.9	56.5	58.5	61.2	63.9	65.1
Max. Temperature (°F)	84.7	84.9	84.6	83.8	82.6	81.1	79.9	81.3	84.6	87.1	89.1	87.1
Precipitation / Rainfall (mm)	129	112	108	58	5	0	0	0	0	2	30	120

Appendix 5: Environmental And Social Demobilization Checklist

Instruction:
Put a tick (✓) at appropriate place and always take photographs for illustration.

S/n	Description of Works	Yes	No	NA*	Comments	Target Completion Date
1.	**Employment and Workers welfare**					
1.1	Have all employees been paid their terminal benefits before retrenchment?					
1.2	Has the Contractor NSSF and WCF contributions for all employees before retrenchment?					
2.	**Camp Sites and Office Facilities**					
2.1	Has all camp site and office facilities been demolished or handed over to the relevant authorities?					
2.2	Has the all the bare areas been scarified and planted trees after demolition or removal of camp site or office buildings?					
3.	**Solid Waste Management**					
3.1	Has all construction and demolition solid wastes been removed?					
3.2	Has all hazardous wastes been removed (e.g. waste oils, used batteries, used tyres, scrap metals, etc)					
3.3	Has all excavated soil and spoil materials been removed?					
3.4	Has the tempoerary solid waste collection bay been dismannlted and remvoed?					
4.	**Soil Erosion and Sedimentation Control**					
4,1	Has all execess construction mateirals been removed?					
4.2	Has all sediment control structures been reomved?					
4.3	Has suceptible areas to erosion been adequaltely stabilized ?					
4.4	Have all stockpiles been removed or appropriately landscaped?					

S/n	Description of Works	Yes	No	NA*	Comments	Target Completion Date
4.5	Has all temporary storm water control system (e.g. drains, settling ponds, etc.) been removed?					
5.	**Groundwater and Dewatering Contol**					
5.1	Has all dewatering equipment (pumps, hose pipes, etc.) been removed?					
5.2	Has all settlement tanks / water bowsers been removed?					
5.3	Has all temporary lagoons, settlement basins been removed and retunred to its orginal state?					
5.4	Has all inert matetrials from laggons been disposed of appropriately?					
5.5	Have all well casing been removed?					
5.6	Have all wells been adequately backfilled?					
5.7	Have all wells been caped with concrete (500 mm)?					
6.	**Workshops/Garages, Vehicle Washing and Refuleing Areas**					
6.1	Have all vehicle maintenace, washing and refuleing areas been scanned for soil decontamination?					
6.2	Has all contaminated soil been collected and appropriately diposed of?					
6.3	Has all contaimineated water been removed from sumps, intercetors, etc?					
6.4	Has all cncrete bunds and floor slabls been scanned for signs of contamination?					
6.5	Has all contaminated cocnrete (portion of floor slabs, bunds and refueling aprons) been removed as hazardous wastes?					
7.	**Fuel and Chemical Storage Areas**					
7.1	Has all chemical substances and PCLs been removed?					

S/n	Description of Works	Yes	No	NA*	Comments	Target Completion Date
7.2	Has chemical and bulk fuel stoagre areas been scanned for oil contamination?					
7.3	Has all contaminated soil been collcted and appropriately dispos of?					
7.4	Have bulk fuel tanks been remvoed?					
7.5	Have conrete bunds been scanned for signs of contamination?					
7.6	Have alll contaminated conrete (portions of floor slabs, bunds, and refuleing apron been removed as hazardous wastes?					
8.	**Sanitary and Wastewater Disposal Facilities**					
8.1	Have all septic tanks from temporary facilites been emptied?					
8.2	Have all spetic tanks been removed?					
8.3	Have all spetic tanks drainage networks and insepction manholes been removed?					
8.5	Have all raw sewage discharge chambers or pti latrines been demolished and backfilled?					
9.	**Landscape Management and Run-off Control**					
9.1	Has the contractor planted grass on bare areas around the buildings?					
9.4	Has the contractor used pavement blocks instead of conrete on foot paths to promote infiltration and minimze run-off?					
10.	**Borrow pits/Quarry Sites Rehabilitation**					
10.1	Has all borrow ptis been properly rehsped and backfilled with surounding soil materials?					
10.2	Has all access roads to borroiw pits beenscarified and planted grass?					

S/n	Description of Works	Yes	No	NA*	Comments	Target Completion Date
10.2	Has the usable borrow pit for livestock water drinking been properly reshaped and handed over to local authority?					

Note: *NA = Not Applicable

Appendix 6: CHANCE FINDS PROCEDURES

There are no known sites of cultural heritage of archaeological importance along the existing overhead line. There are also no proclaimed or potential sites for proclamation in the project area. The Chance Find Procedure is a project-specific procedure that outlines actions required if previously unknown cultural heritage resources (CHRs), particularly archaeological resources, are accidentally encountered during project construction or operation. It is a process that prevents chance finds from being disturbed until an assessment by a competent specialist is made and actions consistent with the requirements are implemented.

Purpose

This document presents the Chance Finds Procedure for the construction phase of the Project. Its purpose is to provide information on known cultural heritage sites within the project area and to define the response procedure in the event that a Chance Find is made. In the event of ground work being undertaken this procedure shall be implemented. Ground works shall be monitored by at least one member of the Contractor staff that has received cultural heritage training.

Scope

This Chance Finds Procedure outlines the process to be carried out upon coming across a Chance Find during the pre-construction and construction phase of the Project. This procedure is applicable mainly to ground- breaking construction activities carried out by Contractor and Sub-contractors works sites.

This Procedure is applicable to all activities conducted by the personnel, including contractors, that have the potential to uncover a heritage item/site. The procedure details the actions to be taken when a previously unidentified and potential heritage item/site is found during construction activities. It also outlines the roles and responsibilities and the response times required from both project staff, and any relevant heritage authority.

RESPONSIBLE PARTIES in implementation of the Procedures

TANROADS

The head office guarantees the availability of the economic, human and technical resources needed to ensure that cultural property resources are preserved and protected. It entails the Environment Department and Finance Department among others.

Employer HSE Manager

a) Shall review and approve this procedure;
b) Shall review permits and their validity;
c) Collation of Chance Find reports for inclusion into the monthly reporting to the Lenders; and
d) Key contact to the Cultural Heritage Specialist.

Contractor HSE Manager

a) Shall manage all on-site ground-breaking activities in compliance with this procedure;

b) Shall work to ensure there is no impact on known cultural heritage sites within the construction areas;
c) Shall implement this procedure;
d) Shall audit activities onsite and ensure compliance;
e) Shall ensure that all permits are obtained and in place prior to outset of work;
f) Shall implement the monitoring programme and report on progress and submit as part of the monthly reporting to the Employer;
g) Shall monitor Subcontractors to ensure the requirements and responsibilities set out in this procedu are me
h) Shall undertake consultation with relevant key stakeholder;
i) Shall implement and update cultural heritage reference materials such as educational posters in the workers accommodation and temporary construction facilities;
j) Shall ensure all on-site personnel are properly trained for their job functions and responsibilities;
k) Key contact to the Employer HSE Manager who would then consult with a Cultural Heritage Specialist; and
l) Include Chance Finds reports from the Project Cultural Heritage Specialist in the monthly site progress reports.

Cultural Heritage Specialist, Department of Museums and Monuments

A qualified Cultural Heritage Specialist shall be retained by the Contractor for the duration of the construction works to provide oversight of this Chance Finds Procedure and remain on-call on an as-needed-basis. Their responsibilities include, in the case of a Chance Find:

a) Shall undertake consultation with relevant key stakeholders;
b) Shall provide and follow the procedures for the documentation and assessment of Chance Finds to determine if additional investigations are required;
c) Shall follow the protocols for consultation with the national regulatory bodies to design and implement additional investigations (if required);
d) Shall undertake record keeping and chain of custody for movable finds;
e) Shall follow expert verification procedures;
f) Shall produce Chance Find reports for issue to the Employer Site HSE Manager; and
g) Shall provide initial Chance Find training through Toolbox Talks to the Contractors and Subcontractors.

CHANCE FINDS PROCESS

A qualified Cultural Heritage Specialist shall be retained by the Contractor to provide oversight of this Chance Finds Procedure and remain on-call on an as-needed-basis and shall only conduct field monitoring if the Project either encroaches on areas of known archaeological sensitivity or encounters Chance Finds. The Cultural Heritage Specialist must be specifically notified of the construction programme and when ground disturbing works are planned within or near specific areas of concern.

A Chance Find can be reported by any construction employee. As a result, it is necessary to provide cultural heritage training to all Project construction staff and Sub-contractors.

Training can be undertaken by a Tool Box Talk, guided by the qualified Cultural Heritage Specialist. Overall, any Chance Find shall not be disturbed further until an assessment by the Cultural Heritage Specialist is made and actions consistent with the requirements of this Chance Finds Procedure are implemented.

Steps to be taken upon identification and/or exposure

Cultural Resources Artefacts and Cultural Chance Finds

During the period of the construction of the project infrastructure which involves excavations, it is possible that chance finds shall be encountered.

These may include the following:

a) Archaeological heritage which has remained unnoticed in the past;
b) An encounter with a grave containing human remains which the local residents may have not mentioned at the survey stage; and
c) An encounter with a sacred site which was not mentioned at the survey stage.

Procedure

In order to avoid potential damage to cultural property discovered during construction, the following shall apply:

a) Workers must be vigilant to any relics found during excavation;
b) In case of a discovery during the excavation, workers must immediately report the findings to the foreman;
c) The Foreman must stop the work immediately and communicate the findings to the Supervisor;
d) The supervisor then communicates the findings to the Contractor Manager;
e) The Contractor Manager then notifies TANROADS headquarters;
f) Any further excavations or continuation of the infrastructure development at the Site of the discovered heritage shall be undertaken only with the approval of the Department of Museums and Monuments;
g) Should the Conservator of Antiquities from the Department of Museums and Monuments confirm that the discovered resource falls within the heritage resource description, he/she shall report the resource to the Minister of Tourism, Heritage and Antiquities for preservation and protection;
h) Rescue excavation or in-situ conservation shall be proposed based on the disturbance likely to be caused by the project or in relation to cost versa via value of the heritage resource;
i) The TANROADS shall then apply for either an excavation or preservation in-situ license of the discovered resource. The feasible proposal shall then be executed. In case of in-situ conservation, the site shall be managed and open to the communities and tourists that access the project area; and
j) All chance finds shall be recorded in the chance find form.

The project activities shall then continue after the following have taken place:

a) In the case of archaeological artefacts discovery, TANROADS shall inform the National Museum and grant a period where specialists from the Department of Museums and Monuments excavate and curate the artefacts professionally.
b) In the case of discovered human remains the police shall have to be notified and either the remains are taken for forensic investigation or the ward/village authorities sanction the reburial of the remains at another location. The Contractor then meets the relocation and reburial expenses.

c) In the case of an encounter with an unknown sacred site, relocation ceremonies shall be undertaken by the custodians of the site and the contractor then meets the relocation expenses.

ADDITIONAL INFORMATION MANAGEMENT OPTIONS FOR PCRS

Under this, the following ought to be undertaken:

a) **Site avoidance:** If the boundaries of the site have been delineated, attempt must be made to redesign the proposed development to avoid the site;
b) **Mitigation:** If it is not feasible to avoid the site through re-design, it shall be necessary to sample it using data collection program prior to its loss. This could include surface collection and/or excavation; and
c) **Site Protection:** It may be possible to protect the site through the installation of barriers during the time of the development and/or possibly for a longer term. This could include erection of high visibility fencing around the site or covering the site area with a geo-textile and then capping it with fill. The exact prescription would be site- specific.

Management of replicable and non-replicable heritage

Different approaches for the finds apply to replicable and non-replicable heritage. Replicable heritage Where tangible cultural heritage that is replicable and not critical is encountered, mitigation measures shall be applied.

The mitigation hierarchy is as follows:

a. Avoidance;
b. ***Minimization of adverse impacts*** and implementation of restoration measures, *in situ*;
c. ***Restoration of the functionality*** of the cultural heritage, in a different location;
d. ***Permanent removal*** of historical and archaeological artefacts and structures;
e. ***Compensation of loss*** - where minimization of adverse impacts and restoration not feasible. Non-replicable heritage.

Most cultural heritage is best protected by *in situ* preservation, since removal is likely to result in irreparable damage or even destruction of the cultural heritage.

Non-replicable cultural heritage must not be removed unless all of the following conditions are met:

a. There are no technically or financially feasible alternatives to removal;
b. The overall benefits of the project conclusively outweigh the anticipated cultural heritage loss from removal; and

Any removal of cultural heritage must be conducted using the best available technique advised by relevant authority and supervised by archaeologist.

Human Remains Management Options

There are two possible courses of action:

a. ***Avoidance:*** The road project may require re-alignment to completely avoid the burial grounds where such lie in its RoW. An assessment shall be made as to whether the remains may be affected by residual or accumulative impacts associated with the road development, and properly addressed by a comprehensive management plan;
b. ***Exhumation:*** Exhumation of the remains in a manner considered appropriate and acceptable to the cultures and norms of the owners of the burial grounds/graves. This

shall involve pre-identification of the potential alternate site for burial of the remains that are to be exhumed. Certain ceremonies agreed between the project and clan responsible for the graves shall need to be worked out and followed before on set of exhumation of the remains can recommence.

TRAINING/CAPACITY BUILDING FRAMEWORK

Courses of information and recognition of the cultural heritage for all employees and contractor employees, especially in regards to the implementation of the chance finds procedure. All personnel, especially those working on earth movements and excavations, are to be inducted on the identification of potential heritage items/sites and the relevant actions for them with regards to this procedure during the Project induction and regular toolbox talks.

During the Project induction meeting, the contractor and subcontractors shall be made aware of the presence of the on-call Cultural Heritage Specialist. Here, cultural heritage training shall also be undertaken.

The objective of cultural heritage training is for the contractor and sub-contractors to manage potential impacts to known and unknown cultural heritage sites by facilitating the identification and reporting of potential Chance Finds encountered during construction works. This can be carried out through a Toolbox Talk.

The Contractor HSE Manager is responsible for providing training through a Toolbox Talk for all construction staff. The Toolbox Talk shall address:

a. Defining Chance Finds;
b. Identifying Chance Finds in the field;
c. Explanation as to why protection measures need to be put in place (avoid environmental harm and avoid prosecution/ legal penalties);
d. The steps to be taken upon identification and/or expose;
e. Do's and dont's; and
f. Roles and responsibilities of construction Contractors and Sub-contractors in the process and the roles and responsibilities of the Cultural Heritage Specialist.

Monitoring

During pre-construction and construction, where relevant the protection of cultural/archaeological sites identified by the local community shall be monitored to ensure their protection. Any chance finds shall also be recorded and monitored; and audit undertaken to ensure that the procedure set out in the chance finds procedure was followed.

Contact

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Appendix 7: Minimum Code Of Conduct For Project Workers
A: Implementing ESHS and OHS Standards.

Preventing Gender Based Violence

I, acknowledge that adhering to environmental, social, health and safety (ESHS) standards, following the project's occupational health and safety (OHS) requirements, and preventing Gender Based Violence (GBV) is important.

The Company considers that failure to follow ESHS and OHS standards, or to partake in activities constituting GBV—be it on the work site, the work site surroundings, at workers' camps, or the surrounding communities—constitute acts of gross misconduct and are therefore grounds for sanctions, penalties or potential termination of employment. Prosecution by the Police of those who commit GBV may be pursued if appropriate.

I agree that while working on the project I shall:

a. Consent to Police background check.
b. Attend and actively partake in training courses related to ESHS, OHS, and GBV as requested by my employer.
c. Shall wear my personal protective equipment (PPE) at all times when at the work site or engaged in project related activities.
d. Take all practical steps to implement the contractor's environmental and social management plan (C-ESMP).
e. Implement the OHS Management Plan.
f. Adhere to a zero-alcohol policy during work activities, and refrain from the use of narcotics or other substances which can impair faculties at all times.
g. Treat women, children (persons under the age of 18), and men with respect regardless of race, colour, language, religion, political or other opinion, national, ethnic or social origin, property, disability, birth or other status.
h. Not use language or behaviour towards women, children or men that is inappropriate, harassing, abusive, sexually provocative, demeaning or culturally inappropriate.
i. Not sexually exploit or abuse project beneficiaries and members of the surrounding communities.
j. Not engage in sexual harassment of work personnel and staff —for instance, making unwelcome sexual advances, requests for sexual favours, and other verbal or physical conduct of a sexual nature is prohibited. E.g. looking somebody up and down; kissing,

howling or smacking sounds; hanging around somebody; whistling and catcalls; in some instances, giving personal gifts.

k. Not engage in sexual favours —for instance, making promises of favourable treatment (e.g. promotion), threats of unfavourable treatment (e.g. loss of job) or payments in kind or in cash, dependent on sexual acts—or other forms of humiliating, degrading or exploitative behaviour.
l. Not use prostitution in any form at any time.
m. Not participate in sexual contact or activity with children under the age of 18 including grooming, or contact through digital media. Mistaken belief regarding the age of a child is not a defence. Consent from the child is also not a defence or excuse.

Unless there is the full consent by all parties involved, I shall not have sexual interactions with members of the surrounding communities. This includes relationships involving the withholding or promise of actual provision of benefit (monetary or non-monetary) to community members in exchange for sex (including prostitution). Such sexual activity is considered "non-consensual" within the scope of this Code.

Wherever possible, ensure that another adult is present when working in the proximity of children.

Not invite unaccompanied children unrelated to my family into my home, unless they are at immediate risk of injury or in physical danger.

Not use any computers, mobile phones, video and digital cameras or any other medium to exploit or harass children or to access child pornography (see also "Use of children's images for work related purposes" below).

Refrain from physical punishment or discipline of children.

Refrain from hiring children for domestic or other labour below the minimum age of 14 unless national law specifies a higher age, or which places them at significant risk of injury.

Comply with all relevant local legislation, including labour laws in relation to child labour and World Bank's ESF standards governing child labour and minimum age.

Take appropriate caution when photographing or filming children.

Use of children's images for work related purposes

a) When photographing or filming a child for work related purposes, I must:

b) Before photographing or filming a child, assess and endeavour to comply with local traditions or restrictions for reproducing personal images.

c) Before photographing or filming a child, obtain informed consent from the child and a parent or guardian of the child. As part of this I must explain how the photograph or film shall be used.

d) Ensure photographs, films, videos and DVDs present children in a dignified and respectful manner and not in a vulnerable or submissive manner. Children should be adequately clothed and not in poses that could be seen as sexually suggestive.

e) Ensure images are honest representations of the context and the facts.

f) Ensure file labels do not reveal identifying information about a child when sending images electronically.

g) Sanctions

h) I understand that if I breach this Individual Code of Conduct, my employer shall take disciplinary action which could include:

i) Informal warning.

j) Formal warning.

k) Additional Training.

l) Loss of up to one week's salary.

m) Suspension of employment (without payment of salary), for a minimum period of 1 month up to a maximum of 6 months.

n) Termination of employment.

o) Report to the Police if warranted.

I understand that it is my responsibility to ensure that the environmental, social, health and safety standards are met. That I shall adhere to the occupational health and safety management plan. That I shall avoid actions or behaviours that could be construed as GBV. Any such actions shall be a breach this Individual Code of Conduct. I do hereby acknowledge that I have read the foregoing Individual Code of Conduct, do agree to comply with the standards contained therein and understand my roles and responsibilities to prevent and respond to ESHS, OHS, GBV issues. I understand that any action inconsistent with this Individual Code of Conduct or failure to act mandated by this Individual Code of Conduct may result in disciplinary action and may affect my ongoing employment.

Signature: _____

Printed Name: _____

Title: _____

Date: _____

GBV/SEA SSESSMENT FORM

A. GBV/SEA-related issues	**YES**	**NO**
1. Are there grievance-handling procedures in place for SEA/SH cases?		
2. Is there a policy for the handling of SEA/SH cases?		
a. Is the policy available to all staff, beneficiaries, and potential survivors?		
b. Is the policy written in the local language?		
3. Does the SEA/SH grievance mechanism include the following:		
a. Clearly understood entry points for people to submit grievances?		
b. Clear responsibilities regarding who registers SEA/SH allegations?		
c. Procedures for investigating SEA/SH allegations?		
d. A system for recording SEA/SH allegations and outcomes?		
e. Procedures for protecting the confidentiality of survivors?		
B. Staff management		
1. Is there a SEA/SH grievance manual for staff?		
2. Do the grievance policy and/or procedures provide guidance on:		
a. Types of SEA/SH cases?		
b. Information to collect from survivors?		
c. Referral pathways to be used to provide support to survivors?		
3. Are the grievance mechanism's policy and procedures regarding SEA/SH cases well communicated to all staff?		
4. Are adequate resources allocated for the grievance mechanism to function effectively?		
5. Is training provided to staff members managing SEA/SH cases?		
	Yes	**No**
Communications with users		
1. Are project-affected people told how to submit SEA/SH complaints?		
a. Are communications materials about the grievance mechanism—such as informational brochures and posters—prominently displayed and readily accessible?		
b. Do the communications materials include clear explanations regarding:		
❖ How to report a SEA/SH incident?		
❖ To whom?		
❖ What to expect in terms of available services?		
❖ What to expect in terms of confidentiality?		
c. Is the information about the SEA/SH GM available in the local languages?		
2. Can survivors submit their grievance:		
a. In person?		
b. In writing?		
c. By email?		
d. By SMS (short message service/text message)?		
e. At a dedicated website/online platform?		

f. On a telephone hotline?		
3. Can the grievance mechanism be accessed free of charge?		
4. Are users promised confidentiality?		
Recording of grievances		
1. Are there clear guidelines about how to respond to a survivor disclosing a SEA/SH allegation?		
2. Are they readily available?		
3. Are staff members aware of what data are appropriate for them to collect from survivors and for what purposes?		
4. Are staff members trained on how to receive, document/record, and respond to SEA/SH allegations?		
5. Are SEA /SH allegations logged and documented?		
6. Are SEA/SH allegation report forms readily available?		
7. Are the outcomes and responses to all SEA/SH cases recorded?		
Business standards		
1. Are there clear procedures in place to follow-up on received SEA/SH allegations?		
2. Is there evidence that substantiated SEA/SH allegations have led to disciplinary actions or contractual consequences?		
3. Are there clear guidelines in place to help determine when a case is considered closed?		
Reporting		
1. Is anonymized SEA/SH data being regularly reported? (Only three basic indicators should be included: age of survivor, sex of survivor, and whether or not the incident is project-related .)		
	Yes	**No**
G. Survivor-centricity and consent		
1. Do women and child survivors have the reporting their allegation to a female staff member?		
2. Are special safeguards in place to allow survivors under the age of eighteen to submit grievances?		
3. Is survivor consent over the use and sharing of data systematically collected?		
4. Is a survivor consent form readily available in the local languages?		
Data storage and confidentiality		
OFFLINE		
1. Are cases received in a private setting or a dedicated space that maintains confidentiality?		
2. Are SEA/SH allegations recorded separately from other types of grievances?		
3. Are the survivor files and SEA/SH data stored with adequate precautions to protect client anonymity and safety, for instance in secure files and locked drawers or cabinets?		
4. Is there a coding system for paper files to anonymize the data, such as identifying survivors by a code instead of by name?		

5. Are there contingency plans for the destruction or relocation of paper files during an emergency evacuation?		
6. Are staff members aware that survivor files should not be discussed with anyone unrelated to the case?		
ONLINE		
1. Is there an encryption system for online SEA/SH case filing?		
2. Is the software used to record allegations password-protected by each agency?		
3. Are precautions being taken to prevent the loss of stored electronic data, such as antivirus protection and database backup?		
Referrals and data-sharing		
1. Are written standard operating procedures in place to facilitate joint action by different agencies?		
2. Is an information sharing protocol readily available among the various agencies and GBV service providers?		
4. Is a referral protocol readily available with up-to-date information about where to refer survivors for care and support?		
5. Is a care action plan template readily available?		
6. Do the services offered to survivors by service agencies match international quality standards?		

B: MINIMUM CODE OF CONDUCT FOR CONTRACTOR ON ENVIRONMENTAL, SOCIAL, HEALTH AND SAFETY ASPECTS.

Technical Specifications/Employer Requirement.

The Technical Specification/Employer's requirements have been prepared to guide the undertaking of the Environmental, Social, Health and Safety (ESHS)" for the proposed road projects. The Technical Specification/Employer requirements are subject to the variations and additions as deemed necessary by the Employer. Among others, the Technical Specification to be included in the Bidding Documents are as follows:

a. The Qualified Environmental and /or Social Specialist and Health & Safety Officers shall be employed by the Contractor before the actual execution of the construction works. The Environmental and /or Social Specialist and Health & Safety Officers shall be responsible for preparation of the Specific Environmental and Social Management Plan (ESMP); Borrow Pit and Quarry Operation Plan, Specific Health and Safety Management Plan (HSMP); Environmental Awareness Programme, HIV/AIDS Awareness Programme, Occupational Health and Safety Awareness Programme and Road Safety Awareness Programme.
b. The working permits shall be obtained by Contractor and its subsidiaries prior to the actual works of the construction activities. The permits among others shall include; Working Permit for Non-Resident experts, Water-Use Permit, EIA Permit, Working Permit in Protected Areas, OSHA Permit, Explosive Use Permit and other permits required by the National Laws. The obtained permits and their status shall be reported regularly.
c. The Specific Environmental and Social Management Plan (ESMP) shall be prepared and submitted to Client for approval prior to the execution of the proposed road project. The ESMP among others shall include sub-plans such as Environmental Management Plan, Monitoring Management Plan, Emergency Preparedness Plan, Waste Management Plan, Grievances Preparedness Plan, Borrow Pits and Quarry Site Operations Plan and Reinstatement Plan.
d. The specific Health and Safety Management Plan (HSMP) shall be prepared and submitted to the Client for approval prior to the execution of the proposed road project. The HSMP among others, shall include sub-plans such as the Occupational Health and Safety Awareness Programme, Traffic Management Plan, Monitoring Management Plan, Emergency Preparedness Plan, Accident Management Plan. The Occupational Health and Safety Awareness Program shall cover among others, proper use of First Aid Kits, Fire marshal training, Proper use of PPE equipment's, emergency First Aid delivery, self-prevention of epidemic and pandemic diseases including Malaria, diarrhea and tuberculosis.
e. The Traffic Management Plan (TMP) shall be prepared and submitted to the Engineer for approval prior to commencement of the construction works to ensure smooth traffic flow and improve safety of road users, adjacent communities especially children, the elderly and people with disabilities during construction period. This plan shall include but not limited to the methods of protection of communities, give details of operation hours, types and number of safety devices, details of the location and design of diversion roads; temporary structures, barricades, temporary signs, flagmen,

signals and other physical features necessary to accommodate traffic flow during construction.

f. The HIV/AIDS awareness programme shall be prepared and submitted to the Client for approval prior to be implemented to the communities at all villages/street/centers and to all project workers along the road project. The programme shall cover among others, Training on HIV/AIDS Prevention and control, HIV awareness and Counselling, VTC and Testing, capacity building to peer educator/mentor. The programme activities shall be reported quarterly.
g. The Road Safety Awareness Programme shall be prepared and submitted to Client for approval prior to be implemented to communities at all villages/street/centers along the road project to road users, and to all project workers. The programme shall cover among others, traffic management, proper use of road signs, safe driving to drivers and cyclic, safe use of road to pedestrians, regular sensitization on accidents risks, control measures to the Machines' operators, construction sequencing, public information announcements, use of traffic control devices and other activities designed to minimize traffic disruption. The programme activities shall be reported quarterly.
h. Labor recruitment for both (skilled and unskilled) shall adhere to the Labor Laws during the project implementation and ensure the laborers are given the Contracts, registered with National Social Security Schemes and contribute to ''Pay as You Earn (PAYEE) Tax''. The Monthly Progress Report should be produced reflecting the number of skilled and unskilled labor, number Contracts provided, gender consideration, types of social security schemes chosen. (workers are free to choose their preferred schemes).
i. Vegetation (grasses) and Trees shall be planted along the road project in harmony with the road categories and function. The Vegetation, (trees and grasses) shall be planted at the exhausted areas such as borrow pits, quarry areas, campsite, diversion and stockpiled materials at storage yards in the major village streets and centers. Monthly Progress reports should be produced reflecting a number of trees planted, area covered with grass and shrubs, number of villages along the road planted with trees, number of borrow pits and quarry site planted with trees/grass.
j. The air quality baseline data shall be obtained along the road project during the mobilization phase prior to the execution of the actual, construction works. The air quality analysis shall be done at the major villages/street/centers along the project road during the construction at least twice a year (during dry and wet season) as stipulated in the ''Environmental Code of Practice for Road Works of 2009''. The air quality data shall be reported quarterly.
k. The water quality baseline data shall be obtained along the road project during the mobilization phase prior to the execution of the actual construction works. The analysis shall be done to all water bodies during road construction at least twice a year (during dry and wet season) as stipulated in the ''Environmental Code of Practice for Road Works of 2009''. The water quality data shall be reported quarterly.

l. The dust control shall be done by water sprinkling at the construction site, borrow pits and quarry site access road, quarry site, diversion road and along the major centers at least three time per day during dry season. Wet crushing shall be deployed. The dust control measures shall be reported in monthly and quarterly progress reports.
m. Noise and vibration shall be avoided at the major villages/street/centers along the road project during construction phase. The impacts shall be avoided by conducting regular maintenance of operation vehicles and machinery, blasting works shall be done during day time after notifying the communities along the area as stipulated into ''Environmental Code of Practice for Road Works of 2009''. The noise and vibration control measures shall be reported in monthly progress reports.
n. Solid waste collection and separation or sorting shall be done on construction site, campsites, workshop and other project facilities in accordance to standard stipulated into ''Environmental code of practice for Road Works, 2009''. The hazardous solid waste shall be collected for disposal by authorized dealer. Other waste shall be disposed in the authorized dumpsite or managed at site. The solid waste control measures shall be reported in the monthly progress reports.
o. Liquid waste collection shall be done on construction site, campsites, workshop and other project facilities in accordance with the standard stipulated in the ''Environmental Code of Practice for Road Works of 2009''. The hazardous liquid waste shall be collected by the authorized dealer for disposal. Waste water from toilets and kitchen, cafeteria shall be managed on site through septic tanks and souk away pits. The liquid waste control measures shall be reported in the progress reports.
p. Prepare Grievance Redress Mechanism for resolving grievances related to the road project. Prepare a grievance register form for registering all the grievances that may arise during the construction. The progress report shall be prepared indicating how the grievances were resolved.
q. The PPE shall be provided to all workers on site and ensure proper regular use of them by workers measures to enforce the use of PPE should be applied. The PPE shall include groves, gumboot, overall, sun google, ear musk, reflective jackets, helmet, safety signs and other as necessary. The provision and the use of PPEs to workers shall be reported in the monthly progress reports.
r. Temporally speed calming measures, road signs, barricades and warning signals shall be installed to the highly populated areas such as at road section under works, approach to trading centers, streets, villages, school premises and health centers on the road project. The installed road signs, barricades and warning signals shall be standard and reflective. Damaged and vandalized road signs shall be replaced immediately within 3 days. Any accident that may occur on daily basis shall be reported to the traffic police and accidents records must be kept and reported. Status of road safety measures shall be reported on monthly basis.
s. The Billboard signs shall be installed at the begging and the end of the road project and among others the billboard shall include a message on HIV/AIDS prevention. Other billboards with HIV/AIDS and Environmental management massage shall be installed at all major centers/villages along the project road.

Among others, the undertaking of the road project activities shall comply with the following documents requirements:

- Environmental Management Act, 2004, EIA and Audit Regulations of 2005;
- Environmental Code of Practice for Road works, 2009;
- Environmental and Social Impact Assessment Report (ESIA) for the project;
- Road Sector Compensation and Resettlement Guidelines, 2009;
- Road Act, Nº.13 of 2007 and Road Management Regulation of 2009;
- Land Act, Nº.4&5 of 1999, Land Compensation Regulation of 2001;
- Occupational Health and Safety Act (OSHA, 2003);
- Traffic Act, 1996; and
- TANROADS Environmental and Social Safeguards Policy, 2018
- WB-Environmental and Social Standards (ESS-1,2,3,4,5,6,8,9 and 10)

Copies of the relevant National Laws, Guideline, Regulation and Donors E&S Policies can be obtained from:

Tanzania National Roads Agency
P.O Box 11364
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3rd Floor, 10 Shaaban Robert Street/Garden Avenue Junction,
P. O. BOX 11364, Dar es Salaam Tanzania
Tel: +255 222 926 001 – 6, Fax: +255 222 926 011
Email: tanroadshq@tanroads.go.tz
Website: www.tanroads.go.tz
The website of Tanzania Parliament. www.Parliament.go.tz
Development Partners/ Donors websites**.**

Appendix 8: GBV Action Plan For DIST

The Dodoma Integrated Transport Project (DIST) comprises sub-projects supporting the widening/rehabilitation of trunk and regional roads that are playing a key role in the socio-economic activities of the areas. The importance of road development can be justified and linked to many aspects related to social, political and economic development through promotion of tourism attracting investments from both local and Foreign Direct Investments (FDIs),increasing the freight and passengers transport quality (level of service) and capacity, economic growth through unlocking of trade routes allowing an increase in the capacity of the existing project line and reducing travel time for passengers and goods, promote agricultural products as well as livestock products from productive area and employment generation as well as improvement of accessibility to different regions. However, large infrastructure development may increase or create risks of Sexual Harassment (SH), Sexual Abuse and Exploitations (SEA), and other types of Gender-Based Violence (GBV), related but not limited to the influx of workers to such projects.

TANROADS engaged the services of a Consultant to prepare a GBV Action Plan in accordance with the World Bank's requirements under the Environmental and Social Framework (ESF). This GBV Action Plan details the operational measures that TANROADS shall be put in place to identify, assess, and mitigate the risks of GBV, including managing SEA and SH that are Project related.

Scale of civil works.

Widening of road shall involve large civil works and require a large labor force and associated goods and services that may not be available locally. The scale of civil works shall range from pre-construction (mobilization), Construction,Demobilization and operation phases. A large number of workers shall be employed by contractors during widening/rehabilitation and each contractor and subcontractors shall determine the actual number of workers needed. The Project expected workers shall include skilled, semi-skilled and unskilled labor; the Project Labor Management Plan (LMP) estimates that the Project shall need to engage 2,000 workers in total. Mostly the unskilled labor shall be sourced from local communities along/around the project areas.

Gender-Based Violence-GBV.

GBV may be exacerbated by proposed civil works under this project. Four broad categories of GBV that may be exacerbated construction works include Sexual Exploitation and Abuse, Workplace Sexual Harassment, Human Trafficking and Non-SEA i.e. intimate partner violence, physical assault, psychological or physical abuse, and, denial of resources, opportunities or services. However, SEA and workplace SH are the types of GBV most likely to occur on Infrustructure related project. These risks increase in settings where incidents of violence against women and girls and violence against children are normalized and/or committed with impunity, and where survivors are unlikely to seek assistance due to social stigma, retaliation, or other security issues.

Elaborating the Gender Based Violence and Sexual Exploitation and Abuse concepts

Gender Based Violence (GBV) is an umbrella term for any harmful act that is perpetrated against a person's shall and that is based on socially ascribed (i.e. gender) differences between males and females. It includes acts that inflict physical, sexual or economic, psychological/emotional abuse/violence including threats of such acts, coercion, and harmful practices occurring between individuals, within families and in the community at large. These include sexual violence, domestic or intimate partner violence, trafficking, forced and/or early marriages and other traditional practices that cause harm. These acts can occur in public or in private. Women and girls are affected disproportionately by GBV across the globe.

a. ***Sexual exploitation*** refers to any actual or attempted abuse of a position of vulnerability, differential power or trust for sexual purposes, including but not limited to, profiting monetarily, socially or politically from the sexual exploitation of another person.
b. ***Sexual abuse*** on the other hand is "the actual or threatened physical intrusion of a sexual nature, whether by force or under unequal or coercive conditions." Sexual Exploitation and Abuse (SEA) is therefore a form of gender-based violence and generally refers to acts perpetrated against beneficiaries of a project by staff, contractors, consultants, workers and Partners.
c. ***Sexual Harassment (SH)*** occurs between personnel/ staff and involves any unwelcome sexual advance or unwanted verbal or physical conduct of a sexual nature. SEA/SH are therefore a subset of GBV and represent the primary focus of the grievance mechanisms presented here.
d. ***SEA versus SH***: SEA occurs against a beneficiary or member of the community. SH occurs between personnel/staff and involves any unwelcome sexual advance or unwanted verbal or physical conduct of a sexual nature. The distinction between the two is important so that agency policies and staff training can include specific instructions on the procedures to report each.

The World Bank Good Practice Note[1] defines four key types of GBV that construction projects may exacerbate:

a) SEA -exploitation of a vulnerable position, use of differential power for sexual purpose; actual or threatened sexual physical intrusion;
b) Workplace sexual harassment - unwanted sexual advances; requests for sexual favors, sexual physical contact;
c) Human trafficking -sexual slavery, coerced transactional sex, illegal transnational people movement; and
d) Non-SEA -physical assault, psychological or physical abuse, denial of resources, opportunities, or services and IPV.

The most likely violations to occur along roads project are SEA and SH.

Gender-based violence (GBV) service provider: An organization offering specific services for GBV survivors, such as health services, psychosocial support, shelter, legal aid, safety/security services.

1 WB 2018, page 3.

Potential perpetrators of SEA/SH can be any personnel associated with the project and may include not only construction workers, but also consultants and project staff supervising the civil works or undertaking technical assistance activities or studies, or the security guards hired to protect a project site.

Males and females can experience SEA and SH. However, women and girls are at a higher risk of these forms of violence based on gender discriminatory attitudes, norms and practices that contribute to sexual violence, abuse and harassment of females by males globally. When occurring to women and girls, these acts fall under the umbrella of 'gender-based violence,' defined in detail below. Nevertheless, all projects must anticipate and address the heightened risks for women and girls to SEA and SH.

GBV PROJECT RISKS

GBV is a risk for any project that interfaces with a community. However, risks increase in settings where incidents of violence against women and girls are normalized and/or committed with impunity, and where survivors are unlikely to seek assistance due to social stigma, retaliation, or other security issues. It is therefore essential for projects to take into consideration both contextual risks such as high levels of poverty, high prevalence of violence against women and girls (intimate partner violence, child marriage, harmful cultural practices) and gender biased social cultural norms, and project related risks such as high labor influx, male dominated labor force interacting to exacerbate or create the risk of SEA/SH and other types of GBV. If not well managed, these factors can lead to harm, and further marginalization and abuse of women, girls and children who are already vulnerable.

Contextual GBV risks in the Project Area

The prevailing cultural and social norms in the project area discriminates against women/girls and propagates male domination. Children, teens, and adults all experience emotional abuse. The acceptance of the use of violence by husbands/partners is high - whereby recent data of 2015-2016 from the DHS -indicates 58% of women and 40% of men believe that a husband is justified in beating his wife in certain circumstances.

Additionally, results from the Focus Group Discussions (FGDs) undertaken during the Environmental and Social Impact Assessment (ESIA's) study of the proposed project indicate that incidents of GBV is substantial, forced and early marriage of girls is a common cultural practice, and that women and girls do not freely participate in public consultations compared to men. School enrollment and retention rates among girls in the project regions are exceptionally low as a result of their domestic responsibilities, child marriage, teenage pregnancy, lack of money for school fees, long distances to schools, and lack of sanitation facilities and supplies among other factors heightening GBV risks. The FGDs noted that some areas had a functional referral pathway and the close working relationship between the police and Local Government Authority (LGA's) and Non-Governmental Organizations (NGOs).

SEA/SH Project Risks

While labor influx clearly increases risks, the changes in local power dynamics that can arise with a new project mean that local workers or partners of local women and girls employed by

the project may be at increased risk of becoming perpetrators of GBV. It is therefore important to consider broadly the range of potential perpetrators, combined with other contextual and project-related risks, to ensure projects integrate appropriate SEA/SH risk mitigation strategies. It is not sufficient to focus only on non-local workers that shall be employed through the project as potential perpetrators. In activities to raise awareness of GBV and service provision, violence that occurs at the hands of a variety of perpetrators should be addressed. Potential perpetrators include any personnel associated with the project not only construction workers but consultants, project staff or those offering technical assistance or even security guards hired to protect the site as well as construction materials. The risks pertaining to presence of workers camps include Exposure to Transmission of STIs/HIV/TB/ COVID-19; Crimes related to sexual abuse/rapping and exploitation; Sexual exploitation of minors and transactional sex amongst minors.

Women and older adolescent girls may be hired as domestic staff by project workers, and/or may congregate around project sites to sell food and other goods. Close proximity without appropriate supervisory and preventative measures may increase the risk of sexual exploitation by project workers of female domestic workers and vendors.

The project in exhausting local services, exerting pressure on the environment may result in increased or emergence of GBV in the context of high acceptability of violence against women and girls. The project shall involve large civil works and shall require a large labor force and associated goods and services that may not be supplied locally. Some construction workers may migrate from outside the Contractors Camp to stay in other Village/ Street around Project area and live in their homestead. Construction workers are predominantly male, and when migrating to the Project area, typically are separated from their families on the construction site for extended periods of time.

Projects with a large influx of workers, particularly in impoverished communities, may increase the likelihood of exploitive and coercive sexual relations involving sex in exchange for goods or money. This could range from project workers engaging in the local prostitution trade, and/or becoming engaged in coercive sexual relationships with community members, particularly minors. Labour influx may contribute to other forms of child violence, such as child marriage, particularly in communities where marriage to an employed man is seen as the best survival strategy for an adolescent girl.

It is therefore essential for the project to take into consideration both contextual and project-related risks of high labor influx, high levels of poverty, polygamy, harmful cultural practices and social-cultural norms, high prevalence of violence against women and girls in the context of project areas interacting to exacerbate or create the risk of GBV/SEA/SH. If not well managed, these factors can lead to further marginalization and abuse of women, girls and children who are already vulnerable.

LOCAL INSTITUTIONAL, POLICY AND REGULATIONS FOR SAFETY OF WOMEN AND GIRLS.

Referral Pathways

A referral pathway outlines the various multi-sectoral support and referral services for a survivor and aims at improving the quality and timelines of care received.

Referral pathway guidelines for GBV survivors in Tanzania were established in collaboration with agencies and service providers like Ministry of Health, Community Development, the Elderly, Children and Gender (MoHCGE) Local Government Authority (LGAs) (District/Municipal level, Ward level and Village/Mtaa), Police Gender and Children's Desk, traditional/religious/ influential community leaders, psychosocial service providers ,), Ward health committees, Ward Social welfare officer, WEO, VEO,VC NGOs, CSOs, CBOs) Legal Aid clinics and the courts of law which work to ensure that survivors freely and safely navigate and benefit from well-coordinated services. They are outlined in the National Plan Towards Ending Violence Against Women and Children of year 2022.

National Policy Guidelines for Prevention and Response to GBV: The Policy Guideline provides a framework for the delivery of health services to all in need, including GBV survivors. The objectives of the Policy Guideline are to strengthen efforts of the MOHSW to prevent and respond to GBV and to direct the health sector to establish effective linkages with the community and multispectral actors. It outlines the roles and responsibilities of the MOHSW and key partners in the provision of quality services to GBV survivors by integrating them into the existing national health delivery infrastructure—guided by principles of respect for human rights, professional ethics, and compassion.

This Guideline was instrumental to the development of the **National Management Guidelines for the Health Sector Prevention and Response to GBV.** They are based on the National Policy Guideline for Prevention and Response to GBV. The guidelines provide a framework for medical management, referral for psychosocial care, advice for integrating GBV services into existing health services, the linkage between health facilities and local communities, and support and linkages to social and legal protection systems. The guidelines also provide guidance on GBV monitoring and evaluation and quality assurance; consent and GBV medical forms; Police Form Three (PF3); GBV Register; laboratory investigation for GBV and preventive treatments; and GBV indicators.

On its side, the MoHSW of Tanzania in its Guidelines for the Health Sector defines the term 'GBV' to as follows: A term of any act, omission, or conduct that is perpetrated against a person's shall and that is based on socially ascribed differences (gender) between males and females. In this context, GBV includes but is not limited to sexual violence, physical violence and harmful traditional practices, and economic and social violence. The term refers to violence that targets individuals or groups on the basis of their being female or male. The term 'violence against women means any act of gender-based violence that results in, or is likely to result in, physical, sexual or psychological harm or suffering to women, including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or in private life.

Following the mapping of services, TANROADS shall identify GBV service providers with capacity and establish a multisectoral referral pathway in project sites modeling and operating as per the guidelines. The mapping out and review capacity and quality of GBV Service Providers in the project area shall be undertaken in the first quarter after signing of the contract as outlined in this Action Plan. The IA GBV Specialist shall collaborate with service providers and establish referral protocols for how survivors shall be supported to access services in a timely and safe manner according to their needs and wishes.

Type of Support Services for Survivors

GBV is a complex issue and a survivor requires multi sector services and care to heal and recover. The services include;

Medical/Health Care Services, these are interventions to address physical and reproductive health consequences and injuries resulting from GBV incidents. This includes Post Violence Care (PVC) within 72hrs, Provision of Post Exposure Prophylaxis (PEP) and Emergency Contraception (EC) within 120hrs.

Mental Health and Psycho-Social Support, these include interventions supporting the mental health of survivors of GBV Survivors are supported with services to enable them to recover from the emotional, psychosocial, and social effects of GBV. Survivors are provided Psychological First Aid (PFA) to gain the necessary stability for informed decision-making. Survivors may also need psychological counselling from trained persons to overcome stress, trauma, and depression. Social worker's/case workers may accompany them to other services in the referral pathways with the consent of survivors.

Security Services this includes the involvement of law enforces to facilitate access to justice. Survivors report cases to the police, are provided with a reporting number, and investigating officers process court files with statements, evidence among others.

Provision of Legal Assistance services that can promote or help survivors to know their rights, claim their legal rights and make informed decisions with respect to seeking justice. Legal aid is most often accessed through private NGOs and is discussed under the civil society subsection below. The WRC is a dispute resolution body and is considered to be the most locally accessible tier in Tanzania's court system.

Safe houses/shelters are places that provide immediate security, temporary refuge, and support to survivors and their families in imminent danger who are escaping violent or abusive situations or are at risk of further violence and who wish to be protected through safe shelters, police or Violence Response Teams (VRTs), community security and relocation. The shelters should be staffed by professionals and their location should be confidential.

One Stop Centers give access to holistic services to survivors. They include health, psychosocial support, legal and police services under one roof and free of charge. Where they cannot be provided under one roof, there can be a coordinated multisectoral approach with identified partners providing specific services in a coordinated manner. One such center is found in Iringa which is one of the project sites.

The Gender and Children's Desks established by the Tanzania Police Force at police stations to offer "woman-friendly" services. Gender and Children's Desks, staffed by male and female police officers, provide private locations for discussing sensitive matters—including GBV—and officers frequently offer escort services (for example, to the hospital), represent survivors in court, and may also provide temporary shelter at the police station. They are minimum guidelines for the establishment of Gender and Children's Desk to assure responsiveness to survivors as well as uniformity of service across the country as well as Standard Operating Procedures (SOPs) for the prevention and response of gender-based violence and child abuse. As at January 2021, 400 Gender and Children's Desks have been established.

Overall, there are opportunities for linkages with the community through survivor's family members; community leaders; and community individuals and organizations such as Community Health Workers, community-based distributors, Traditional Birth Attendants, community-based organizations, and faith-based organizations. Health facility management teams shall work closely with community representatives through dispensary, health center, and hospital governing committees at all levels. These shall include other committees focused on HIV/AIDS, social services and security. HealthCare providers at all levels shall inform the community and survivors on where to access services, including safe houses, drop-in centers, dispensaries, health centers, and hospitals; and shall implement outreach activities.

TANROADS shall undertake a mapping of service providers across the project sites and shall schedule regular consultations with them. TANROADS shall work to ensure that through this mapping an effective referral pathway is established. The consultations shall be for purposes of assuring their effectiveness. They shall also inform gaps and challenges that may hinder quality survivor centered services and support and help identify where they are inadequately resourced e.g. rape kits at the health care facility or gender and children police desks.
TANROADS anticipates that the support services shall include amongst others:

a. Provision for accessible information on services available to survivors of GBV/SEA/SH;
b. Provision of accessible, effective, and responsive health, social welfare, police, prosecutorial, and other services to redress cases of GBV/SEA/SH;
c. Provision of specialized facilities, like women safe spaces for survivors of GBV/SEA/SH; and
d. Provision of effective rehabilitation and reintegration programs for perpetrators of GBV/SEA/SH.

Relevant Statutory and Other Laws of Tanzania

Apart from existing referral pathways mechanism Tanzania also have National laws and regulations that address GBV, SEA and workplace Sexual harassment such as; Constitution of Tanzania of 1977 amended in 2001 article 13 (sub 6(e), Marriage Act 1971 Revised 2002, The Sexual Offenses Special Provisions Act (SOSPA Act 1998), The law of the child Act 2009, National Management guideline for the health sector response to and prevention of

gender Based Violence 2011, The Employment and Labour Relations Act 2004. and the National Plan of Action to End Violence Against Women and Children of 2022.

Article 13 of the Constitution of the United Republic of Tanzania of 1977 prohibits discrimination on the basis of gender among other things. Articles 12 to 29 incorporate the Bill of Rights and Duties, which set out the basic rights and duties of citizens which are broad enough to assert and protect rights holders against GBV. Every citizen has a duty to respect women's rights. Other rights under the said Bill of Rights and Duties include the right to equality before the law; the right to life; the right to personal freedom; and the right to privacy and personal security. It is clear that GBV falls within the ambit of constitutional protections though not in a more explicit way.

Public Health Act 2009 provide for the promotion, preservation and maintenance of public health with the view to ensuring the provision of comprehensive, functional and sustainable public health services to the general public and to provide for other related matters. Section 54 of this law states that " A person shall not cause or suffer from nuisance, likely to be injurious or dangerous to health, existing on land, premises, air or water". Therefore, TANROADS shall develop this project so that nobody suffers from nuisance or causes danger to people's lives.

Occupation Safety and Health Act (2003) The law requires employers to provide a good working environment to workers in order to safeguard their health. The employers need to perform medical examinations to determine fitness before engaging employees. Employers must also ensure that the equipment used by employees is safe and shall also provide proper working gear as appropriate. TANROADS and contractor shall observe this law during construction.

Employment and Labour Relations Act Nº. 6 0f 2004 The Act makes provisions for core labour rights; establishes basic employment standards as well as prohibiting discrimination on the basis of sex or gender role, provides a framework for collective bargaining; and provides for the prevention and settlement of disputes. Section 7 prohibits direct and indirect discrimination in the workplace including on the basis of sex, gender, pregnancy, marital status, disability, HIV/AIDS and age. Sexual harassment is also prohibited as articulated in Section 7(5). TANROADS shall ensure the Contractor adheres to employment standards as provided for by the law.

The Penal Code (revised 2002) criminalizes various GBV offences through the 1998 Miscellaneous Amendments also known as the Sexual Offences Special Provisions Act (SOSPA). The SOSPA made special provisions concerning sexual and other offences and widened the offences to include trafficking in persons, sexual harassment and FGM. The SOSPA introduced stiff penalties for sexual offences: the imposition of a minimum sentence of 30 years, imprisonment and compensation to a survivor of violence and life imprisonment for offenses committed against a child less than 10 years; life imprisonment for the crime of gang rape; no less than 10 years imprisonment for gross indecency; 5 to 20-year imprisonment for sexual exploitation of children and grave sexual abuse with a punishment

of imprisonment between 15 to 30 years and in cases where the survivor is less than 15 years, imprisonment from 20 to 30 years

TANROADS shall work to ensure that all its contractors, consultants and/or other project related individuals adhere to and comply with laws and shall invest time to create awareness on the importance of assuring safe and secure project implementation for all.

TANROADs Safeguard Instruments on Addressing GBV/SEA/SH

TANROADS has developed several Safeguard instruments such as Environmental and Social Framework 2018, Contactors Environmental, Social, Health and Safety requirements (ESHS), as well as HIV/AIDS Policy 2018, which guide Contractors to prepare Safeguards tools such Specific Occupation Health and Safety Plan, HIV/AIDS, Sexual Transmitted Disease (STDs), Tuberculosis (TB), Coronavirus Disease (COVID–19) Specific Environmental and Social Management Plan (ESMPs) and Health and Social Management Plan (HSMPs), Contractors Labor Management Strategy, Specific GBV/SEA strategy that protects workers and community members against SEA, sexual harassment, gender based violence, child abuse, recruitment and anti-retaliation as well as ensure the protection of people and communities working with, including mechanisms to limit, report and respond to potential cases of sexual exploitation, abuse and sexual harassment cases. These tools form parts of bidding requirements to Contractors during tendering. This would highlight what is in place and the gaps and in an operational way inform the contractors and supervising consultants to address the GBV risks.

Workers Code of Conduct

TANROADS has a Code of Conduct that provides a framework of cooperation in response to SEA/SH survivors' support and incident notification. TANROADS existing CoC is part of contractor procurement and they shall commit to have all workers sign the CoC which is the standard version from WB. Prior to project Implementation the Contractor has to adopt the standard CoC from TANROADS to be signed by all project workers. Also, the Contractor shall have to review available plans, strategies and regulations that address GBV, SEA and SH at workplace in order to update accordingly. The Contractor would be required to operationalize this action plan by implementing the required actions. This would in an operational way assist the contractors and supervising consultants to address the same.

Code of conducts shall provide a set of standards for behavior that staff, consultants, contractors, incentive workers, volunteers of an organization are obliged to adhere to**.** It is mandatory for all contractors/consultants/etc to ensure all workers sign a Code of Conduct (CoC) prepared by TANROADS which is the standard version from WB. The CoC to be used during worker's recruitment specifies appropriate behavioral conduct, responsibility and penalties for non-compliance of rights, SEA/SH other social misconducts. The CoC prohibit sexual relations with minors (under 18 years of age, subordinates, vulnerable groups, and protects them against various forms of sexual harassment in the work place. The CoC shall also highlight the sanctions that shall be taken against project workers for violation of SEA/SH. It shall show where SEA/SH grievances shall be reported. The CoC shall be translated into languages that are understood by the workers. Project workers shall be

sensitized on the CoC and communities shall be made aware of the CoC provisions during public sensitizations.

Establishment of a Reporting Mechanism

TANROADS shall develop and put in place a reporting mechanism with multiple channels to facilitate confidential logging in of GBV/SEA/SH complaints in all the project locations. TANROADS shall recruit a GBV Specialist to assist the GBV/SEA implementation. The GBV Specialist shall develop SEA/SH reporting procedure that shall guide survivors to report and PIT to respond. It shall be necessary to identify and integrate GBV/SEA/SH entry points within the GM with clear procedures and tools for safe, confidential, and ethical management of related complaints. It (reporting procedure) shall provide for timely and safe reporting of SEA/SH incidences including the mandatory requirement of notifying the WB of an incident that occurs within 24hours of knowing about it. The procedure shall be guided by a survivor centric approach outlining professional standards and work ethics for the protection of women and children, including confidentiality, non-discrimination, respect, consent, safety and also outlining the responsibilities of the key actors in addressing the incident including supporting the survivor.

GRIEVANCE REDRESS MECHANISM

GRM for GBV/SEA involves a formal process for receiving, evaluating and redressing Project-related grievances from affected communities, workers and the public. The DIST recognizes vulnerability of the different Project participants involved or affected by the Project activities (such as community members, workers and other beneficiaries).

To address GBV risks appropriately, the **GRM needs to be in place prior to contractors mobilizing.** TANROADS has developed GRM for GBV/SEA which have to be implemented along the road. It is required that, the borrower shall have a grievance mechanism that shall be "proportionate to the potential risks and impacts of the project". This is meant to apply to all aspects of the project including when addressing GBV or both SEA and SH survivors, there are risks of stigmatization, rejection, and reprisals against survivors. To enable community members and staff persons to safely access the GRM, multiple channels shall be provided through which survivors can be registered in a safe and confidential manner shall be enabled.The Mechanism shall be disclosed through training, sensitization/ awareness meetings that are accessible for different groups and during times and in places where everyone can participate; stakeholder engagement; World Bank & TANROADS websites; TANROADS Regional offices; Direct to stakeholders through formal letters, phone numbers, radio, e-mail and WhatsApp groups; Community informer; VGs focal persons; Public Address System; Visual displays in public places such as market & business centers, village/ward offices, worship areas, schools etc. Brochures/leaflets, posters; Social media and Non-technical summary of documents and reports.

GBV/SEA GRM Principles

The GRM for GBV/SEA/SH and VAC cases shall be based on the following principles:

a. The process shall be transparent and allow workers/community to express their concerns and file grievances;
b. Anonymous grievances shall be treated equally as other grievances, whose origin is known;
c. Grievances shall be treated confidentially, except anonymous ones;
d. Workers/community shall be informed of how their grievances are resolved;
e. Multiple/accessible channels through which SEA/SH complaints can be registered shall be established.

Others principles specific to addressing GBV include;

Confidentiality and anonymity

a. Grievances shall be treated confidentially, except anonymous ones;
b. Separate logging in SEA/SH cases from other cases.
c. No identifiable information of SEA/SH cases in the GRM logbook
d. Separate coding system for names should be created and stored in a locked cabinet in the officers of GRM levels. The complaint logbook should also be stored in a different locked cabinet.
e. No identifiable information on the survivor should be stored in the GRM

Survivor Safety

Feedback on the case is provided to the survivor only and strong caution is exercised before communicating any results beyond the survivor.

Put in place Info sharing procedure to ensure that only those having a role to play in the response to an allegation (i.e. GBV service providers) receive case level information.

The GRM should record information on not more than three aspects related to the GBV incidents: (a) the nature of the complaint (what the complainant says in her/his own words without direct questioning, (b) if, to the best of their knowledge, the perpetrator was associated with the project, and if, possible, (c) the age and sex of the survivors.

Survivor centricity

a. Process to seek survivor's informed consent is in place throughout the GRM process.
b. There shall be no discrimination against those who express grievances;
c. Management shall treat grievances seriously and take timely and appropriate action in response.
d. All those handling SEA/SH complaints in the GRM must be trained on SEA/SH and survivor centred approaches

Information about the existence of the grievance mechanism shall be readily available to all project workers/community (direct and contracted) through notice boards, public offices such as WEO, VEO and community centres, "suggestion/complaint boxes", and other means such Mobile phone, walk –ins as needed.

GBV-GRM Levels

	Levels	Responsible Persons/Department	Role
	Project Committee	The committee at project level shall consist of PIT Members (Project Engineer, Sociologist (Chairperson), WEO, Supervising Engineer (RE), Contractor (PM), -Legal officer, Land officer, GBV Specialist, HRO and Local NGOs/ CBOs).	• Project Committee shall maintain records related to GBV grievances following ethical and safety procedures as outlined in the GBV Action Plan. • Monitor the status and effective referral of GBV/SEA/SH complaints • Notify the WB of any project related SEA/SH incident in a timely manner • Establish TOR's for a SEA/SH Committee that shall be responsible for the investigation/verification of SEA/SH incidents reported and give recommendations to the alleged perpetrators employer for action.
	GBV Specialist	GBV Specialist shall work closely with GBV service providers identified in the Project areas.	• Register grievances • Filing grievances • Provide psychological first aid to survivor and refer survivor to services • Notifying the designated GBV focal point in the Project GRC of the allegation in line with pre-established information-sharing protocols • Provide feedback to survivors • Be part of the SEA/SH committee set up by the PIT that shall establish if the alleged perpetrator is a project worker, if there is a breach of CoC, recommend to the employer sanctions/actions to be taken.

Standard Operating Procedures

Access to the GBV GRM

Information about the existence of the grievance mechanism shall be readily available to all project workers/community (direct and contracted) through notice boards, public offices such as WEO, VEO and community centres, suggestion/complaint boxes, and other means such mobile phone, walk–ins as needed.

TANROADS shall put in place the necessary mechanisms to address SEA/SH. The proposed mitigation measures as per the risk level in the current project is as follows:

a. Define GBV requirements and expectations included in the contractual obligations as well as reinforce CoCs that address GBV/SEA/SH in the project locations to cultivate an environment free from GBV and SEA/SH as well as regular dissemination of the CoC to the workers;
b. Develop and elaborate the roles of the GRM committees in addressing GBV and SEA at the different levels; ward, village and project for effective management of complaints.

c. Develop criteria for selection of the focal person for GBV/SEA at each level – ward, village and/or project and the terms of reference
d. Ensure a GBV specialist is in place to support SEA/SH risk management measures in TANROADS;
e. Develop and deliver information, education, and communication (IEC) materials for stakeholders to indicate that the project and/area is a GBV/SEA/SH free zone, as well as provide information on GBV response services (such as hotline numbers and where to seek assistance when needed). Other information to be highlighted include:
    - No sexual or other favours can be requested in exchange for services;
    - Project staff including contractors and subcontractors are prohibited from engaging in SEA/SH and this information should be clearly spelt out during training and other forms of communication to the staff;
    - Any case or suspicion of SEA/SH should be reported to [hotline number, GM or citizen engagement/feedback mechanism];
    - Information on protection of whistle-blowers; and
    - The range of services available for survivors including healthcare, protection and psychosocial care – the referral pathway for the project.
f. Identify and map GBV service providers to ensure information is made available to health service providers on where psychosocial support and emergency medical services for survivors of GBV can be accessed (within the healthcare system);
g. Develop SEA/SH prevention policy and response procedures that outline key requirements for reporting cases if they arise, measures to enable safe, ethical, survivor-cantered response and disciplinary processes;
h. Train all project staff contractors, subcontractors and workers and integrate understanding of the CoC, GBV, SEA/SH as well as accountability and response framework including the referral processes, responsibilities and reporting in other trainings; and
i. Utilizing the GM developed under the project with a separate channel to manage GBV-related complaints at the community and organization levels to enable reporting in a safe, confidential survivor-centric manner. The project GM shall ensure all incidents of GBV/SEA/SH reported either through the general GM system that is related to the new project are relayed to the PIT and WB within 24 hours.

TANROADS PIT

PIT shall be responsible for oversight of grievance handling across all subproject sites, and shall carefully monitor the status and effective referral of GBV/SEA/SH complaints. The GBV Specialist shall be hired during the first quarter after signing of the contract by the TANROADS and GBV Specialist shall be included in PIT. PIT shall be responsible for the Supervision and monitoring of GRM Committees for GBV/SEA cases at all levels and reporting on GRM implementation in a monthly basis. GBV focal point persons shall be identified based on a set criterion from the GRM Committees to provide follow up support to survivors, refer them to services and to the GBV Specialist for registration of incidents and follow up on accountability procedures according to their wishes. Other GRM committee

members shall refer survivors to the focal point person and to services. GRM Committees shall be trained on survivor centred approaches, GBV/SEA GRM and reporting protocols.

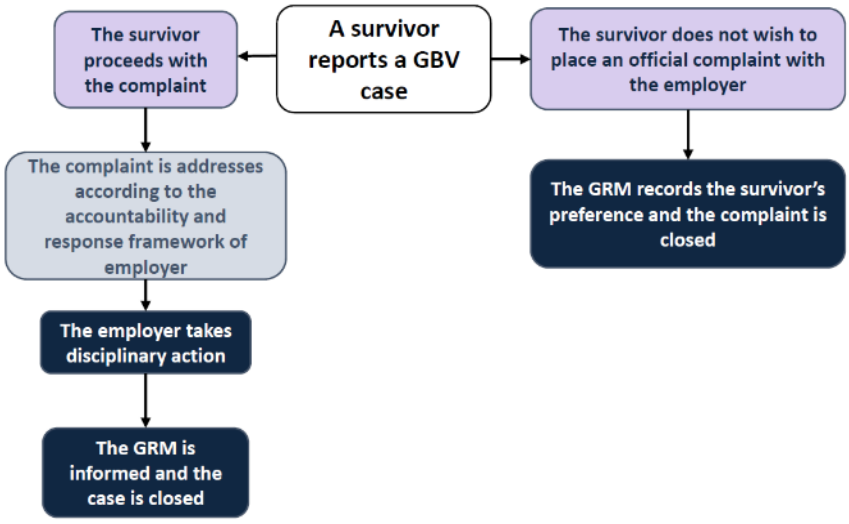
The grievances related to project impact, violation of labour rights as well as GBV/SEA/SH shall form a substantial part of the staff induction training and awareness to all project workers/community, worker's shall be sensitized on Codes of Conduct for their acceptance and signature. The contractor shall be required to demonstrate proof that each employee has signed the Code of Conduct and has been inducted on the GRM procedure. Furthermore, as part of the contractor's human resources policies, there should be a project workers GRM/procedure for women workers involved in public works to report cases of sexual harassment and procedures to address these kinds of cases.

Grievance Committees, contractors and subcontractors

For grievances registered with grievance committees, contractors and subcontractors, they shall be responsible for keeping records and reporting cases to PIT. During the setup of the GRM in each institution, the recording of SEA/SH grievances should include:

a. Nature of complaint;
b. The date that the complaint was logged;
c. Location where the complaint is related to;
d. Any follow up actions taken to support the survivor;
e. Outcome of verification/investigation of incident;
f. Corrective actions taken to avoid the recurrence of similar grievances in the future, if applicable.

Employers generic Code of Conduct stipulates the contractor's requirements to deal with GBV. Figure below shows stepwise procedure for management of GBV cases. The first level GRM has been replaced with the nominated GBV focal person.



Stepwise procedure for management of GBV cases

PIT's CAPACITY TO PREVENT AND RESPOND TO GBV RISKS

Conduct Staff Assessments

Prior to implementing sensitization and training, it is useful to conduct staff knowledge, attitudes, and practice assessments to determine the level, scope and type of sensitization and training that shall need to be conducted by GBV/SEA Specialist for different staff members of PIT, Contractors and Consultants. In addition, this information can be used to documents a baseline so that proposed projects can measure changes in providers' knowledge, attitudes, and practices over time. The staff assessment should cover:

a) Personal perceptions, attitudes and beliefs related to violence against women and girls
b) Knowledge of gender issues and human rights
c) Knowledge of SEA and SH issues
d) Knowledge of CoC, SEA/SH reporting channels, available services/referral pathway
e) Understanding of the legal framework, national policies and protocols focusing on SEA/SH and VAC

Technical skills related to addressing violence against women and girls

Strategy of Conducting Staff Training and Sensitization

In general, the training should consider the following key activities to build staff capacity:

a. Contractors and Consultant staff from project site to service providers should first sensitized about issues related to SEA/SH.
b. Evidence suggests that civil professionals are likely as any other members of society to hold views informed by the socialization and which may be detrimental to the welfare of survivors, such as blaming the GBV survivor. Staff also need to have a basic understanding of the nature and scope of violence against women and girls, the dynamics of abuse, risk factors and consequences as well as importance of upholding rights to security and protection of women and girls and ultimately all members of society.
c. Specialized staff, including all civil professional providing direct services to survivors, should receive additional and ongoing training on key elements related to intake, examination, record keeping, etc.

Specialized staff should also receive ongoing support to manage the challenges of working with survivors, through supervision, in-service trainings, case reviews, etc.

Provide Staff Training and Sensitization on SEA/SH

After reviewing the outcomes of the staff assessments, facilities can determine how best to offer sensitization and training that is focused on SEA and SH issues. The staff to be trained shall include the PIT members whose, (Sociologist-GBV/SEA specialist, Environmentalist, Land officer, Legal expert, Labor expert, Community Development Officer, Project Engineers, RE, Project manager, WEO, VEO and Health and Safety Officer who shall be responsible for coordinating, proving guidance and follow up operation of GBV/SEA mechanism and implementation. Among others, the PIT in collaboration with GBV specialist shall continue to build up the capacity to Contractors and Consultant staff/workers as well as communities along/around the project areas as the cornerstone of any facility's ability to address violence against Accountability and response framework

Such as: -

a) Responsibilities and reporting
b) Confidentiality and whistle blower protection clauses
c) Identification of SEA/SH risk factors
d) Impacts of SEA/SH
e) Referral procedure
f) GBV/SEA related issues
g) Staff Management
h) Recording of grievances
i) Reporting ethics
j) Survivor centricity and consent
k) Data storage and confidentiality.

In a bid to sustain GBV/SEA knowledge and skills throughout the project, TANROADS commits to:

a) Holding intensive training workshops for staff with the help of outside experts or institutions;
b) A supervising consultants and contractors so as to assure GBV/SEA free environment is promoted.
c) Arranging for ongoing training and support from individuals or organizations with specific expertise in areas such as psychology or law;
d) Distributing written educational information to providers on a regular basis;
e) Incorporating the issue of violence against women and girls into other training workshops for road project

Implementation of the Action Plan

This Action Plan shall be implemented and monitored by PIT at Project level. TANROADS shall also be responsible to ensure all required safeguards specialists are in place as per Contractor and \consultant contract before the project civil works commence.

A Survivor-Centered Approach

The Surviror-Centred Approach is the best practice recognizes that it is essential to respond appropriately to a survivor's complaint by respecting the survivor's choices. This means that the survivor's rights, needs and wishes are prioritized in every decision related to the incident. The survivor of SEA/SH, who has the courage to come forward, must always be treated with dignity and respect. Every effort should be made to protect the safety and wellbeing of the survivor and any action should always be taken with the survivor's consent. These steps serve to minimize the potential for re-traumatization and further violence against the survivor. Confidentiality is essential throughout the process. Otherwise, the survivor risks retaliation and a loss of security.

If the alleged perpetrator is an employee of the contractor, consultant or Implementing Agency (IA), to protect the safety of the survivor, and the workplace in general, the IA, contractor or consultant should assess the risk of ongoing abuse to the survivor and in the workplace. This should be done in consultation with the survivor and with the support of the

GBV service provider. Reasonable adjustments should be made to the alleged perpetrator's or survivor's work schedule and work environment -preferably by moving the perpetrator rather than the survivor -as deemed necessary. The employer should provide adequate leave to survivors seeking services after experiencing violence.

ACTION PLAN

This section details the specific measures for mitigating SEA/SH risks under the Dodoma Integration Transport Project (DIST). These include the mitigation measures already in place as well as steps to undertaken to further mitigate and respond to risks and cases of GBV/SEA in the project sites.

Indicative budget for SEA/SH Action Plan activities

	Activity to Address SEA/SH risk	*Steps to be taken*	*Time Lines*	*Responsible*	*Monitoring (Who shall monitor)*	*Output indicators*	*Estimated Budgets (TSHS)*
1	***Sensitize the communities, workers, local leaders, Trainer of the trainees, PIT members, contractor and consultant on the importance of addressing SEA/SH on the project, and the mechanisms that shall be implemented***						
a.	Training to PIT-members, NGOs, CBOs Contractor and Consultant Staff, Trainer of Trainees on SEA/SH to include School Otreach, Community and NGOs shall be trained and provided training material as per availability of resources a. Accountability and response framework b. Responsibilities and reporting c. Confidentiality and whistle blower protection clauses d. SEA/SH, causes, risk factors e. Impacts of SEA/SH f. Referral pathway/services available g. SEA/SH GRM	a. Secure GBV/SEA training expert, b. Prepare the training modules and materials. c. Conduct training for targeted members. d. Arrange date and venue for training to be undertaken. e. Include SEA/SH as an agenda in quarterly meetings. f. Invitation of experts. g. Preparation training material	Quarter-1 following signing of the works contract Quarterly (Throughout Project implementation.)	GBV/SEA expert, PIT, TANROADS Project Staff, Contractor and Consultant staff	PIT/ TANROADS	Number of training conducted to PIT-members, workers, communities, vulnerable groups and local leaders and reports produces)	20,000,000

	h. SEA/SH grievance handling i. Boundaries of reporting j. Survivor centered approach k. Data storage, sharing and confidentiality (Information sharing protocol ISP).	h. Dissemination material. i. Invitation of NGOs, CBOs representatives j. Selection of trainer of trainee's sensitization of project workers k. Selection of trainer of trainee's sensitization of the community l. Invitation of community leaders. m. School Outreach					
b)	Training to community, Schools, vulnerable groups and local leaders) on SEA/SH to include: a. on SEA/SH. b. Responsibilities of a given community, Vulnerable group and Local leaders on SEA/SH. c. SEA/SH, causes, risk factors.	a. Secure technical expertise, b. Prepare the training module and materials c. Conduct training for targeted members d. Include SEA/SH as an	Quarter-1 following signing of the works contract Quarterly (Throughout Project implementation.)	communities, vulnerable groups and local leaders)	PIT/ TANROADS	Number of training conducted to PIT-members, workers, contractor's communities, vulnerable groups and local leaders and reports produces)	Covered in BOQ

	d. Impacts of SEA/SH. e. SEA/SH grievance handling procedure. f. Boundaries of reporting. g. Survivor centered approaches. h. Referral pathway/available services. i. GRM & reporting protocol	agenda in quarterly meetings e. Arrange public meeting f. Develop School outreach g. Mapping h. Use of Stakeholder Engagement Strategy to include Women and Girls i. Introduction of group discussion j. Invitation of NGOs, CBOs and					
c)	Contractor and Consultant Management trained on SEA/SH a. Responsibilities of a given Contractor and Consultant on SEA/SH Action Plan implementation/monitoring b. SEA/SH causes and risk factors c. Impacts of SEA/SH	a. Prepare the training module and materials b. Conduct training for targeted members c. Arrange date and venue for training to be undertaken d. Include	Quarter 1 following signing of the works contract Quarterly (Throughout Project implementation.)	GBV/SEA expert, PIT, TANROADS Project Staff, Contractor and Consultant staff	PIT/ TANROADS	Number of training conducted to PIT-members, workers, communities, vulnerable groups and local leaders and reports produces)	10,000,000

	d. SEA/SH grievance handling procedure e. Boundaries of reporting f. Survivor centered approach g. Code of conduct h. Available services	SEA/SH as an agenda in quarterly meetings e. Selection of representative by group f. Preparation of CoC					
2	***Conduct GBV/SEA assessment at project sites***						
	Conduct a GBV risk assessment and GBV mapping in project area to inform risk mitigation strategies Conduct a GBV/SEA risk assessment to inform risk mitigation strategies	a. GBV Specialist to conduct assessment in the project area b. GBV Specialist to conduct a desk review of GBV/SEA in project area. c. GBV Specialist to conduct assessment in the project area d. GBV Specialist a desk reviews an of GBV/SEA in project area	First quarter after signing works contract together with the GBV/SEA assessment First quarter after signing works contract together with the GBV/SEA assessment.	PIT/ GBV Specialist PIT/GBV Specialist	TANROADS/ PIT TANROADS/ PIT	GBV assessment report. GBV assessment report	10,000,000
b.	Mapping out and review capacity and quality of	a. Review capacity and	First quarter after	PIT/GBV Specialist	TANROADS/ PIT	GBV service mapping and	10,000,000

	GBV service Providers in the project area	quality of GBV service providers b. Conduct field visits to identify and map out key actors and service providers on GBV/SEA in project area and collect data at the community/sub county level.	signing works contract First quarter as part of the baseline data.	LGAs.		capacity and quality assessment Report	
b.	Stakeholder consultations	a. Develop interview/ facilitation guides b. Conduct stakeholder meetings/FGDs c. Conduct regular SEA/SH safety audits d. Prepare field visit reports.	Prior to initiating construction. Maintained throughout Project implementation.	PIT/GBV Specialist LGAs.	TANROADS/ PIT	Report on stakeholder consultations Safety Audit reports	10,000,000
c.	Update a GBV referral pathway	a. PIT to undertake a review of the existing referral pathway and	Third quarter after signing works contract	PIT/GBV Specialist LGAs	TANROADS/ PIT	Referral pathway updated Report on Number/type of GBV/SEA	15,000,000

		update b. the referral pathway/list for service providers. c. Disseminate the referral pathway/list to stakeholders including service providers	Maintained throughout project implementation.			preventive and response services available. Report on No. of referrals of SEA/SH incidents to the project GRM by other service providers	
3	**Strengthen Institutional capacity for GBV/SEA risk mitigation and response**						
a.	Engage GBV/SEA Specialist in TANROADS to supervise and provide technical support for the implementation of GBV/SEA Action Plan	Procure services of a qualified and competent GBV/SEA specialist to supervise and provide technical support for the implementation of GBV/SEA in projects. TANROADS has social development specialists that have been supporting	In the first Quarter after contract signing	PIT/GBV Specialist LGAs	TANROADS/ PIT	Qualified GBV/VAC specialist hired	10,000,000

		GBV and VAC activities in aiport project and these shall support initial phases of the project before the GBV specialist is hired					
b.	Support capacity of local systems to prevent and respond to GBV/SEA (police, health, legal, CDO's, CBO's) a. Strengthen the reporting mechanisms & procedures of local systems. b. ii)Strengthen a survivor centred referral and response. c. iii)Strengthen coordination for better services with	a. Identify key stakeholders to engage b. Develop training plan c. Develop training material/ content using global/national standards, human rights and survivor centered approaches d. Conduct training and mentoring e. Conduct regular coordination meetings with service	Maintained throughout Project implementation.	PIT/GBV Specialist LGAs.	TANROADS/ PIT in coordination with LGAs, Police, specialized NGOs	Number of trainings conducted. Number of coordination meetings conducted. Level of satisfaction of GBV/SEA survivors with services received Level of Community awareness about GBV and SEA referral pathway.	10,000,000

	local/national GBV/SEA service providers.	providers for effective referrals					
4	***Integrate GBV/SEA risk management in Contractors' Environment and Social Implementation Plan (ESIP)***						
a)	Incorporate GBV/SEA risk in the Contractor's Environment and Social Implementation Plan (ESIP)	Integrate GBV/VAC considerations in the Contractor's Environment and Social Implementation Plan (ESIP)	First Quarter after signing of the works contract during project implementation.	Contractor, Supervised/ PIT/ Facilitators/Consultant	TANROADS/ PIT	Updated ESIP with GBV/VAC	Covered in BOQ
b)	Develop and establish/review SEA/GBV response and accountability framework to include: Allegation Procedures to report SEA/GBV incidents and internally for case accountability procedures which should clearly lay out confidentiality requirements for dealing with cases	a. Develop/review SEA/GBV Allegation Procedures to report SEA/SH issues b. Inform employees and the community on how to report cases of SEA/SH, CoC breaches to the GRM, and how such cases are handled c. Develop mechanisms to	Quarter 4 after signing of works contract During project implementation.	TANROADS/PIT, Project Staff; Contractors	TANROADS/ PIT	An established and functional accountability framework.	Covered in BOQ

		hold accountable alleged perpetrators; disciplinary action for violation of the CoC by workers.					
5	***Review the IA's capacity to prevent and respond to GBV/SEA***						
a)	Review for attention to GBV/SEA: a. Human resource manuals and staff capacity. b. Existing GBV/SEA Policies and procedures. c. Project code of conduct.	a. Capacity assessment of implementing agency b. Review TANROADS ESMS and procedures/Guidelines c. Review the TANROADS Referral Pathways and reporting mechanisms d. Review Project Frameworks to identify GBV/SEA policies and procedures.	During the first Quarter of Contract signing. To continue during Project Implementation.	TANROADS/PIT, Project Staff;	TANROADS/ PIT	GBV/SEA prevention and mitigation measures addressed in policy documents Establish how the referral pathway shall be strengthened.	5,000,000
b	TANROADS shall hire	Recruit/train an	In the first	TANROADS/PIT,	TANROADS/	A qualified and	Covered

)	GBV/SEA Specialist to support and supervise issues related specifically for TTIP	officer with GBV/SEA skills	Quarter after contract signing	Project Staff;	PIT	competent GBV/SEA/VAC staff recruited.	in BOQ
c)	Develop M&E programme	a. Develop a comprehensive M&E plan to monitor work and implementation. b. Monitor SEA/SH Implementation Plan	In Quarter 2 of second year after contract signing Maintained throughout Project implementation.	TANROADS/PIT, Project Staff; Facilitators/Consultant	TANROADS/ PIT	M&E framework in place .	5,000,000
d)	Conduct GBV/SEA orientation training for project staff	a. Develop a training plan b. Develop training materials c. Conduct training for project staff	Quarter 2 after contract signing Retraining during Project implementation.	TANROADS/PIT, Project Staff; Facilitators/Consultant/LGAs	TANROADS/ PIT	Number of training conducted for project staff. Percentage of workers that have attended CoC training.	Covered in BOQ
6	***Sensitize communities about GBV/SEA/SH***						
a)	Establish partnerships with CBOs/CSO's and local government institutions	a. Identify and select partners and officially inform them b. Engage partners, conducting joint community	Quarter 3 of contract signing Maintained throughout Project implementation.	TANROADS/PIT, Project Staff; LGAs Facilitators/Consultant	TANROADS/ PIT	Number of partnerships formed	Covered in BOQ

		meetings and awareness - raising					
b)	Identify and train	Establish a trained, dedicated and committed network of community focal persons	Quarter 1 of contract signing Maintained throughout Project implementation.	TANROADS/PIT, Project Staff; Facilitators/Consultant	TANROADS/ PIT	No. of focal points and persons identified and trained	Covered in BOQ
c)	Develop specific Stakeholder engagement strategy for GBV/SEA related issues	Develop a comprehensive GBV/SEA Stakeholder Strategy	Quarter 1 of contract signing. Maintained throughout Project implementation.	TANROADS/PIT, Project Staff; Contractors/Consultant	TANROADS/ PIT	Stakeholder Implementation Strategy developed	Covered in BOQ
d)	Develop information dissemination strategy	a. Develop a strategy b. Identity the methods to disseminate the information c. Disclosure of information to stakeholders through multimedia outlets	Quarter 3 of contract signing. Maintained throughout Project implementation.	TANROADS/PIT, LGAs, Contractors/Consultant	TANROADS/ PIT in coordination with LGAs	A GBV/SEA communication strategy in place	Covered in BOQ
e	Develop relevant	Develop relevant	Quarter 2 of	TANROADS/PIT,	TANROADS/	No. and type of	Covered

)	materials for community engagements	materials translated in local languages of the project location	contract signing Maintained throughout Project implementation.	LGAs, Contractors/Consultant	PIT in coordination with LGAs	GBV/SEA material developed	in BOQ
f)	Community outreach to schools on the risks of GBV/SEA	a. Develop a school outreach Plan in consultation with the School heads. b. Conduct sensitization targeting teachers, parents and students	Quarter 1 of contract signing. Maintained throughout Project implementation.	TANROADS/PIT, LGAs, Contractors/Consultant	TANROADS/ PIT in coordination with LGAs/schools	Number of school outreaches conducted	Covered in BOQ
g)	Conduct community sensitization sessions	a. Develop a Community GBV/SEA and sensitization program, material and messages b. Conduct community sensitization.	Quarter 1,2 and 3 of contract signing Maintained throughout Project implementation.	TANROADS/PIT, LGAs, Contractors/Consultant	TANROADS/ PIT in coordination with LGAs	Number of community sensitization conducted	Covered in BOQ
7	***GBV/SEA sensitive channels for reporting in GRM***						
a	Review GRM for	a. Undertake	Quarter 1	TANROADS/PIT,	TANROADS/	GRM with	Covered

)	specific GBV/SEA/SH procedures Sensitize the community and project workers on the channels available for reporting any cases of gender-based violence, sexual harassment or sexual exploitation and abuse.	internal review of GRM for GBV/SEA mitigation. b. Integrate GBV/SEA entry points within the GRM with clear procedures. c. Review the GM to ensure it meets the GBV needs that currently exist. This should create a conducive environment that is safe for the victims/survivors to report d. Guide the community and employees on the channels of reporting cases of GBV and what constitutes sexual harassment.	after signing of works contract Ongoing throughout the project implementation	LGAs, Contractors/Consultant	PIT in coordination with LGAs	GBV/SEA procedure integrated In the GRM Victims/Survivors of GBV/SEA/SH can easily reach out to report an attempt of action of violence against them and receive a supportive response immediately	in BOQ

		e. Outline for the employees the penalties and disciplinary actions that shall be taken against anyone.					
b.	Identify and train GBV/SEA/SH focal points/person within the GRC who shall be responsible GBV/SEA cases and referrals to the PIT and or other relevant stakeholders as defined in the referral pathway.	a. Identify and select GBV/SEA focal persons within the GRC b. Clarify the role of the focal points in GBV/SEA as referral points c. Train the focal points on GBV/SEA basics and the referral pathway.	During Quarter 2 following signing of the works contract. Retraining during project implementation.	TANROADS/PIT, LGAs, Contractors/Consultant	TANROADS/ PIT in coordination with LGAs	GBV focal points selected and trained	Covered in BOQ
c)	Review GRM reports/logs for GBV/SEA sensitivity	Review logs for GBV/SEA documentation to ensure it follows standards for documenting GBV/SEA cases	During project implementation.	TANROADS/PIT, LGAs/RE	TANROADS/ PIT in coordination with LGAs	Number of GBV/SEA cases documented	2,000,000

8	***Define and reinforce GBV/SEA/SH requirements in procurement processes and contracts***						
a.	Incorporate GBV/SEA/Requirements and expectations in the contractor and consultants' contracts.	Ensure that GBV/SEA issues are incorporated in all contracts signed by contractors and consultants	During project implementation.	TANROADS/PIT, LGAs/RE	TANROADS/ World Bank	GBV/SEA standards in procurement/contract document	Covered in BOQ
b.	Allocation of funds for GBV/SEA/SH related costs in procurement documents.	Clearly define SEA/SH requirements and expectations in the bid documents	During preparation of bid and Contract documents	TANROADS/PIT,	TANROADS/ World Bank	Bid documents with clearly defined SEA/SH requirements Contract documents with clearly defined SEA/SH clauses/requirements.	Covered in BOQ
c.	Workers (Contractor/consultant) sensitization on GBV/SEA.	a. Develop a training plan for workers, contractors and consultants b. Conduct training on GBV/SEA risks, responsibilities and legal/policy requirements	Quarter 2 after signing works contract During project implementation.	TANROADS/PIT, LGAs/RE	TANROADS/ PIT in coordination with LGAs	Number of contractors' and consultants staff trained,	Covered in BOQ
d	Codes of Conduct	a. Define the	Prior to	TANROADS/PIT,	TANROADS/		Covered

.	translated and signed in the local language	requirements to be included in the CoC which addresses GBV/SEA/SH. b. Review CoC for provisions/clauses that guard against GBV/SEA/SH. c. Have CoCs signed by all those with a physical presence at the project site. d. Train project-related staff on the behaviour obligations under the CoCs.	Project implementation	LGAs/RE	PIT in coordination with LGAs	Percentage of workers that have signed a CoC	in BOQ Covered in BOQ
9	***Separate toilet and shower facilities for men and women and GBV/SEA-free signage***						
a.	Provide separate facilities for men and women and display signs, posters and pamphlets around/along the project site that signal to workers and the community that the project site is an area	a. Provide separate facilities b. Design and print pamphlets and posters. c. Distribute the pamphlets and posters to the	In quarter of Contract signing During project implementation	TANROADS/PIT, LGAs/RE/ Contractor/RE	TANROADS/ PIT in coordination with LGAs	Separate toilet and shower facilities for men and women Display signs/IEC materials	Covered in BOQ

	where GBV/SEA is prohibited	project site d. Install signage on the facilities Visit Project gangs/camps to check on the availability and usability of separate sanitary facilities.					