

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT (ESIA) FOR THE
PROPOSED CONSTRUCTION OF THE STANDARD GAUGE RAILWAY LINE (SGR)
FROM UVINZA IN UVINZA DISTRICT TO KIGADYE IN KASULU DISTRICT (156KM),
KIGOMA REGION, TANZANIA**



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EXECUTIVE SUMMARY

Project Background and Rationale

The Government of the United Republic of Tanzania (GoT) through the Tanzania Railways Corporation (TRC) is continuing with the construction of the electrified Standard Gauge Railway (SGR) across the country. The SGR project is implemented in phases, which are referred to as “Lots”. Lot 1 (Dar es Salaam to Morogoro) and Lot 2 (Morogoro to Makutupora) have a total length of approximately 541 km. The SGR lot 3 (Makutupora to Tabora) has a total length of 294 km and Lot 4 (Tabora to Isaka) has a total length of 130 km. Lot 5 (Mwanza to Isaka) cover approximately 237km of the mainline. Construction for these Lots (i.e., Lot 1 up to Lot 5) is ongoing. The contract for SGR Lot 6, Tabora to Kigoma has been signed and logistics to commence work have started. Preparatory works are underway for the construction of the SGR project from Uvinza to Kigadye covering 156.4km through districts of Uvinza District Council, Kasulu Town Council, Kasulu District and Buhigwe District in the Kigoma region.

The EAC Treaty support regional integration and socio-economic development. To achieve this, it also stresses the need for coordinated, harmonized, and complementary transport policies; improvement and expansion of existing links; and establishment of new ones so as to enhance physical cohesion of the member countries and facilitate intra-regional commerce and global connectivity. Such cooperation will alleviate constraints and bottlenecks along a value chain, improve connectivity for ease of flow of goods and services, add value to the regional economy and facilitate a competitive regional economy that will attract investments into the region, thus creating economic growth, as well as jobs and subsequently poverty alleviation.

The Uvinza- Kigadye SGR project constitutes an integral part of a new international trade corridor from the Tanzania central railway line linking Uvinza to the mining area in Musongati, Burundi. The aim of the Uvinza- Kigadye SGR is to connect the mining area around Musongati to world trade, via the Dar es Salaam seaport. It will also connect DR Congo through a proposed SGR extension from Gitega to Kindu in DRC. According to a study commissioned by the African Development Bank (AfDB) in 2009, Burundi is among the 10 countries in the world that have important deposits of nickel, cobalt, copper, iron, and platinum group elements, most of it still untapped. The most important deposit is the one at Musongati with estimated 185 million tons of nickel. This mining area needs a reliable freight and passenger transport connection with sufficient capacity to the central railway line in Tanzania. The proposed SGR is expected to link with the new SGR line from Tabora to Kigoma at the Uvinza District. However, Musongati in Burundi is not part of this ESIA although the SGR runs through Uvinza and Kasulu Districts in Tanzania into Musongati in Burundi. This ESIA only covers the SGR project located in Tanzania while the ESIA for the Burundi side of the SGR has been prepared by Burundi.

The Project is based on the Reliability, Availability, Maintainability, and Safety (RAMS) as the basic requirement for Infrastructure and all systems allowing for increased design speed of 160 km/h for passenger trains and of 120 km/h for freight trains. Design and construction shall comply with national and international guidelines on environment and social safeguards.

- **Project Objectives**

The main objective of the SGR Project is to provide efficient and sustainable transportation along the central corridor of Tanzania and to revitalize the railway transport sector to contribute to the national and regional economy. At the moment, over 90% of the cargo leaving the port of Dar es Salaam is transported by road thus, resulting in higher maintenance costs and higher rates of greenhouse gas (GHG) emissions. Therefore, the SGRs from Dar es Salaam to Mwanza, Kigoma and Kigadye will increase freight and passenger capacity and reduce road transport, thus releasing pressure on the road network and reducing GHGs. It will also contribute to providing the connection to landlocked countries of Burundi, Rwanda and the Democratic Republic of Congo (DRC) and providing access to those countries to the ports in Tanzania. The main objectives of the project include to:

- a) develop a reliable, cost-effective, efficient and seamless railway transport system to Burundi and DRC from the coast of the Indian Ocean.
- b) provide efficient and affordable transport services, promote trade, regional economic integration and the development of mining, manufacturing and agri-business within the corridor area.
- c) increase transport safety and protection of the environment.
- d) allow interoperability with new railway lines by modernizing standards, and
- e) increase the railway speeds and haulage capacity more than the existing railway line

- **The Environmental and Social Impact Assessment (ESIA)**

According to the Environmental Management Act (EMA) 2004 and the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations (2018), no development activity that has the potential to cause environmental and social risks and impacts shall be allowed to proceed without obtaining an environmental certificate from relevant authorities. The application for EIA is provided under Regulation 4 (A) of the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 whereas, in consideration of the magnitude of risks and impacts on the environment and social, projects are classified into four categories namely Type “A” category for mandatory EIA projects; Type: “B1” category for borderline projects; Type “B2” category for non-mandatory projects, and Special projects Category.

The Uvinza -Kigadye SGR project is about the construction of the railway lines in Tanzania and falls under category A projects. Category A projects are those likely to

have significant adverse environmental and social risks and impacts and that in-depth study is required to determine the scale, extent and significance of the risks and impacts and to identify appropriate mitigation measures before the project is allowed to proceed to construction.

In addition, the project falls under several international requirements including the African Development Bank (AfDB), which likely going to finance its construction. AfDB establishes the importance of (i) integrated assessment to identify the environmental and social impacts, risks, and opportunities of projects; (ii) effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them; and (iii) the client's management of environmental and social performance throughout the life of the project. According to AfDB's Integrated Safeguard System -Policy Statement and Operational Safeguards, the proposed Uvinza -Kigadye SGR project falls under Category 1 project, which are projects Bank operations are likely to cause significant environmental and social impacts, for which an ESIA is mandatory.

- **The Objectives of the Environmental and Social Impact Assessment (ESIA)**

The purpose of this ESIA is to ensure that the potential risks and impacts associated with the Project are foreseen and addressed early during the project's planning and design stage. The assessment's findings at different stages will be communicated to the feasibility and designing team to ensure their consideration into the designing process. It is expected that such planning and design arrangement will shape the project so that its benefits can be achieved and sustained without causing inadvertent problems.

This ESIA was conducted as a requirement of the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 and was done according to the Terms of Reference (ToR) approved by NEMC prepared during the scoping study and has accommodated requirements of the AfDB. The overall objective of this ESIA includes the following:

- Ensure compliance with the national regulations, guidelines and policies;
- Analyze the potential environmental impacts of the project taking into consideration key cross cutting issues including bio-physical environment, gender, climate change and social safeguards;
- Identify and assess environmental and social impacts, both adverse and beneficial in the project's area of influence;
- Ensure open and balanced process through public information by promoting improved social and environmental performance of the SGR Uvinza -Kigadye;
- Identify the project stakeholders, including the primary beneficiaries of the project who could positively or negatively be affected by the project;
- Assess the direct or indirect Environmental and Social impacts of the project and recommend mitigation measures to address the negative impacts and actions to enhance the positive impacts;

- Determine project compatibility with the surrounding environment;
- Assess the likely risks to climate change and recommend measures to climate change for the project;
- Incorporate environmental management plans and monitoring mechanisms during construction and operation phases of the project;
- Confirm if the project or any of its components and activities will trigger involuntary resettlement;
- Provide a comprehensive culturally appropriate and accessible Grievance redress mechanisms -GRM;
- Provide evidence of stakeholder's consultation (comprehensive lists of participants with contact;
- Provide a well-costed environmental and social management plan including plan and indicators to be used for monitoring of the effectiveness of the mitigation measures, and
- Generate baseline data that will be used to monitor and evaluate the mitigation measures implemented during the project cycle.

The ESIA identified and predicted potential consequences or impacts of the Project relating to physical, biological, social, health and economic environment to the immediate community and the larger population in general. It examined how the Project might cause harm to people, their properties and livelihoods and pay attention to potential benefits to be accrued from the Project that will increase opportunities for environmental conservation, economic growth, employment and poverty reduction so as to achieve sustainable development.

After predicting the potential problems and opportunities, the ESIA identified measures to minimize the problems and enhance the opportunities and outlined ways to improve the Project sustainability.

- **Scope of the Study**

The scope of this ESIA was to describe the environmental and social conditions of the project area of influence, identify environmental, social and economic impacts and benefits of the project, recommend mitigation measures, monitoring and management plans, and generate public view and opinions relevant to the project development and implementation.

The ESIA covered the following aspects:

- ✓ Review relevant documentation and literature related to the Project;
- ✓ Prepare a stakeholder participation plan including roles and responsibilities and incorporating gender and vulnerable groups;
- ✓ Develop a procedure to identify potential environmental and social impacts of specific activities, and measures to address and manage these impacts;

- ✓ The ESIA should also include institutional arrangements and information on the agency or agencies responsible for supervising project impacts; on the monitoring of the contractor performance;
- ✓ To disclose the ESIA to all interested stakeholders and invite their feedback and suggestions on the scope and adequacy of the proposed assessment, mitigation and benefit enhancement measures.
- ✓ Incorporate comments into the draft ESIA document from stakeholders including the TRC and AfDB and prepare final report for submission to NEMC

- **Study Approach and Methods**

The approach to this ESIA was guided by among others, the requirements under the Environmental Management Act (EMA 2004) and its regulations as well as adherence to AfDB requirements. Broadly, it involved an understanding of the project background, preliminary route selection, project phases as well as the baseline conditions in which the project was to take place. Desk top studies formed the basis of understanding of various aspects of the project including reports from Kigoma, Uvinza and Kasulu. Stakeholders' participation and engagement was conducted with groups of stakeholders at regional, districts, wards and villages levels, private sector and NGOs in the project area

Baseline information was obtained through physical field studies and investigations in the project site including collecting samples of various biological and ecological species, field data collection involving socio-economic, air quality noise and vibrations, desktop studies, and public consultations and engagement with members of the community living in the project areas. Additional approaches and techniques included, surveys, photography, and discussions with the project Proponent. The collected data were analyzed qualitatively and quantitatively and interpreted in relation to key issues relevant to national policies, laws and international standards and principles.

- ✓ **Assessment of Positive and Negative Impacts**

Impact identification and prediction were key processes that enabled estimation of the magnitude, extent and duration of the potential impacts. Impact magnitude relate to the severity of the impact, whether the impact is reversible or irreversible, and the potential rate of recovery from the impact. The extent of the impact related to the area of influence of the impact, which could be site-specific, limited to the project area, regional, national or even international. Impact duration relate to temporal dimensions: those lasting for only 3 years after project initiation were classified as short-term; those continuing for 10 years or more but less than 20 years were considered medium-term; while those lasting beyond 20 years were considered long-term.

This exercise also reviewed and analyzed interaction between the proposed project and the existing environment. Distinction was made between significant positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts. Impacts, which are unavoidable or irreversible, and cumulative impacts. Wherever possible and applicable, impacts were described quantitatively.

✓ **Consideration of Alternatives**

The analysis of alternatives included the examination of the 'no project' alternative, which assesses environmental conditions without the project. It also describes how the alternatives compared in terms of potential impacts, costs, suitability under local conditions, as well as institutional, training, and monitoring requirements.

Corridor- alignment: This included consideration of alternatives that were examined while developing the proposed project. The present alignment is an outcome of the analysis that was carried out during scoping. At that time, three options were considered namely the Uvinza - Makere – Katanga Corridor; the Uvinza- Kasulu- Kigadye Corridor and the Kigoma – Buhigwe - Nyamugali Corridor. The analysis of alternatives focused on Corridor length; ecological and environment issues; Operational conditions/Traffic and transport criteria and easy in accessibility during construction. No alternative discussion of other aspects of alternatives were considered (i.e., technology, location and size of stations, borrow pits, quarry sites, workers camps etc. because the sites for these facilities were not identified.

The Uvinza - Kasulu -Kigadye alternative was chosen as the preferred alternative because it met positively most of the above criteria and it is one that this ESIA has focused.

Station Locations: A concern was raised by stakeholders regarding location of stations such as having a station at Nyakitonto village given that it is the headquarters of Kasulu District and a hub for many economic activities including plans to have an international market and a ware house for storage of crops and a proposed cement plant.

Further, there were proposals for a station at Kilelema boarder village in Buhigwe District because, this village is the center of revenue generation for Buhigwe District and there are plans to construct a bridge linking with Burundi from that village. The district argues that having a station in that location will stimulate further economic growth in the district, and increase flow of business between Tanzania and Burundi.

Realignment Alternative: A concern was raised regarding the present alignment that is cutting through a sensitive military area. The military extended its boundaries to include part of the land that was previously under community use. Compensation to affected persons is underway. Therefore, the military, the district and the region are concerned that the current location of the alignment is cutting across the military and the proposed

Shunga Station and a passing loop are also in the military area. The alignment is cutting through several water supply systems and streams that feed the Camp. The military is concerned that having the railway line, the station and passing loop inside the military area will comprise not only security matters but also and more so, limit the planned expansion and development of the camp. It therefore suggested to realign this alignment, relocate the station and the passing loop so as to avoid the military area.

✓ **Structure of the Report**

Table 0-1: Structure of the ESIA Report

Chapter	Description
Executive Summary	Provides a short summary of each chapter in the EIA report
Acknowledgement	Express the appreciations and gratitude of the proponent in completion of the study
Abbreviations and acronyms	Provides the list of word used in the EIA Report in short term
Chapter 1	Introduction Provides a background to the proposed project, summarizing the rationale of the project
Chapter 2	Project Background and Description Describes the proposed project and its nature, together with the planning, design, and activities of the project
Chapter 3	Analysis of Project Alternatives This chapter provides the opportunity for an unbiased, proactive consideration of options, to determine the most optimal course of action. The selection of alternatives is a crucial undertaking in conducting ESIA.
Chapter 4	Legislation and Policies. Describes the legal and regulatory framework for the ESIA, including relevant international conventions and policies. Describes the authorized bodies that will be involved in the ESIA process
Chapter 5	Baseline Environment and Social Conditions Describes the existing physical, biological and socio-economic environment that could be affected by the project.
Chapter 6	Stakeholder Identification and Participation

Chapter	Description
	This chapter describes the how the people who affected by the project either positively or negatively were involved in the project
Chapter 7	Impact Identification, Assessment and Evaluation This chapter describe on how impacts identified and how will be characterized to be compatible to the environment
Chapter 8	Mitigation Measures This chapter provides details regarding mitigation measures to be undertaken
Chapter 9	Environmental and Social Management Plan. This chapter describes the systematic plan on how to implement the measures provided in chapter six and responsible personnel and cost of implementation
Chapter 10	Environmental and Social Monitoring Plan. In this chapter describes on how to control the parameters of elements which seems to be more averse to both environment and community
Chapter 11	Cost Benefit Analysis. This chapter provides compilation of a comprehensive list of all direct and indirect costs, intangible costs, opportunity costs and the cost of potential risks and direct and indirect revenues and intangible benefits, such as increased production from improved employee safety and morale, or increased sales from customer goodwill associated with the project or decision
Chapter 12	Capacity Building Requirement for TRC to implement ESMP This chapter provides information regarding capacity development for TRC to oversee the project and implement the ESMP
Chapter 13	Summary and Recommendation Provides the outcomes or results of the proposed project and final judgment and decision
Chapter 14	References Provide a list of cited materials

Chapter	Description
Chapter 15	Annexes Provides a list of evidence about the ESIA process and the Proponent

✓ **Public Disclosure of Draft ESIA**

Information relevant to the project was disclosed at different stages of the ESIA process as part of the Stakeholder Engagement process. Disclosed information included the purpose, nature, and scale of the project; the duration of the various project activities, risks and impacts arising from the project and mitigation measures including issues related to compensation and the rights of the affected persons to various remedies as provided by laws of Tanzania. Information regarding stakeholders with respect to grievance redress mechanism and a process that stakeholder can use throughout the ESIA and the project circle. process. The following channels have been established for registering a grievance:

- ✓ Written communication via Project Grievance Forms
- ✓ Verbal communication in-person or via telephone to village representatives or TRC
- ✓ Via toll-free Project hotline (0800-110-042) monitored by two designated TRC personnel.

The ESIA report will also be shared through open public domains such as TRC and AfDB websites, regional and district offices so as to enhance sharing of information.

• **Policy, Legal and Regulatory Framework**

The ESIA study is conducted in compliance with relevant policy, legal and administrative framework of the United Republic of Tanzania including the Environmental Management Act 2004, and the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations (2018) and the African Development Bank's Environmental and Social Guidelines and Policies and other Good International Industry Practice (GIIP).

The project triggers both national and international regulatory instruments and requirements. In terms of environmental management, the National Environment Management Council (NEMC) is the statutory institution that regulate, manage and protect the environment and by extension guides the Environmental and Social Impacts Assessment process (ESIA), while the Minister of State for Environment authorize the issuance of environmental certificate.

✓ **The National Environmental Management Council (NEMC)**

The EMA (2004) empowers NEMC to manage the EIA process which includes screening and approval of ESIA reports. After approving the ESIA reports, EMA (2004) requires NEMC through the Minister responsible for Environment to issue an Environmental Certificate. Therefore, the EIA process for the proposed Uvinza – Kigadye railway project will be managed by the same institution.

Other institutions whose administrative decisions will be relevant to the proposed development include the Ministry of Land, Housing and Human Settlement for land issues, the Ministry of Water and Irrigation for water related issues, Tanzania Forest Services under the Ministry of Natural Resources and Tourism (Forestry Division) will be responsible for issues related to the loss of forest and forest products. Tanzania Wildlife Management Authority (TAWA) will be responsible for wildlife related issues. This ESIA addresses the administrative set up and the extent the project has fostered co-ordination among key decision makers and actors.

✓ **African Development Bank (AfDB)**

African Development Bank Group's Integrated Safeguards System: Policy Statement and Operational Safeguards, 2013

The environmental and social safeguards of the African Development Bank (AfDB) are a cornerstone of the Bank's support for inclusive economic growth and environmental sustainability in Africa. The Bank has developed an Integrated Safeguards System (ISS) in order to articulate its safeguard policies while improving their clarity, coherence and consistency. The ISS builds on a variety of previous policies and safeguards. The ISS brings these policies and strategies into a consolidated framework that is intended to enhance the effectiveness and relevance of the Bank's work. The ISS contains four interrelated components that include:

- **The Integrated Safeguards Policy Statement** – It describes common objectives of the Bank's safeguards and lays out policy principles. It is designed to be applied to current and future lending modalities, and it takes into account the various capacities and needs of regional member countries in both the public and private sectors.
- **Operational Safeguards (OSs)** – are a set of five safeguard requirements that Bank clients are expected to meet when addressing social and environmental impacts and risks.

- **Environmental and Social Assessment Procedures (ESAPs)** – This provides guidance on the specific procedures that the Bank and its borrowers or clients should follow to ensure that Bank operations meet the requirements of the OSs at each stage of the Bank’s project cycle.
- **Integrated Environmental and Social Impact Assessment (IESIA)** – These Guidance Notes provide technical guidance to the Bank’s borrowers or clients on standards on sector issues, such as roads and railways, hydropower, or fisheries, or on methodological approaches clients or borrowers are expected to adopt to meet OS standards.

The AfDB’s Operational Safeguards include the following:

Operational Safeguard 1: Environmental and social assessment – This overarching safeguard governs the process of determining a project’s environmental and social category and the resulting environmental and social assessment requirements.

Operational Safeguard 2: Involuntary resettlement land acquisition, population displacement and compensation – This safeguard consolidates the policy commitments and requirements set out in the Bank’s policy on involuntary resettlement, and incorporates a number of refinements designed to improve the operational effectiveness of those requirements.

Operational Safeguard 3: Biodiversity and ecosystem services – This safeguard aims to conserve biological diversity and promote the sustainable use of natural resources. It also translates the commitments in the Bank’s policy on integrated water resources management into operational requirements.

Operational Safeguard 4: Pollution prevention and control, hazardous materials and resource efficiency – This safeguard covers the range of key impacts of pollution, waste, and hazardous materials for which there are agreed international conventions, as well as comprehensive industry-specific and regional standards, including greenhouse gas accounting, that other multilateral development banks follow.

Operational Safeguard 5: Labor conditions, health and safety – This safeguard establishes the Bank’s requirements for its borrowers or clients concerning workers’ conditions, rights and protection from abuse or exploitation. It also ensures greater harmonization with most other multilateral development banks.

Description of the Project Environment

- **Project Location**

The Uvinza – Kigadye SGR will traverse from Uvinza District through Kasulu and Buhigwe District in Kigoma Region across the Malagarasi River in Kigadye village into Burundi. The proposed railway line is expected to link with the Tabora-Kigoma SGR line, now under construction, and the SGR Dar es Salaam to Mwanza railway line via Isaka now under construction. From the starting point the Uvinza – Kigadye Railway line covers about 156.4km railway traversing from Uvinza through Kasulu and Buhigwe districts before crossing Malagarasi River boarder into Burundi. This ESIA however, covers the Tanzanian section which ends at Kigadye village at the border between Tanzania and Burundi. The villages, wards and districts traversed by the proposed SGR is presented in Table 0-2and Map 0-1.

Table 0-2: Districts, Wards and Villages traversed by SGR from Uvinza to Kigadye

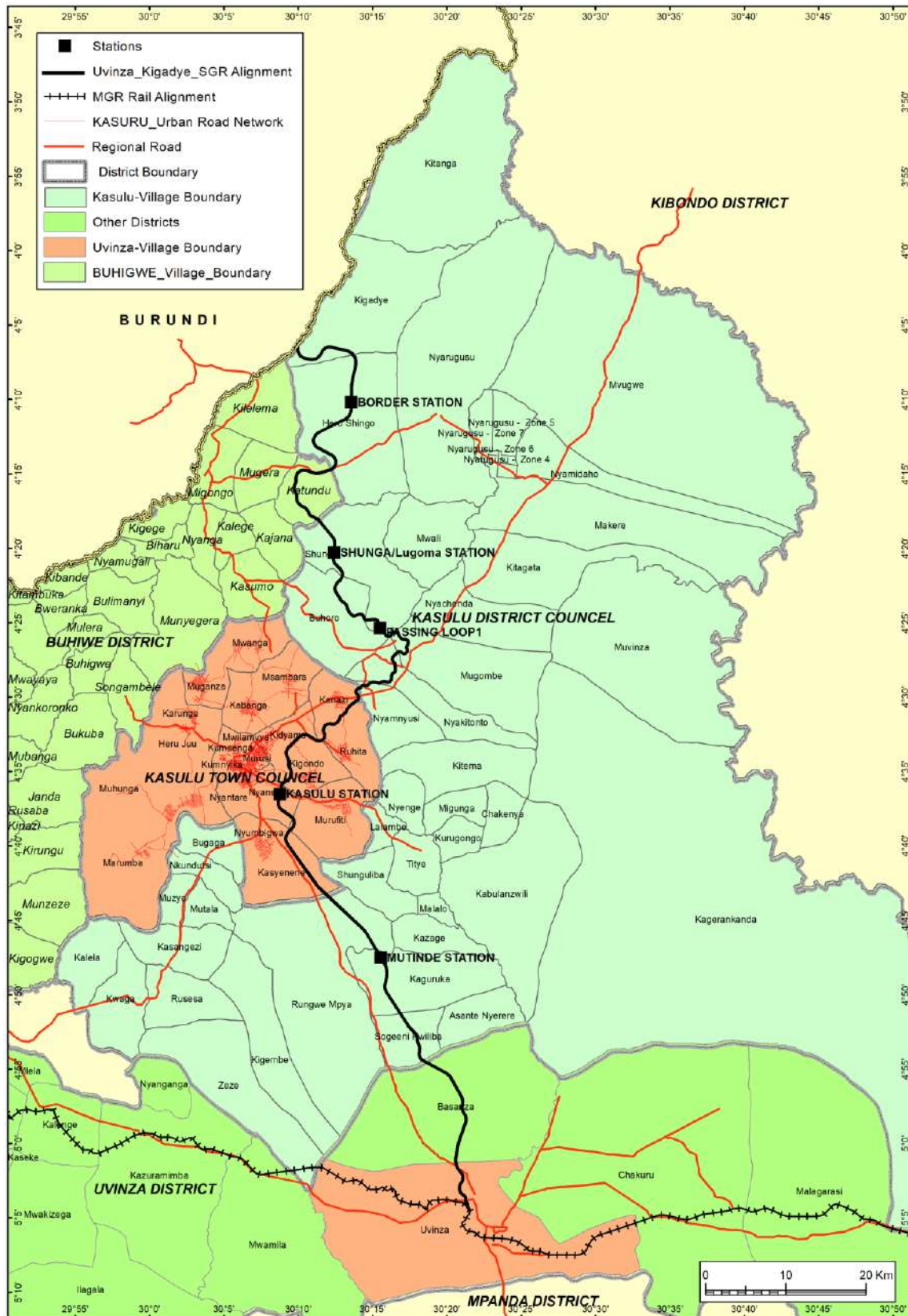
S/n	Region	Districts	Wards	Villages
1	Kigoma	Uvinza	Uvinza	Ruchugi
2	Kigoma	Uvinza	Uvinza	Chakuru
3	Kigoma	Uvinza	Basanza	Basanza
4	Kigoma	Uvinza	Basanza	Msebehi
5	Kigoma	Kasulu	Asante Nyerere	Sogeeni Kwiliba
6	Kigoma	Kasulu	Rungwe Mpya	Kaguruka
7	Kigoma	Kasulu	Rungwe Mpya	Rungwe Mpya
8	Kigoma	Kasulu Town	Nyumbigwa	Mwenda
9	Kigoma	Kasulu Town	Muruti	Murufiti
10	Kigoma	Kasulu Town	Nyansha	Nyansha
11	Kigoma	Kasulu Town	Nyansha	Kumbanga
12	Kigoma	Kasulu Town	Kumhama	Kumhama
13	Kigoma	Kasulu Town	Kigondo	Kidyama
14	Kigoma	Kasulu Town	Ruhita	Ruhita
15	Kigoma	Kasulu Town	Ruhita	Kanazi
16	Kigoma	Kasulu	Nyamnyusi	Nyamnyusi
17	Kigoma	Kasulu	Nyakitonto	Nyakitonto
18	Kigoma	Kasulu	Nyakitonto	Katonga
19	Kigoma	Kasulu	Nyakitonto	Katonga
20	Kigoma	Kasulu	Buhoro	Buhoro
21	Kigoma	Kasulu	Buhoro	Nyamsanze
22	Kigoma	Kasulu	Buhoro	Lugoma

23	Kigoma	Buhigwe	Mugera	Katundu
24	Kigoma	Kasulu	Heru-Ushingo	Heru-Ushingo
25	Kigoma	Kasulu	Heru- Ushingo	Kigadye

Source: Field Data June 2023

- **Project Components**

The proposed Uvinza –Kigadye SGR will have the following components of the railway development project i) land acquisition for the railway corridor (way leave, access roads), embankment (track, bridges, underpass/overpasses, ATS & catenary, signalling and communication network, ii) dump sites, borrow pits, rock quarry sites, iii) station, marshalling yard, and maintenance depots. Associated facilities such as power transmission line will be subjected to a separate ESIA under the power utility company TANESCO. The new Uvinza-Kigadye (Kasulu District) railway line will be based on the American Railway Engineering and Maintenance of Way Association (AREMA) latest standards (which promote inter-operability) – that is the Standard Gauge, allowing for increased design speed of 160 km/h for passenger trains and of 120 km/h for freight trains.



Map 0-1: Location of the Uvinza -Kigadye SGR Alignment

The information on the socio-economic characteristics of the districts and villages/communities through which the project passes is presented in Chapter 4 of the main report. In this ESIA, the AoI is defined through a spatial characterization of the local area from 0 km at the central line to 5 km or beyond, depending on activities happening in each area. Thus, the AoI may include subregion areas depending on the Project activities and their implications on environmental and social parameters. Areas where construction materials will be extracted from even if they are beyond 5 km from the central line, formed part of the project AoI because of the potential risks and impacts that might occur as a result of getting and transporting such construction materials.

- **Route Description**

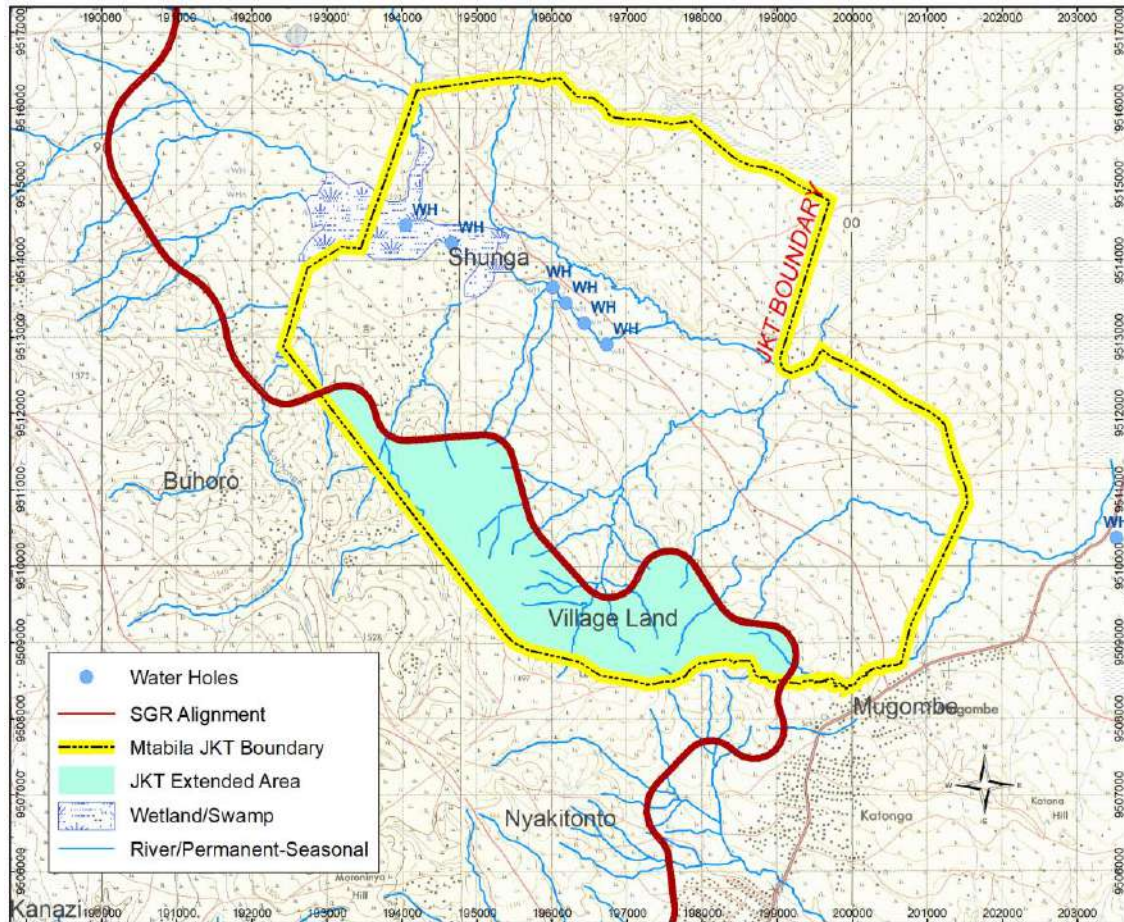
The nature of the environment within which the railway corridor traverses is very variable ranging from areas with high rainfall to arid and semi-arid areas. Unlike other SGR lots (1-6) currently under construction in Tanzania where their alignment runs almost parallel to the existing Meter Gauge Railway (MGR), the Uvinza -Kigadye SGR will be built on completely new areas, thus touching sensitive receptors such as community lands, forest reserves, wetlands, water sources and social services public institutions and economic infrastructure such as roads both in rural and urban areas, and leading to further opening of the vast lands in the western side of Tanzania.

The route in which the SGR Project traverses range from areas with high rainfall to arid and semi-arid areas. The topography of the project railway alignment is characterized by undulating to nearly flatland, rolling, to rolling terrains which are dissected by both perennial and seasonal rivers. In Uvinza, the railway line will traverse through areas which are relatively flat up and ascends gently bypassing Msebei Hill to Kasulu, and then from Kasulu, the railway project is expected to meander and ascend gradually through a series of hilly areas up to the Heru Ushingo area. The project then traverses through the lowland area of the Malagarasi River and floodplain before running through extensive lowlands of sugar cane plantations.

The major drainage system includes Malagarasi, Ruchugi, Mgera and Muyowosi Rivers. However, there are several smaller but significant drainage systems, which cross the railway line and therefore require bridges. These variations produce different types of vegetation such as natural miombo woodland in Uvinza, Basanza, Nyansha and extensive farmlands in Nyansha-Kasulu-Mtabila, From Mtabila to Shunga and Buhigwe (Kitundu), shrubs to wooded grassland to open grassland and woodlots of *Eucalyptus* *ssp* and *Pynus patula* characterize the SGR corridor.

In Kasulu District Council, the proposed SGR for Uvinza - Kigadye route traverses a sensitive area close to Nyakitonto village in Nyakitonto ward, following the government decision to extend the boundaries of the previous refugee camp that has since been converted to a sensitive installation. The government has already carried out valuation of the affected properties and people in that area and compensation will be paid from

the 2022/23 national budget so as to allow activities in this area to proceed. In view of this, and given the sensitivity of this area, it will be important to reconsider -realignment of the route going more than 400m south-west from the current extended boundary so as to avoid this sensitive area. Map 2-2 shows that said area relative to the current SGR alignment and the extended boundary.



Map 0-2: Uvinza - Kigadye SGR crossing a sensitive installation at Nyakitonto Village.

- **Project Activities**

The implementation of the Uvinza -Kigadye SGR will be conducted in phases as follows:

- Design and mobilization Phase.
- Construction Phase.
- Operational Phase.
- Project decommissioning phase

Baseline conditions

✓ Introduction

✓ Demographics

Table 0-3: Population distribution in the project affected district and wards

Districts	Wards	Population			Number of households	Average Household size
		Male	Female	Total		
Districts						
Kasulu D.C		260,932	276,835	537,767	102,332	5.3
Kasulu T.C		112,167	126,154	238,321	47,663	5.0
Buhigwe		112,684	127,321	240,005	45,117	5.3
		485,783	530,310	1,016,093	195,112	5.2
Wards						

Kasulu	Rungwe Mpya	9,576	10,292	19,868	4,036	4.9
Kasulu Town	Nyumbigwa	5,645	6,275	11,920	2,154	5.5
Kasulu Town	Murufiti	4,693	5,284	9,977	1,819	5.5
Kasulu Town	Nyansha	7,490	8,234	15,724	3,089	5.1
Kasulu Town	Kigondo	11,466	12,386	23,852	4,568	5.2
Kasulu Town	Ruhita	7,680	8,358	16,036	3,137	5.1
Kasulu	Nyamnyusi	7,878	8,533	16,411	3,105	5.3
Kasulu	Nyakitonto	9,774	10,397	20,171	4,094	4.9
Kasulu	Buhoro	8,256	8,816	17,072	3,302	5.2
Kasulu	Heru Ushingo	17,942	18,689	36,631	7,927	4.6
Buhigwe	Mugera	7,839	8,444	16,283	3,056	5.3

Source: 2022 Tanzania Population and Housing Census

Based on the above 2022 population statistics the total population in the Project area for the three district councils is 1,016,093 people of which 485,783 are males and 530,310 are females with a total of 195,112 households and average household of 5.2. The Project is likely going to attract an influx of people into the project area thus raising the population in the villages in the Project area. In addition, since most of the job seekers are likely to be young, who are in the active reproductive age, it is also likely that population growth in the Project area will be accelerated through natural increase.

✓ **Livelihood**

The main source of livelihood for the residents within the project terrain is farming, fishing and livestock keeping activities. Several residents are involved in subsistence farming specifically in maize, beans, rice, vegetables cassava, etc. Irrigation agriculture is practiced in Uvinza, Kasulu and Buhigwe districts. Irrigation is mainly for paddy, horticultural crops, and maize during dry seasons. Irrigation for horticultural crops is mainly carried out along river valleys. In Kasulu district, irrigation agriculture is practiced in Titye, Lalambe, Nyenge & Migunga (Titye ward), Rungwe Mpya, Kaguruka, Nyumbigwa (Rungwe Mpya), Kabanga, Buhoro, Msambara, Kidyama and Kanazi (Msambara ward). In Uvinza district irrigation is practiced in Kashagulu, Mgambazi,

Nkonkwa and Machazo valleys. The proposed railway line traverse some of the villages with irrigation agriculture such as Rungwe Mpya, Kidyama and Buhoro in Kasulu district. Fisheries is an important economic activity in all affected districts The Uvinza district has potentials for aquaculture because in the southwest the district is boarded by Lake Tanganyika which has 6,425km² of water body, a shoreline of 212km, and the Sagara and Nyamagoma dams as well as Malagarasi river. In Kasulu district fish farming activities are conducted in Nyakitonto, Mugombe, Heru Ushingo, Kagerankanda, Mvinza, Rungwempya, Nyamidaho, Kitagata and Mwali. A total of 900 households are involved in fish farming activities in groups and individually and it is estimated that about 52 tons produced and consumed domestically.

✓ **Transportation**

The proposed Project location does not have well established access road and during the raining season, the Uvinza to Kigadye SGR Project becomes nearly inaccessible during to the competing natural drainages, wetlands, swamps and others. The Kasulu Town Council has a total road network of 294.55Km of which 203.5Km are earth roads, 90.05Km are gravel roads and 1.5km are tarmac roads. The situation indicates that 294.55 Km are earth roads and are averagely in fair condition. Kasulu District Council, TARURA has so far been maintaining gravel roads (146. km) and Earth roads (245 km) which make up a total of 391.3 km only. Currently, in Buhigwe district there are no tarmac roads. It has a total of 574 km of road3, out of which 30 km is trunk roads, 60km is Regional Roads, 282 km is District Roads, and the remaining 202 km is feeder roads. Generally main regional road and truck road are passable throughout the year but feeder roads and District roads are traversed with difficulty during rainy season. The survey revealed that transportation sector has huge economic potential and dividend when prioritized by the national government. The implementation of project will require improvement of the available roads and bridges for transportation of construction materials and equipment.

✓ **Health conditions and facilities**

Along the proposed Uvinza – Kigadye SGR Project there are several dispensaries and health centres in almost all affected villages. There are also hospitals at the district headquarters. The health services delivered in town of Kasulu, Uvinza and Buhigwe is better compared to rural communities. This is mainly due to presence of good facilities in urban area as compared to rural area. Malaria has been a leading killer disease amounting 31,047 cases and 199 deaths, following by Neonatal Condition 376 cases and 85 deaths, PEM number of cases 400 and 71 deaths respectively. Others are AIDS/STI and TB. Children are most vulnerable group affected by these diseases.

✓ **Education**

Literacy attainment among the population varies, and shows significant inequality, by gender, locality and income. Based on the assessment results show that more than half (62.5 percent) of the interviewed heads of households have attained basic primary

education and about 9.7 percent have attained secondary education. In addition, there is a significant number (16.7 percent) of heads of households who have not attained any formal education. There is also a significant number of the head of households 6.4 percent who dropped out from primary schools..

✓ **Energy**

The electricity supply system in Tanzania is operated by the Tanzania Electricity Supply Company Limited (TANESCO). However, most of the affected villages have not been connected to the National Grid. Therefore, over 90% of population in the project area depends on fuel wood energy for domestic cooking. This makes attention on the need for forest management and conservation. Solar energy is also used for lightning, however, the energy which generated by solar panels from sun rays is limited to few institution buildings belonging to government and to a very few individuals' premises. Fossil fuels such as diesel, oil, and petrol are used to energize transport and various commercial establishments. For the case of urban and rural population a significant proportion depends on kerosene for lighting rather than generator.

✓ **Water supply**

Uvinza district has about 52.9 percent of its population who get water from different improved sources such as springs, rivers, deep and shallow wells and Lake Tanganyika. The main rivers used as a source of water in Uvinza district include River Mugonya, Luiche and Mukuti. Rain harvest is also undertaken during rainy season. In Kasulu Town, 62.4% of the district population has access to clean, affordable, and safe water from various. There are 11 Gravity piped schemes, 6 bore holes, 43 spring water scheme, 3 shallow wells and 8 rain water harvesting tanks. There are 208 sources of water not yet utilized this comprises 57 shallow wells, 74 spring water and 56 streams. Buhogwe district has 23 gravity water, 36 shallow wells, 108 protected springs and 32 infrastructures for rain water harvest.

✓ **Waste generation and disposal**

Currently, there are no specialized waste disposal sites within along the proposed project area. Wastes in Kasulu, Uvinza and Buhigwe towns and other commercial waste generated are usually buried, burnt or dumped in the open or wastelands. Given the prospects of the proposed Uvinza to Kigadye SGR Project, waste generation, collection and management will be eminent during both the construction phase and the operational phase of the project development. Therefore, it is imperative to begin conversation relative to the plans, development and design of a future landfill site that would complement the Uvinza to Kigadye SGR Project activities.

Major and Moderate environmental risks and impacts

- **Positive Impacts**

- ✓ ***Increased employment opportunities***

Youth employment situation remains one of the key challenges in Tanzania. The Integrated Labour Force Survey 2014 shows that unemployment rates are highest for persons below 35 years of age in all areas. The total number of employed youths (aged 15-34) according to the National Definition is 11,007,809 while the unemployed youths are 1,463,182 about 10.0% of the total youth workforce (ILFS, 2014.). Various range of interventions involving not just government agencies, but other stakeholders including civil society organizations, international donors and, to a lesser extent, the private sector are being undertaken to increase employment opportunities in the country.

Based on the above standpoint, the proposed development will create some employment opportunities for casual workers. Establishment of construction camps during mobilization phase will create direct and indirect employment to the locals as well as people from other places. Direct employment will be in the form of both unskilled and skilled laborers. More opportunity for employment is expected during construction phase when much more labour will be required in the construction of access roads, earth works, rail embankments, laying of rails, construction of terminal, stations, bridges, culverts and other related infrastructures. The construction phase will also create indirect employment to different people including food vendors (especially women) and other small businesses like sale of soft drinks. The estimated labour force in all phases of the project is shown in Table 2-4.

- ✓ ***Increased government revenue generation***

Transportation of goods is the main objective for the projects and therefore will have a significant impact to the government revenue through taxes due to transportation of goods and containers at Dar es Salaam to Gitega through Uvinza railway station. The significant increase in Government revenue will start to be realized during operation phase due to transportation of different goods such as mineral like nickel from Msongati and other services. The railway line will also stimulate agriculture, mining and industrial development. However, economic benefits due to the Uvinza Railway station are unclear because it is not one of the stations to be further developed as part of the Uvinza to Kigadye Railway project.

Similarly, revenue will come from taxes that will be collected as revenues from transportation of different goods as the project is expected to operate in three major traffic groups namely, international transit movements of freight to and from Burundi International imports and exports to and from Dar es Salaam harbour and Local domestic movements of freight and passengers along Uvinza, Kasulu to Kigadye

Another source of government revenue during operation phase will come from a large number of employees who will be paying their taxes to the government as "Pay-as-You Earn (PAYE).

✓ ***Improvement of local economy***

It is without doubt that, the transport sector plays a pivotal role in the transportation of goods from one destination to another and hence boosting the agricultural, industrial and other sectors of the economy. The railway project will stimulate local economy and improve the quality of life of people living along the proposed railway line in the two countries. This is because the railway traverses areas with potential for agriculture and mining development.

Agriculture is the leading sector in the Tanzanian economy and it is going to continue to be so for several decades to come. The sector contributes approximately 50% to the country's GDP: food crops contributing about 35% of the agricultural GDP followed by livestock production, which accounts for 30% of the agricultural GDP. In fact, agriculture contributes over 60% of export earnings. It is estimated that about 95 to 97% of the food consumed in the country is produced locally with imports consisting mainly of food items that are not produced in adequate quantities in the country e.g. wheat and sugar.

During construction and operation phase, the local people both unskilled and skilled will be employed in different activities. This will generate income to the people who will be capable of buying and paying for their different needs. The railway line also traverses remote areas without any means of transport. During the operation phase, the railway line will open up these areas and reduce the transport costs as well as increase its reliability and facilitate movement of agricultural products in villages such as Rungwe Mpya, Katundu, Buhoro and Basanza which are potential for production of rice, maize, bananas, cassava and sugarcane.

It is therefore anticipated that the construction of the railway line will stimulate agricultural development because of reliable transport which will increase farmer's accessibility to markets. The impact of this railway investment will thus be long-term and highly significant during the operation phase of the project.

The railway will also facilitate movement of farm implements, promote petty business along the project area; increase income to local communities; facilitate transportation of construction materials; and reduce the price of construction materials and enable people to build modern houses and hence improve the quality of their lives. On the other hand, the project will have negative impacts during the decommissioning phase because laborers will be retrenched and hence the loss of their major means of income.

✓ ***Enhanced Regional Trade***

The proposed Uvinza - Kigadye railway line would be connected to Dar es Salaam - Kigoma railway line at Uvinza through another initiative, which is upgrading the existing Dar es Salaam – Kigoma railway line to Standard gauge. The Uvinza - Kigadye railway line will transverse in Uvinza and Kasulu district where crops such as maize, paddy and cassava are produced and in high demand in Burundi. In addition, the railway line could enhance trade of salt produced at Uvinza. Unfortunately, this project does not seem to include improvement of Uvinza railway infrastructure that links to the nearby salt industry in terms of transportation. If this is the case, it must be very unfortunate as the

Uvinza - Kigadye railway will significantly negate the economic potential of Uvinza District and Kigoma region.

The infrastructure will therefore be expected to reduce the cost of doing business in the region hence attract several investments needed to stimulate the necessary economic growth. Enhance regional trade will create economic growth and jobs and generate wealth and personal incomes with the country and East Africa in general significantly.

✓ ***Improved transportation system***

During the operation phase, cargo and passengers' transportation would be the most fundamental activity. The Uvinza – Kigadye railway line will provide a huge transportation in the excising central line as it will connect to the Central Line via Kaliua. Also, it will facilitate regional trade by linking the Democratic Republic of Congo through Rwanda and Burundi. This railway line goes through salt mining areas in Uvinza, hence the salt products from Uvinza would be transported to various markets in Burundi, Rwanda and Tanzania. Food and cash crops including livestock would be transported to and from various markets as well as raw materials to the related industries.

- **Negative Impacts**

✓ ***Loss of land, assets and other properties***

Loss of land

Loss of people's land and other properties is one of the significant impacts in this project. The mobilization phase of the proposed railway project will involve acquisition of land for railway line, camps and stations. The preliminary design shows that the proposed railway line will cover 156km between Uvinza (Tanzania)to Kigadye. Since most of line traverse rural areas a 60m right of way will be required or a total of approximately acres will be acquired. Additional land take will be required for railway stations and e.g at Kasulu, The total affected land required for railway corridor from Uvinza – Kigadye is about **12,975,120m²** equivalents to 3,206 acres and the total size of land required for stations is about **1,168,000 m²** equivalents to 289 acres of land.

In addition, the field assessment noted that about 160 plots of agricultural land which is used for permanent and seasonal crop cultivation will be affected. As such, agricultural activities as means of their livelihoods in terms of food and source of income will be affected by the Uvinza –Kigadye SGR Project. **Table 0-4** provides number of the lost plots used for agricultural activities. Approximately 1,509.48 acres will be affected for the agricultural land. Table 7-4shows the estimated number of potential agricultural land to be affected by the SGR project.

Table 0-4: Potential affected agricultural land along the project

District	Ward/Village	Plots for Agriculture activities
Uvinza	Ruchugi	5
	Msebehi	17
Kasulu Town	Ruhita	30
	Mwenda	14
	Nyansha	28
Kasulu District	Rungwe Mpya	4
	Kaguruka	9
	Nyamnyusi	3
	Mukesha	15
	Nyamsanze	18
	Herushingo	2
	Sogeeni kwiriba	3
Buhingwe	Kajana	2
	Katundu	10
Total		160

Source: TRC, Field survey (2023)

Loss of crops and trees

Moreover, the construction activities will result in the clearing of crops and trees cultivated/planted along the project area. These include perennial crops which take more than a year to reach full maturity and can be harvested over a long period such as fruit trees (orange, lemon, guava, mangoes, baobab etc. Also, annual or seasonal crops taking less than six months to reach maturity for harvesting such as Maize, Beans, Cassava, Groundnuts, Rice, Sunflowers, Cottons, Millet, and Potatoes will be affected and usually valued in terms of acreage. Total of 2,939 trees will be affected

Table 0-5: Number of projects affected properties

Regions	District/Municipal/Town Council	Village/Mtaa	PAPs Crops trees	Losing and
Kigoma	Uvinza District Council	Ruchugi	13	
		Basanza	17	
		Sogeeni-Kwiriba	28	
		Msebehi	8	
	Kasulu Town Council	Nyansha	59	

Regions	District/Municipal/Town Council	Village/Mtaa	PAPs Crops trees	Losing and
		Buhoro	43	
		Ruhita	110	
	Kasulu District Council	Heru Shingo	15	
		Mwenda	36	
		Nyakitonto	38	
		Kaguruka	34	
		Kigondo	2	
		Korongo	21	
		Rungwe Mpya	21	
		Buhigwe District Council	Katundu	32
	Kajana		2	
	Nyamnyisi		3	
TOTAL		482		

Source: TRC, Field survey (2023)

✓ Loss of structures and properties

There are several residential structures along the proposed railway line that will be affected by the project. Following the results of the field survey performed and the subsidiary counting of houses along the proposed line it is estimated that about 506 houses will be affected in the right of way and have to be removed. There are graves which will be affected by the project because they are located within the wayleave of the railway line. The acquisition process will be undertaken during project mobilization. This that the affected people will be required to demolish and vacate their house before the commencement of construction. The number of houses to affected is shown Table 0-6.

Table 0-6: Potential number of affected structures and properties

Villages/Steet	Complete residential structures	Incomplete/under-construction structures	Outside Toilets	Outside Kitchen	Farm/ animal shades	Total structures
Uvinza	16	7	2	1	0	26
Kasulu Town	29	6	4	11	1	51
Kasulu District	95	23	21	18	0	157
Buhingwe	24	0	1	6	0	31

Total	164	36	28	36	1	265
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Source: TRC, valuation report (2023)

✓ **Impact on Public infrastructures and services**

Field observation noted that there will be public infrastructure that will be affected by the proposed project development. The impact will be critical during mobilization and construction. There will be underground water pipes and sewage system infrastructure in Kasulu town and Kasulu district, particularly at Mtabila National Service camp, mgogo primary school in Katundu village in Buhigwe district that will be affected by the proposed SGR line from Uvinza to Kigadye. Village. Table 6-6 shows the potential infrastructure and properties to be affected by the proposed SGR project.

Table 0-7: Potential infrastructure and properties to be affected by the proposed SGR project

District	Village	Institution Name	Type of Institution	Affected Properties
Uvinza	Migongwe	Tuungane Group	CBO	Land
		Mtaa Migongwe-Ruhita	Village government	Land & Crops
	Nyansha	Free Pentecostal Church Of Tanzania-Nyansha	Religious	Land & Crops
Kasulu District	Rungwe Mpya	Taasisi ya Matumizi Bora ya Ardhi	Agricultural production	Land & Crops
	Kaguruka	Kaguruka	Village government	Land
		Chama cha Msingi Matabaro AMCOS	SACOSS	Structure & Land
		Baptist Church Tanzania-Nyakitonto	Religious	Land & Crops
	Mukeshu	Mukeshu	Village government	Land
	Nyamsanze	Eneo la Kanisa	Religious	Land
		Fidesu (Fighters Development Sustainability)	NGO	Land & Crops
		Nyamsanze	Nyamsanze	Land

District	Village	Institution Name	Type of Institution	Affected Properties
			village government	
	Katonga	Mtabila National Service Camp	Tanzania People's Defence Force (TPDF)	Land
	Katonga	Mtabila National Service Camp	Underground water pipe infrastructure	Underground water pipes and water sources
	Lugoma	Village government	Lugoma	Land – Football ground
Buhigwe	Kajana	Grazing land	Local government office	Land
	Katundu	Mgogo primary school	Buhigwe District Council	Structure Land & Crops

✓ **Increased level of crime and insecurity**

Crimes and insecurity at construction sites is a common problem. However, during mobilization phase of the project may have a minor negative, short-term effect on the levels of crime and insecurity in the area. The major long -term negative impact of the proposed development could be related to the influx of people during construction and operation phases. During construction phase, more people from different parts of the two countries will be recruited by the project to work at different stage of railway construction. As more people migrate into the area social vices such as crime, theft of construction materials and other properties, alcoholism and sexual laxity/ prostitution are likely to occur, as they are associated with migrant workers living alone, away from their families. These people will become idle and are likely to be forced to steal some of the demolished infrastructure for earning their living.

✓ **Change in Demographic characteristics**

The settlements in the most parts of the project area in Tanzanian side are predominantly rural and therefore their population sizes are generally small with scattered settlements. Given the very small size of most of the communities and concentration of people in Burundi, the influx of workers from other parts of the country during the construction phase will significantly affect the demography of the communities, not just in terms of

population numbers but also in terms of population structure. The latter will be a function of the selective nature of migration which is often dominated by adult male population. Construction activity will no doubt affect the sex ratio of communities for the period the activity is taking place in particular communities. Sex ratio imbalances might be associated with issues like violence against women and sharing of partners which may accelerate the spread of infectious diseases such as HIV/AIDS.

✓ ***Increased accidents, risks and hazards***

Construction of the proposed railway line will include undertaking a number of activities involving mechanical operations of heavy machines and equipment which are susceptible to accidents, risks and hazards. The risks and hazards will also take place during the mobilization phase especially in relation to long howling distances of construction materials from distant burrow/quarry sites.

The high potential areas for accidents, risks and hazards include Rungwe Mpya around the flood plain, Malagarasi River crossing where construction of railway line would involve use of a number of viaducts and extensive bridges. During project operation the risk and hazards will also be associated with oil spills at stations, workshops and bridges which may result in pollution of water and soil.

✓ ***Increased land use conflicts***

The proposed railway line project would acquire substantial amount of land, whereby if not properly done, the land acquisition process could lead to serious land use conflicts. The main sources of conflicts could result from unfair compensation and delayed payments. This impact would be highly significant both in terms of magnitude and duration, and would be irreversible because as long as the land is acquired by the project it will cease to be accessed by the communities. Land use conflicts are also likely to occur due to high demand for land by people who would want to settle along the railway line for agriculture and commercial purposes including seeking for employment.

Another set of land use conflict are likely to result from developments in Uvinza. Although in this project there is no planned development at the current Uvinza station. It is assumed that such developments might be undertaken as part of the ongoing Standard Gauge development of the Dar es Salaam/Kigoma railway. Such developments could include more land take for construction of more railway station infrastructure as well as other public and private infrastructures. As a result, the station is likely to grow rapidly and land could be on high demand, leading to cumulative land use impacts.

✓ ***Change in land values***

The mobilization phase would entail land acquisition. This land is currently used variously by the communities and institutions such as farming, residence as well as social services such as schools and health services. Being a 60 meters wide linear project and covering approximately 156 km long, the impacts would be felt differently along the route. The change in the value of land would be very significant and long term in urban areas than in rural areas.

The project is likely to attract more people along the new railway corridor and thus push demand for land and other resources to higher levels that may not be affordable to many of the local people. Accordingly, the cost of land and essential resources (basic needs) and environmental degradation may be overwhelming and constitute a significant cost element to local communities. Change in land value is also expected due to demand for land near the railway line as several people including railway workers would start grabbing land for investment near the railway line as well as for settlement. This problem is likely to be relatively significant and long term.

✓ **Noise pollution**

During **mobilization and construction phases**, noise levels at project sites and surrounding areas would increase as a result of burrow/quarry activities that are likely to be within or close to human settlements, and construction activities which will involve use of machines and equipment. These may include compaction machines, heavy duty vehicles bringing material at site, concrete mixers, drilling machines, welding machine, iron and timber cutting machines, etc. Thus, substantial noise would result for example when welding, grilling, cutting timber or iron and when vehicles are unloading building materials like sand, gravel, etc. Excessive noise will affect project workers and railway side communities. The noise impact associated with construction work will be short term and will end after construction activities. However, long term impact of noise will be felt during **operation phase** associated with movement of train locomotives particularly to communities residing along the railway corridor.

✓ **Increased risk of HIV/ STDs**

Tanzania has declared HIV/AIDS as a national disaster. The pandemic has affected all sectors of the economy and the war seems to be still very far from ending. During stakeholder's consultations, high proportion of the Uvinza and Kasulu district councils acknowledged the existence of HIV/AIDS.

Construction of railway and its services will increase mobility, migration and interaction of people, communities and nations at large. This is likely to increase transmission of communicable diseases such as HIV/AIDS and other STDs. Given the danger of the diseases it is predicted that the risk is equally high throughout the four phases of the project. It should be noted that this project is not going to bring HIV/AIDS in the districts but that the risk of spreading the disease is quite high as even if one person will be infected that should be a matter of concern.

✓ **Pressure on local social services**

Most of the villages visited located adjacent the railway line did not have adequate services and the situation was generally bad in terms of health services and water services to meet the demand of the existing and the anticipated growing population. Increase in the size of population will put more pressure on existing services to meet demands. Pressure on social services will occur in all phases of the project but will be more significant during the construction phase of the project. Construction and operation

of the railway is associated with accidents, risk and hazards, as a result, social services such as hospitals and water infrastructure need to be adequately available.

✓ ***Pressure on water resources***

Pressure on water resources will arise as a result of increased demand on such a resource from the various people that will be involved in construction works and those that will come to provide services to the workers as well as for railway construction works. The project area has abundant water from rivers and streams crossing the SGR alignment, these are used by local communities for various uses including domestic use. During **construction phases**, water abstraction and use by the project may put pressure on water sources and resources. Such a water problem may occur if the abstraction and use will not take into account downstream users. Paddy irrigation scheme in Rungwe mpya in Kasulu District - Kigoma Tanzania are examples of downstream users who are likely to be affected by the project if appropriately planned abstraction of water will not be in place and followed.

✓ ***Impacts on Occupation Health and Safety***

Common activities undertaken during construction such as the movement of heavy machinery, demolition and excavation, electrical works and works undertaken at height, can all introduce significant risk to the health and safety of the construction work force. Associated risks from accidents and incidents could affect health and safety of the workers and others on construction of stations, sleeper production and batch plants/project sites. Since the location of most of the construction sites would be away from medical centers, improper first aid facilities on the sites could affect health and safety of workers and others.

During the operation of the proposed SGR project will include the physical hazards, chemical hazards and noise physical hazards. Chemical hazards in railway operations and maintenance personnel can be exposed to a variety of physical hazards from operating machinery and moving trains but also working at elevation on bridges and overpasses. Operation of the railway line, which may potentially result in impacts such as the generation of noise and vibration, release of chemicals, fuels or hazardous substances leakage from the freight traffic, killing of crossing animals, generation of various waste streams; and maintenance activities of the trains/track or electrification system, which may potentially result in impacts such as on the occupational health and safety for the workers that will perform regular maintenance of the railway and public safety during the maintenance.

In addition, during operations workers could be exposed to a range of risks and hazardous activities and work environments that could affect human health. Risks and hazards include those associated with the movement of rolling stock, the running and maintenance of the rail engines, and the loading and unloading of materials from the trains. Workers may also be exposed to fumes and chemicals involved in the running of the trains or in maintenance and cleaning. Workers involved in rail maintenance activities may also be exposed to hazards and human health risks comparable to those

involved in construction, as well as the risk of being struck by trains when conducting maintenance activities on or near to the rail line.

✓ ***Impacts on community health and safety***

Community health and safety issues will emerge during the construction of SGR, Uvinza-Kigadye. The impacts will include dust, noise, and vibration from construction vehicle transit, and communicable disease associated with the influx of temporary construction labor. Significant community health and safety issues associated with the proposed project will include pedestrian safety and traffic safety.

Pedestrians and motor cyclists are at greatest risk of serious injury from collisions with moving vehicles. Children will generally be the most vulnerable due to lack of experience and knowledge of traffic related hazards, their behavior while at play, and their small size making them less visible to motorists. Collisions and accidents can involve a single or multiple vehicles, pedestrians or motor cyclists and animals. Many factors contribute to traffic accidents. Some are associated with the behavior of the driver or the quality of the vehicle, road condition (in this case dusty gravel roads) or construction and maintenance issues.

Labor influx for construction of the SGR project is likely to increase risk of communicable diseases and burden on local health services: The influx of people may bring communicable diseases to the project area, including Covid 19, cholera and other sexually transmitted diseases (STDs). Also, incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health resources.

✓ ***Impact on Gender Based Violence and Harassment (GBVH)***

The mobilization and construction phases will involve several activities including land acquisition, recruitment of labour and site clearance. OS 5 emphasize on Non-Discrimination and Equal Opportunity and requires the project proponent not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. It also emphasizes that employment relationship should be based on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship.

○ **Women and Land acquisition**

Land acquisition is one of the most important activities during mobilization phase. Land will be acquired for the construction of embankment for the track, camp sites, borrow pits, dumping sites, quarry sites, stations and access roads. The AfDB Gender policy requires that gender analysis be an integral part of all Bank's interventions to ensure that such interventions respond to the needs and priorities of both men and women. This requirement is based on the premise that the absence of specific attention to differences between women and men has been shown to result in the exclusion of women or men as participants or beneficiaries of planned change.

Based on the baseline study women's right to own and inherit land is one of the central issues related to women's economic empowerment. In Tanzania and in the project area in particular, access to land is critical for food production and income generation and a source of power and social status (SIDA, 2015); in rural areas many women's livelihoods depend almost entirely on their land. While women have the same rights as men, under Tanzanians law, to own and control land, women rarely buy land (UNA Tanzania, 2017). Customary practices in Tanzania often require women to access land through their fathers, brothers, husbands, or other men (Guardian, 2014). Only 24% of Tanzanian women report that they own land alone or jointly with someone, while a mere 9% of women have sole ownership of a house or land (Tanzania National Bureau of Statistics, 2016). In a situation where women have no power to make decision in relation to land ownership, it is likely that the implementation will affect their livelihoods.

- **Child labour and school drop out**

One of the objectives of OS 5 of the AfDB is to protect workers; it is concerned with workers' conditions, rights and protection from abuse or exploitation. It covers working conditions, workers' organizations, occupational health and safety, and avoidance of child or forced labor. The OS 5 requires the client not to employ children in any manner that is economically exploitative, or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development if employed as per respective government provisions. There are procedures to follow to make sure the right of the child will be considered in the project area. Evidence from the ESIA field study show that child labour still persists because children are used in many ways as labour in farming, grazing of livestock, small mining and activities. This limits child's opportunities of go to school and threatens their health. Evidence have also shown that school drop out for primary and secondary school is common along the project area, therefore, if measures to avoid child labour will not be implemented by the project, it is likely that drop out among children will be on increase.

- **Sexual harassment**

The construction industry, particularly of major infrastructure projects, like the proposed SGR project from Uvinza to Kigadye can be a high-risk environment for GBVH affecting community members, workers and service users. GBVH risks can intensify within local communities when there are large influxes of male workers from outside the area. Such workers often come without their families and have large disposable incomes relative to the local community, and can pose a risk in terms of sexual harassment, violence and exploitative transactional relationships. These risks are higher where workers come into close contact with the local community, for example on worker's camp located near settlement neighborhoods. During the construction phase, workers are also vulnerable to various forms of harassment, exploitation and abuse, aggravated by traditionally-male working environments. The Probability of the impact is highly probable as the relative poverty of women and children create conditions in which they could be exploited and harassed.

✓ ***Increasing pressure and encroachment of grazing and pasture land***

As indicated in the socio-economic baseline, livestock keeping is an important economic along the Uvinza to Kigadye SGR project, particularly in Msebei, Rugwe Mpya, Sogeeni Kwiliba, Ruhita, Lugoma, Katonga, Heru Ushingo and Kigadye villages. The livestock keepers use 'rubaga' system where cattle are temporarily moved to search pasture and water during dry season. Such shifts often result into encroachment to the forest reserves and water catchment's areas for major water sources. Construction of track embankment and development associated facilities will pose increasing threat of grazing and pasture land encroachments. Due to construction activities, employment and improved economy of people around the area may influence land speculation and sales. Some of the area that might be very vulnerable to encroached are stock corridors, grazing and pasture lands because of their proximity to the project alignment and stations.

✓ ***Grazing land fragmentation and disturbance***

The SGR alignment and later truck embankment stretches from Uvinza to Kigadye crosses urban and village lands. The land traversed by the project is traditionally used by livestock keepers for different purposes including grazing, stock routes, water points, sacred sites and settlements. Some villages have prepared land use plan which shows designated areas for grazing, agriculture and settlement. Construction of the railway embankment and other associated facilities will interfere and separate communities and resources communally used by livestock keepers.

✓ ***Destruction and contamination of livestock water points***

Construction of embankment from Uvinza to Kigadye will pass through areas occupied and used by pastoralists and other livestock keepers. It will traverse water bodies including rivers, standing water like boreholes and water springs. The construction activities such as excavations, site clearance, vehicles movements and transportation of project materials will have adverse impacts especially destruction and contamination of water points and sources currently used livestock keepers. Some of the key sources of water which are likely to be affected or contaminated include Malagarasi, Ruchugi and Mgera rivers.

✓ ***Vibration pollution***

Mobilization of equipment (**mobilization phase**), construction of access roads and tunnelling (**construction phase**), and transportation of cargo and passengers (**operation phase**) would engage heavy equipment and machines like bulldozers and caterpillars. These activities would be associated with noise and vibration. Ground vibration would be generated either by the static axle loads moving along the track or by the dynamic forces arising from wheel and track irregularities due to project operation, which is likely to continue for many years in the future. The problem is likely to be more severe where the railway is crossing densely populated areas including urban areas where it usually causes subjective discomfort to occupants in nearby buildings or in extreme circumstances, causes damage to buildings or other structures.

✓ ***Change in surface run-off***

Clearance of railway right-of-way (ROW) during mobilization phase) and construction of access roads would directly expose bare soil to surface run-off and erosion (particularly if done during the rains). Such impacts would largely be associated with mountainous areas e.g. around Msebei area, Nyakitonto, Buhoro, Katundu and Kigadye. The impact would largely be residual and could contribute to flush flooding of receiving water bodies during the rainy season.

✓ ***Habitat loss and /or Alteration***

Operational safeguards (OS 3) recognize that the construction and maintenance of railway right of way may result in alteration and disruption to terrestrial and aquatic habitat. The development of Marshalling yard in Uvinza and various stations in Uvinza, Mutinde, Kasulu, and Shunga (border station), and their associated freight yards in will cause loss of habitat and /or cause alteration of habitat particularly in wetland areas (crossing Ruchugi, Mgera and Malagarasi Rivers) and those within protected areas. Similarly, site clearance for the of vegetation for establishing SGR wayleave, construction of marshalling yard, stations and freight yards and associated facilities will remove terrestrial vegetation that are habitats for large to small mammals as well as birds contributing to loss and /or alteration of habitats. Total land area that will be removed from Masanza forest reserve PAs for the purpose of establishing SGR wayleave will be approximately 18000 m² equivalent to 1.8 km².

The loss of habitat and or alteration is considered moderate, with its extent of spread is local and short-term during mobilization and construction phase of the project. The overall impact is considered moderate without mitigation measures and when properly mitigated its impact can be reduced to minor.

✓ ***Damage to/or Alteration of wetland areas***

The sites earmarked for construction of Uvinza-Kigadye SGR as well as associated infrastructures are crossing wetland areas. Three important wetlands are crossed by the proposed SGR project; Rungwe mpya River, Ruchugi River and Malagarasi River. These wetlands are home to aquatic life. Site clearing activities taking place during mobilization and movement of machines and vehicles within the site will likely drain the wetland and damage and /or alter the habitat characteristics of these sites. Also, during construction of b ridges and culverts crossing these wetlands may cause alteration of some of the wetlands and disrupt their ecological functions. Impact evaluation has considered the intensity of damage to wetland by the project as high given the size of wetlands to be crossed and the numbers. The extent of spread for Malagarasi wetland is trans boundary while impact on Ruchugi and Rungwe mpya River may have impacts felt up to the lake thus affecting trans boundary lake. Therefore, implementation of construction activities may permanently alter wetland habitats. The probability of occurrence for alteration and damage to wetland habitat during mobilization and construction phase is definite permanent and irreversible but the risk is rated as high due to the size impacted and its effects being trans boundary.

✓ ***Biodiversity loss***

Loss of biodiversity will result from cumulative impacts of site clearing, habitat fragmentation, habitat loss and /or alterations and spread of invasive species and direct kills from trampling and accidents. Biodiversity loss resulting from mobilization works on chosen sites for construction of the SGR Uvinza –Kigadye. The alignment crossing Masanza forest reserve, wetlands at Ruchugi River, Rungwe mpya and Malagarasi have proved to harbour significant population of fauna as described in baseline condition. Significant loss to biodiversity will also contribute to loss of species recognized by IUCN as vulnerable. Masanza forest reserve has records of elephants visiting during wet season from Uvinza Ranch connected to Muyowozzi game reserve. Elephants (*Loxodonta africana*) (EN), Leopards are vulnerable (VU) Giant Pangolin *Smutsia gigantea* (EN), Zebra *Equus burchellii* (NT), Lion *Panthera leo* (VU), and Spotted Hyena *Crocuta Crocuta* (V) under IUCN were recorded thus, triggering OS 3 and PS 6 criterion 1 to 3. Similarly plant species with conservation status such as *Pterocarpus tinctorius* CITIES III, *Dalbergia melanoxylon* (NT, CITIES II), *Polystachya setifera* (EN) were recorded. Biodiversity loss resulting from construction of Uvinza – Kigadye was evaluated to be moderate with local extent of spread and long-term.

✓ ***Risk of increased spread of Invasive Alien Species Infestation***

Risk of spread of invasive species is likely to be a significant impact on Uvinza – Kigadye SGR construction work involving collection of construction materials from different sources identified some of which are likely to be on farmlands, grazing areas and others close to settlement areas already affected by different types of invasive species. Site visit and literature survey recorded a number of invasive species within the project areas, the most recorded invasive species is *Leucaena leucocephala* a tree species used as fodder for livestock, *Lantana camara*, *Argemone Mexicana* and *Opuntia vulgaris*. Construction work involving movement of vehicles and machines from one locality to another will contribute to spreading of these invasive species and others into areas that are less infested. Invasive species tends to dominate other plant species creating mono-dominant species which in turn affect biodiversity. Impact evaluation characterizes risks of spread of invasive species as low during mobilization, with extent of spread being local and short term since the species was recorded in few localized areas.

✓ ***Deforestation and habitat fragmentation***

Construction of railway project in identified locations will cause deforestation and habitat fragmentation resulting from vegetation clearance. As noted in the baseline condition section the project area traverses in well vegetated area with significant number of protected areas. The first 3 km of the corridor runs through Masanza forest reserve which is contiguous with Mkuti north and Lugufu northwest of Masanza. South of the zero km for the Uvinza –Kigadye line is the Uvinza south forest reserve. The presence of the reserves in the areas makes the uvinza zone a critical habitat analysis site as discrete management unit (DMU). These forests are characterized by miombo woodland forming falling under transition between Zambezian regional centre of

endemism and Guinea – Congolese centre of endemism which are part of the Greater African Subequatorial Savannas & Mixed Woodlands (AT11). Vegetation clearing in these areas will deforest the area and cause habitat fragmentation. Deforestation and habitat fragmentation caused by establishment of named facilities will add to already fragmented forest caused by ongoing clearance for farming, establishment of settlement and grazing area and charcoal burning. Clearance of the vegetation in once continuum habitat will fragment and isolate species benefiting from continuum habitat and making them vulnerable to extinction.

✓ ***Risk of interference of wildlife movement corridors***

Risk of interference with wildlife movements will be a significant impact for Uvinza – Kigadye SGR as the alignment and Mutinde station are located in area where wildlife movement and crossing was noted. The area between Basanza villages to Kaguruka was identified as potential elephant crossing corridor. Elephants from Muyowozi game reserve moves into Uvinza wildlife ranch moves across the railway corridor into Mkuti forest-Lugufu and Masanza forest reserve. Construction of various components of the project will interfere and possibly blocked wildlife movement across the project area. Location of Uvinza –Kigadye SGR separates Uvinza wildlife ranch which connects to Muyowozi Game reserve on the eastern side and Mkuti, Lugufu and Masanza forest reserves on the western side. Since the SGR corridor will be fenced it will block elephants from movement between named protected areas. The impact significant is rated as major without mitigation measures, however with implementation of proper mitigation measures the impact can reduced to moderate

✓ ***Loss /reduction of Ecosystem Services***

OS 3 recognizes that loss of ecosystem services and /or access to ecosystem services valued by human emphasizes loss of biodiversity resources. Implementation of construction of Uvinza-Kigadye SGR on identified locations contributes to clearing of vegetation that offer habitat service to fauna species, denies grazing ground, provide sources of firewood and construction materials to the local communities residing along the SGR corridor. Baseline analysis revealed that large part of the project area is well covered by vegetation ranging from miombo woodland, open grassland, wetland to farmlands. Presence of natural habitats like miombo woodland which have confirmed to harbor abundant wildlife as presented in baseline section. Similarly baseline survey has noted local community benefiting from different types of ecosystem services, firewood collection, construction materials (bamboo), fishing, rids harvesting, grazing, charcoal burning and farming on wetlands and other natural areas acting as source of livelihood. Significant numbers of beekeeping farming which depends solely on the forested areas around the community were noted near Mati Mubondo, Masanza, Kaguruka and Rungwe mpya. Vegetation clearing for establishing of SGR will affect ecosystem services along the SGR corridor benefiting the communities. The impact significant is rated as moderate without mitigation measures; however with implementation of proper mitigation measures the impact can reduced to minor.

✓ ***Soil erosion***

Soil erosion is expected almost during all phases of the project (i.e. mobilization, construction, operation and decommissioning). Site clearance, removal of soil overburden, actual embankment construction, cut and fill section of the rail, crossing rivers, streams, steep slopes and especially on escarpment as well as management of workers camp will trigger erosion and siltation of receiving water bodies. Significant erosion will occur when construction is done on the mountain slopes because of the steep gradient and unconsolidated soils, especially if construction is done during the rainy season. The section between Msebei to Sogeeni kwiliba, Mutabila Military area, Buhoro, Katundu, village and toward the border with Burundi the hilly terrain characterizing the corridor will result into significant soil erosion.

✓ ***Change in landscape and scenic quality of the area***

Implementation of various activities of the project along the railway corridor will contribute to change in landscape and scenic quality of the area. activities like clearing of vegetation along the corridor, cut and fill section on slopes and river valley, extraction of construction materials, establishment of access roads, accumulation of overburden and damping of spoil soil materials will contribute to change in the scenic and landscape of the project area.

✓ ***Air pollution and contribution to climate change***

The main contributor to climate change related to this project is air pollution emanating from emission of greenhouse gases (GHG) from operating engines and machines during both construction phase of the project. However, significant reduction of (GHG) emission will occur during operation phase as the project will be electrified thus cutting down substantially GHG. Intensification of agriculture and mining activities stimulated by improved infrastructures/ transportation will reduce the vegetation cover that would help sequester GHG generated to counteract the generation levels.

✓ ***Damming/Ponding effect***

The construction of railway embankment particularly on low-lying and flood prone areas will create a ponding effect as the embankment will create a barrier to otherwise free flowing water. Creation of barrier for free moving water will cause damming effect and flooding on the water receiving side of the embankment. Associated with damming effect is the bullet effect caused by retained water forcing their way out of the small culvert, as a result the force created by water erode the emptying side of the embankment.

✓ ***Disruption of road and public utilities/infrastructures***

Construction of railway embankment and other railway infrastructure like communication system will disrupt existing infrastructure such as water system, telecommunication, optical cable, power transmission and sewerage system especially in urban setting. The

most significant impact will be felt during construction phase of the project and cause serious inconveniences to local communities.

✓ ***Liquid waste generation***

Substantial liquid wastes would be generated during all phases of the project (**mobilization, construction, operation and decommissioning**). Generated liquid wastes shall include domestic waste from offices, working station, working camps and passengers in the train and train stations. Also, hydrocarbon waste from lubricants, waste fuel, oil and grease washed from train, maintenance depots and re-fuelling will add to the liquid waste generated during various phase of the project. Generally, wastewater constitutes about 80% of amount water consumption; thus,

✓ ***Solid waste generation***

Solid wastes generated from site clearance would generate large quantities of woody vegetation biomass and top soil overburden. Additional solid wastes would include garbage (food wastes), rubbish (paper, cardboards, wood, tree leaves and branches, bottles, metals, plastic materials, drums, containers, construction materials, packaging materials, iron scrap material, absorbable pads and oil sags). Others are medical or clinical wastes from first aid and health facilities including medical related wastes. These solid wastes need to be handled properly not to cause harm to human and environment.

✓ ***Surface water and soil pollution***

Physical impacts like increased turbidity due to increased sediment load will result from mobilization and construction activities. Similarly, during operation phase of the project water and soil pollution will come from possible leakage, or spillage of Hydrocarbon waste from lubricant of the machine, waste fuel, oil and grease.

✓ ***Increased accidents, risks and hazards***

Number of activities involving mechanical operations of heavy machines and equipment are likely to create accidents, risks and hazards. The risks and hazards will also take place during the mobilization phase especially in relation to long haulage distances of construction materials from distant burrow/quarry sites. The high potential areas for accidents, risks and hazards include Rungwe Mpya, Basanza, Nyakitonto, on flood plains and River crossing (Malagarasi, Ruchugi, Mgera) where construction of railway line would involve use of a number of viaducts and extensive bridges.

Stakeholder engagement

The Constitution of the United Republic of Tanzania of 1984 Act No. 15 Art. 6 as amended in the Act No. 34 of 1994 Art.4 puts in front Freedom to participate in public affairs. It emphasizes that every citizen has the right and the freedom to participate fully in the process leading to the decision on matters affecting him, his well-being or the nation. Also, section 89 of the Environmental Management Act Cap 191, provides directives on public participation issues. Section 17 of the EIA and Audit Regulations

(URT, 2005) provides further details and procedures for public participation in the ESIA process. Furthermore, AfDB's Operational Safeguard 1 on Environmental and Social Assessment stresses on the need to Provide for stakeholders' participation during the consultation process so that affected communities and stakeholders have timely access to information in suitable forms about Bank.

The purposed of the stakeholder engagement plan is to provide meaningful stakeholder engagement throughout the project cycle. It is an essential aspect of good project management and provides opportunities to:

- Provide project related information and materials to affected and interested parties;
- Solicit feedback from stakeholders to inform project design, implementation, monitoring, and evaluation;
- Enhance project acceptance by clarifying project objectives and scope at a an early stage and manage stakeholders' expectations;
- Assess and mitigate project environmental and social impacts and risks; • Enhance project benefits;
- Address project grievance;

During the ESIA process, stakeholders from all levels (national, local government and residents in the project affected area) were consulted and views were sought through interviews, group discussions and a number of public meetings. The Uvinza to Kigadye SGR Project Stakeholder's consulted include:

Government officials at Ministerial, Regional, Districts, Wards and Village level

- a) Ministry of Works and Transport (MoWT)
- b) Ministry of Finance and Planning (MoFP)
- c) Kigoma Regional Secretariat
- d) Uvinza District Council
- e) Kasulu Town Council
- f) Kasulu District Council
- g) Buhigwe District Council
- h) Wards and Village Offices

At the district level, various relevant Officials were consulted, including

- a). District Commissioners,
- b). District Executive Directors,
- c). District Land Officers,
- d). District Natural Resource Officers,
- e). District Land Officers,

- f). District Environmental Officers, as well as the offices of the District Engineer and District Community Development Officers.

Government Parastatals

- Tanzania Railways Corporation (TRC)
- TANROADS HQ Office
- TANROADS Kigoma Regional office
- TARURA District offices
- TANESCO District Office
- RUWASA District Offices
- Tanzania Forest Service Agency
- Lake Tanganyika Water Basin Authority
- De Paul Mission School
- Ruchugi Secondary School
- Katundu Secondary School

Various NGOs and CBOs such as

- Tanzania Track Owners Association (TATOA)
- Kikundi Cha Maarifa na Taarifa Kasulu (GBV-NGO)
- Endeleva Wazee Kigoma (EWAKI)
- Tanzania Chamber of Commerce, Industry and Agriculture (TCCIA) College and Institute Canada

• Summary of findings

The Uvinza to Kigadye SGR Project Stakeholder Consultation encompasses three groups of stakeholders, which include, first, at national, regional, district, wards and affected villages, second, government parastatals and thirdly, various NGOs and CBOs and parastatals. The first Stakeholder Consultation Meeting was held between 31 May 2023 to 22 June 2023 at various locations and the total of seven ministries, regional and districts offices were consulted and views, comments and inputs received. The ministries regional and district authority's stakeholders meeting was held at their respective offices. While the local project affected people meeting was organized at village level with support and directives from the District Executive Directors where a total of twenty-two (22) village's leadership in attendance. The village public meeting provided a wide platform for all the relevant stakeholders to raise their concerns, highlight the project related environmental, social, and economic and risk impacts and issues of significant. The total of 1,291 persons attended the consultative meeting, among them 887 were males and 346 were females.

Issues and concerns articulated during the stakeholder meetings

The major issues highlighted during the meeting are summarized below:

- The project is important to the local communities where the railway traverse, nation and regional integration

- The leadership is in support of the proposed project
- Employment opportunities to the project affected people
- Timely and fair compensation to the affected properties
- Issues on forest resources, wildlife habitats and corridors
- That the selection of project communities be done in consultation with project communities at local level.
- Avoid involuntary resettlement and if avoidance is impossible, compensate for private properties affected by the project.
- Government should incorporate the local people into every aspect of the project development and implementation. .
- The proposed alignment traverse in villages which has land use plan. The developer has the responsibility to fund the preparation of other land use plan.

Grievance mechanism

A grievance redress mechanism has been developed for potential use by all interested stakeholders. The aim of the grievance mechanism is to achieve mutually agreed resolution of grievances raised by such stakeholders. This grievance mechanism ensures that complaints and grievances are addressed in good faith and through a transparent and impartial process, but one which is culturally acceptable. Grievances raised by stakeholders need to be managed through a transparent process, readily acceptable to all segments of affected communities and other stakeholders, at no cost and without retribution. The grievance mechanism should be appropriate to the scale of impacts and risks presented by a project and beneficial for both a proponent/operator and stakeholders, especially the PAPs.

Institutional arrangements

Tanzania Railways Corporation (TRC) is the main PIE with overall responsibility for ensuring that the Project is fully implemented by taking into account Employer's Requirements (i.e., TRC) as well as national and the Lenders' requirements and standards (i.e., in this Uvinza-Kigadye SGR, the lender is the African Development Bank-, AfDB) as well as other applicable international conventions and standards for railway construction.

TRC is mandated to implement railway construction and operation in Tanzania through the Railway Act, 2017 that created TRC and guides the development, maintenance and promotion of the railway infrastructure, rail transport services and related matters. The Act give powers to TRC to build railway infrastructure and superstructure, acquire, hold, and alienate movable and immovable properties and operate a railway system by making sure it is safe, maintained and sustainable.

- **Project Alternatives**

Several alternatives were assessed throughout this ESIA process, these alternatives provide the bases of making better choice for the sustainability of the railway line and benefit to the national and local communities. Details of each alternative are provided in the main document while this section summarizes them including the “No project” alternative.

- ✓ **The “No Project” Alternative**

This alternative refers to the option of not undertaking the proposed railway construction project or any of its other alternatives. Adopting this option would surely avoid most of the negative effects associated with the project but also will lose many benefits. Adopting this alternative means the railway link from Uvinza (Tanzania) to Musongati (Burundi) would not be constructed, making it impossible or difficult to exploit the nickel deposits at Musongati area, and fail to open up the landlocked Burundi to regional and international trading via the Dar es Salaam (Tanzania) port. More importantly, the option would mean continuation of the people’s hardships and poor regional development. In conclusion, the ‘no project’ alternative is not acceptable, and the proposed railway development project should prevail.

- ✓ **Station Location Alternatives at Kasulu**

The initial proposed location of the railway line was interfering with the proposed trunk road bypass, which aimed at avoiding traffic congestion in Kasulu town centre. The Town council is also proposing to locate the main bus stand along this road bypass and therefore the original railway line alignment would also affect the planned main bus stand.

To avoid the proposed railway line interfering with the proposed bus stand, it is now decided that the railway line be shifted about 2.5 km to the east, so that the railway station is linked to the existing access gravel road which is also the proposed access road to the bus stand and the town centre. Regarding the Tanzania/Burundi border station the ESIA team is discouraging a joint and single-entry facility at the border for political and security reasons and is recommending two separate stations, one on the Tanzania side and another on the Burundi side.

- **Environmental and Social Management Plan**

The Environmental and Social Management Plan (ESMP) outlines mitigation and enhancement measures addressing all predicted significant negative and positive impacts as per the ESIA report. The ESMP requires the developer to implement mitigation and enhancement measures for predicted impacts and demonstrate compliance to environmental standards relevant to Tanzania and/or as adopted from international organizations. The cost of mitigation/enhancement is about **USD 1,135,000**. However, there are other costs that have not been determined and need to be considered.

Environmental monitoring plan

Introduction

The primary object of environmental monitoring is to ensure that mitigation measures are implemented and the potential negative impacts are reduced, minimized to acceptable levels. The primary objective of the Uvinza Kigadye SGR Monitoring Plan includes the following:

To assess the changes in environmental conditions

To assess performance and the effectiveness of the mitigation measures adopted

To determine project compliance with regulatory requirements and adopt remedial action

To identify potential gaps and promptly implement corrective measures

Scope of monitoring

The project monitoring scope is divided into two main phases namely;

1. Impact detection monitoring which includes periodic sampling to assess the impact of project construction and operations on the environment and human health, and to ensure progress towards minimizing project's negative impact.

2. Compliance monitoring is conducted to ensure that all project and sub-project activities are in full compliance with the Environmental Protection Agency regulations and standards as per National standards and financier requirements in this case AfDB operational safeguards (OS).

Monitoring parameters

The receptors required for monitoring includes:

- a. Air Quality
- b. Water Resources
- c. Occupational Health and Safety
- d. Noise and vibration Quality
- e. Soil Quality
- f. Waste Generation & Management
- g. Landscape and Visual
- h. Biodiversity
- i. Resettlement
- j. Livelihood restoration

Summary Table for monitoring sensitive receptors are presented in Table 9-1

Decommissioning

The proposed railway line project constitutes activities such as construction of workers camp, excavation and delivering construction materials, construction of access roads and related infrastructures. So far, the developer of the project has not set a specific time for the decommissioning of the project. There will be some components of the project that will be closed as soon as their requirement has come to an end.

For example, closing temporally workers camp after construction, closing quarry sites, barrow pits as well as access roads after construction or work in the area and eventual decommissioning of the whole railway infrastructures after the end of lifespan or other factors have necessitated that to happen. Several impacts (negative and positive) are likely to occur as result of the decommissioning. The ESIA report discusses the implications of decommissioning of the proposed development and suggests mitigation measures to deal with impacts.

Costs related to the project

The estimated cost for the construction of the proposed Uvinza – Kigadye railway project is about **1.45 billion USD**. The estimated costs for implementing enhancement measures, mitigation measures as well as monitoring process i.e., environmental and social management plan and environmental and social monitoring plan are **USD 2,630,704.61¹** and **USD 2,130,000²** respectively as discussed in Chapters 8 and 9 of this report. These estimated costs for mitigation or enhancement measures does not include the full environmental costs, which could not be accurately calculated. Since some of the impacts will only to be realized during construction phase, the costs for these will also be short term, especially if mitigation measures are fully implemented.

Conclusions and Recommendations

The implementation of the proposed railway with associated infrastructures represents a significant infrastructure development linking Burundi (a land locked country) to Tanzania (with harbours to the Indian Ocean). The project will have several significant positive impacts including contribution to regional integration, regional business, and ease of transportation of massive cargo from various potential mining areas in Burundi

¹ This cost includes US\$ 1,495,704.61 proposed as cost for compensation as indicated in the RAP Report for Uvinza – Kigadye SGR Project (TRC, 2023).

² This figure includes cos for RAP Performance Monitoring as the RAP Report for Uvinza – Kigadye SGR Project (TRC, 2023).

and agricultural potentials of western Tanzania. The ESIA statement has also pointed out to several negative impacts likely to occur following the implementation of various project activities. Such impacts include loss of land and other public and private properties. Correspondingly, a set of enhancement and mitigation measures have been recommended, followed by environmental and social management and monitoring plans.

The costs for implementing mitigation and monitoring plan have also been prepared together with responsible institutions and the timeframe for implementing various corrective measures. The ultimate goal is to enhance the foreseen benefits that the proposed project will produce environmentally, socially and economically. However, to realize the benefit from the railway infrastructure development, the mining sector, industrial development and agriculture sector in Tanzania, Burundi and other nearby countries of Rwanda and DRC Congo need to be performing well.

The ESIA therefore ***recommends that the proposed development should be considered for development as it meets the relevant policy objectives and will provide services to the communities in both countries and stimulate other sectors of development.*** However, the proposed mitigation and enhancement measures recommended in this ESIA must be implemented to ensure that project benefits are realized or optimized.

MUHTASARI MAHSUSI

Usuli wa Mradi na Mantiki

Serikali ya Jamhuri ya Muungano wa Tanzania (GoT) kupitia Shirika la Reli Tanzania (TRC) inaendelea na ujenzi wa reli ya kisasa ya kisasa (SGR) inayotumia umeme nchini kote. Mradi wa SGR unatekelezwa kwa awamu, ambazo zinajulikana kama "Mengi". Kipande cha kwanza (Dar es Salaam hadi Morogoro) na kipande cha pili (Morogoro hadi Makutupora) zina urefu wa takriban kilomita 541. Sehemu ya SGR kipande cha tatu (Makutupora hadi Tabora) ina urefu wa kilomita 294 na kipande cha nne (Tabora hadi Isaka) ina urefu wa kilomita 130. Sehemu ya 5 (Mwanza hadi Isaka) inashughulikia takriban kilomita 237 za njia kuu. Ujenzi wa Sehemu hizi (yaani, Sehemu ya 1 hadi Sehemu ya 5) unaendelea. Mkataba wa SGR kipande cha sita, Tabora hadi Kigoma umesainiwa na taratibu za kuanza kazi zimeanza. Kazi ya maandalizi ya ujenzi wa mradi wa SGR kutoka Uvinza hadi Kigadye wenye urefu wa kilomita 156.4 unaendelea kupitia wilaya za Halmashauri ya Wilaya ya Uvinza, Halmashauri ya Mji wa Kasulu, Wilaya ya Kasulu na Wilaya ya Buhigwe mkoani Kigoma.

Mkataba wa Afrika Mashariki unaunga mkono ushirikiano wa kikanda na maendeleo ya kijamii na kiuchumi. Ili kufanikisha hili, pia inasisitiza haja ya kuratibiwa, kuwianishwa, na sera za ziada za usafiri; uboreshaji na upanuzi wa viungo vilivyopo; na kuanzishwa kwa mpya ili kuimarisha mshikamano wa kimwili wa nchi wanachama na kuwezesha biashara ya ndani ya kikanda na muunganisho wa kimataifa. Ushirikiano huo utapunguza vikwazo na vikwazo katika mnyororo wa thamani, kuboresha muunganisho kwa urahisi wa usafirishaji wa bidhaa na huduma, kuongeza thamani ya uchumi wa kikanda na kuwezesha uchumi wa kikanda wenye ushindani ambao utavutia uwekezaji katika kanda, na hivyo kukuza ukuaji wa uchumi. kama ajira na hatimaye kupunguza umaskini.

Mradi wa SGR wa Uvinza-Kigadye unajumuisha sehemu muhimu ya ukanda mpya wa biashara wa kimataifa kutoka njia ya reli ya kati ya Tanzania inayounganisha Uvinza na eneo la uchimbaji madini huko Musongati, Burundi. Madhumuni ya SGR ya Uvinza-Kigadye ni kuunganisha eneo la uchimbaji madini karibu na Musongati na biashara ya kimataifa, kupitia bandari ya Dar es Salaam. Pia itaunganisha DR Congo kupitia pendekezo la upanuzi wa SGR kutoka Gitega hadi Kindu nchini DRC. Kulingana na utafiti ulioidhinishwa na Benki ya Maendeleo ya Afrika (AfDB) mwaka 2009, Burundi ni miongoni mwa nchi 10 duniani ambazo zina akiba muhimu ya madini ya nikeli, kobalti, shaba, chuma na platinamu, nyingi kati ya hizo bado hazijatumika. Malipo muhimu zaidi ni ile iliyopo Musongati yenye takriban tani milioni 185 za nikeli. Eneo hili la uchimbaji madini linahitaji muunganisho wa uhakika wa usafirishaji wa mizigo na abiria wenye uwezo wa kutosha hadi njia ya reli ya kati nchini Tanzania. SGR inayopendekezwa inatarajiwa kuunganishwa na laini mpya ya SGR kutoka Tabora hadi Kigoma katika Wilaya ya Uvinza. Hata hivyo, Musongati nchini Burundi si sehemu ya TAM hii ingawa SGR inapitia Wilaya za Uvinza na Kasulu nchini Tanzania hadi Musongati nchini Burundi. TAM hii inahusu mradi wa SGR uliopo Tanzania pekee wakati TAM kwa upande wa Burundi wa SGR imetayarishwa na Burundi.

Mradi huu unategemea Kuegemea, Upatikanaji, Udumishaji na Usalama (RAMS) kama hitaji la msingi la Miundombinu na mifumo yote inayoruhusu kuongeza kasi ya usanifu ya kilomita 160 kwa saa kwa treni za abiria na ya kilomita 120 kwa saa kwa treni za mizigo. Usanifu na ujenzi utazingatia miongozo ya kitaifa na kimataifa juu ya ulinzi wa mazingira na kijamii.

Malengo ya Mradi

Lengo kuu la Mradi wa SGR ni kutoa usafiri bora na endelevu kwenye ukanda wa kati wa Tanzania na kufufua sekta ya usafiri wa reli ili kuchangia katika uchumi wa taifa na kikanda. Kwa sasa, zaidi ya asilimia 90 ya mizigo inayotoka katika bandari ya Dar es Salaam inasafirishwa kwa njia ya barabara, hivyo kusababisha gharama kubwa za matengenezo na viwango vya juu vya utoaji wa gesi joto (GHG). Kwa hiyo, SGR kutoka Dar es Salaam hadi Mwanza, Kigoma na Kigadye zitaongeza uwezo wa mizigo na abiria na kupunguza usafiri wa barabarani, hivyo kutoa shinikizo kwenye mtandao wa barabara na kupunguza GHG. Pia itachangia katika kutoa muunganisho wa nchi zisizo na bandari za Burundi, Rwanda na Jamhuri ya Kidemokrasia ya Kongo (DRC) na kutoa fursa kwa nchi hizo kwenye bandari za Tanzania. Malengo makuu ya mradi ni pamoja na:

- a) kuendeleza mfumo wa usafiri wa reli unaotegemewa, wa gharama nafuu, bora na usio na imefumwa hadi Burundi na DRC kutoka pwani ya Bahari ya Hindi.
- b) kutoa huduma bora na nafuu za usafiri, kukuza biashara, ushirikiano wa kiuchumi wa kikanda na maendeleo ya madini, viwanda na biashara ya kilimo ndani ya eneo la ukanda.
- c) kuongeza usalama wa usafiri na ulinzi wa mazingira.
- d) kuruhusu ushirikiano na njia mpya za reli kwa viwango vya kisasa, na
- e) kuongeza kasi ya reli na uwezo wa kubeba mizigo zaidi ya njia ya reli iliyopo

Tathmini ya Athari kwa Mazingira na Kijamii (TAM)

Kulingana na Sheria ya Usimamizi wa Mazingira (EMA) 2004 na Usimamizi wa Mazingira (Tathmini na Ukaguzi wa Athari kwa Mazingira) (Marekebisho) Kanuni za (2018), hakuna shughuli yoyote ya maendeleo ambayo inaweza kusababisha hatari na athari za kimazingira na kijamii itaruhusiwa kuendelea bila kupata cheti cha mazingira kutoka kwa mamlaka husika. Maombi ya EIA yametolewa chini ya Kanuni ya 4 (A) ya Kanuni za Usimamizi wa Mazingira (Tathmini na Ukaguzi wa Athari kwa Mazingira) (Marekebisho), 2018 ambapo, kwa kuzingatia ukubwa wa hatari na athari kwa mazingira na kijamii, miradi imeainishwa katika makundi ma nne ambayo ni Aina ya "A" kwa ajili ya miradi ya lazima ya TAM; kundi la pili "B1" kwa miradi ya mipaka; kundi la tatu "B2" kwa miradi isiyo ya lazima, na kundi la miradi maalum.

Mradi wa SGR wa Uvinza -Kigadye unahusu ujenzi wa njia za reli nchini Tanzania na uko chini ya miradi ya kitengo A. Miradi ya Kundi A ni ile inayo uwezekano wa kuwa na hatari na athari mbaya za kimazingira na kijamii na kwamba uchunguzi wa kina

unahitajika ili kubaini ukubwa, kiwango na umuhimu wa hatari na athari na kubainisha hatua zinazofaa za kupunguza kabla ya mradi kuruhusiwa kuendelea. kwa ujenzi.

Kwa kuongezea, mradi huo uko chini ya mahitaji kadhaa ya kimataifa ikiwa ni pamoja na Benki ya Maendeleo ya Afrika (AfDB), ambayo ina uwezekano wa kufadhili ujenzi wake. AfDB inabainisha umuhimu wa (i) tathmini jumuiishi ili kutambua athari za kimazingira na kijamii, hatari na fursa za miradi; (ii) ushirikishwaji mzuri wa jamii kupitia ufichuzi wa taarifa zinazohusiana na mradi na mashauriano na jumuiya za wenyeji kuhusu masuala yanayowahusu moja kwa moja; na (iii) usimamizi wa mteja wa utendaji wa kimazingira na kijamii katika maisha yote ya mradi. Kulingana na Tamko la Sera na Ulinzi wa Mfumo wa AfDB wa Mfumo Jumuiishi wa Ulinzi -Tamko la Sera na Ulinzi wa Uendeshaji, mradi wa SGR wa Uvinza -Kigadye unaopendekezwa uko chini ya mradi wa Kitengo cha 1, ambao ni miradi Uendeshaji wa Benki unaweza kusababisha athari kubwa za kimazingira na kijamii, ambayo TAM ni ya lazima.

Malengo ya Tathmini ya Athari kwa Mazingira na Kijamii (TAM)

Madhumuni ya TAM hii ni kuhakikisha kwamba hatari na athari zinazoweza kuhusishwa na Mradi zinatarajiwa na kushughulikiwa mapema wakati wa hatua ya kupanga na kubuni mradi. Matokeo ya tathmini katika hatua tofauti yatawasilishwa kwa timu ya upembuzi yakinifu na kubuni ili kuhakikisha kuwa inazingatiwa katika mchakato wa kubuni. Inatarajiwa kwamba mpangilio huo wa upangaji na usanifu utachagiza mradi ili manufaa yake yaweze kupatikana na kudumu bila kusababisha matatizo ya ghafla.

TAM hii ilifanywa kama matakwa ya Kanuni za Usimamizi wa Mazingira (Tathmini na Ukaguzi wa Athari kwa Mazingira) (Marekebisho) za 2018 na ilifanyika kwa mujibu wa Sheria na Masharti (ToR) iliyoidhinishwa na Baraza la Taifa la Hifadhi na Usimamizi wa Mazingira iliyoandaliwa wakati wa utafiti wa awali na imekidhi mahitaji ya Benki ya Maendeleo ya Afrika. Malengo ya jumla ya TAM hii ni pamoja na yafuatayo:

- Kuhakikisha uzingatiaji wa kanuni, miongozo na sera za kitaifa;
- Kuchambua athari zinazoweza za kimazingira za mradi kwa kuzingatia masuala muhimu mtambuka ikiwa ni pamoja na mazingira ya kibiolojia, jinsia, mabadiliko ya tabianchi na ulinzi wa kijamii;
- Tambua wadau wa mradi, ikiwa ni pamoja na walengwa wakuu wa mradi ambao wanaweza kuathiriwa vyema au vibaya na mradi;
- Tathmini athari za moja kwa moja au zisizo za moja kwa moja za Kimazingira na Kijamii za mradi na kupendekeza hatua za kukabiliana na athari hasi na hatua za kuimarisha athari chanya;
- Amua utangamano wa mradi na mazingira yanayozunguka;
- Tathmini uwezekano wa hatari za mabadiliko ya hali ya hewa na kupendekeza hatua za mabadiliko ya hali ya hewa kwa mradi;
- Kujumuisha mipango ya usimamizi wa mazingira na taratibu za ufuatiliaji wakati wa awamu za ujenzi na uendeshaji wa mradi;
- Thibitisha ikiwa mradi au sehemu zake zozote na shughuli zitaanzisha makazi mapya bila hiari;

- Kutoa njia kamili za kutatua Malalamiko zinazofaa kitamaduni na zinazoweza kufikiwa -GRM;
- Toa ushahidi wa mashauriano ya washikadau (orodha za kina za washiriki walio na mawasiliano;
- Kutoa mpango wa gharama nafuu wa usimamizi wa mazingira na kijamii ikiwa ni pamoja na mpango na viashiria vya kutumika kwa ajili ya ufuatiliaji wa ufanisi wa hatua za kupunguza, na
- Tengeneza data ya msingi ambayo itatumika kufuatilia na kutathmini hatua za kupunguza zinazotekelezwa wakati wa mzunguko wa mradi.

TAM ilibainisha na kutabiri matokeo au athari zinazoweza kutokea za Mradi zinazohusiana na mazingira ya kimwili, kibaolojia, kijamii, kiafya na kiuchumi kwa jamii ya karibu na idadi kubwa ya watu kwa ujumla. Ilikagua jinsi Mradi unavyoweza kusababisha madhara kwa watu, mali zao na maisha na kuzingatia manufaa yanayoweza kupatikana kutokana na Mradi ambayo yataongeza fursa za uhifadhi wa mazingira, ukuaji wa uchumi, ajira na kupunguza umaskini ili kufikia maendeleo endelevu.

Baada ya kutabiri matatizo na fursa zinazowezezekana, TAM ilibainisha hatua za kupunguza matatizo na kuimarisha fursa na kuainisha njia za kuboresha uendeleu wa Mradi.

Mawanda ya Utafiti

Mawanda ya TAM hii yalikuwa ni kueleza hali ya kimazingira na kijamii ya eneo la mradi lenye ushawishi, kutambua athari za kimazingira, kijamii na kiuchumi na manufaa ya mradi, kupendekeza hatua za kupunguza, ufuatiliaji na mipango ya usimamizi, na kutoa maoni na maoni ya umma husika. kwa maendeleo na utekelezaji wa mradi.

TAM ilishughulikia vipengele vifuatavyo:

- Kupitia nyaraka na maandiko husika kuhusiana na Mradi
- Kuandaa mpango wa ushirikishwaji wa wadau ikijumuisha majukumu na wajibu na kujumuisha jinsia na makundi yaliyo katika mazingira hatarishi;
- Kuandaa utaratibu wa kutambua athari zinazoweza kujitokeza kimazingira na kijamii za shughuli mahususi, na hatua za kushughulikia na kudhibiti athari hizi;
- TAM inapaswa pia kujumuisha mipangilio ya kitaasisi na taarifa kuhusu wakala au wakala wanaohusika na kusimamia athari za mradi; juu ya ufuatiliaji wa utendaji wa mkandarasi;
- Kufichua TAM kwa washikadau wote wanaovutiwa na kukaribisha maoni na mapendekezo yao juu ya upeo na utoshelevu wa tathmini inayopendekezwa, kupunguza na kuongeza manufaa.
- Kuingiza maoni katika rasimu ya waraka wa TAM kutoka kwa wadau wakiwemo TRC na AfDB na kuandaa ripoti ya mwisho kwa ajili ya kuwasilishwa Baraza la Taifa la Hifadhi na Usimamizi wa Mazingira.

• Mbinu na Mbinu za Utafiti

•Mtazamo wa TAM hii uliongozwa na miongoni mwa mambo mengine, mahitaji chini ya Sheria ya Usimamizi wa Mazingira (EMA 2004) na kanuni zake pamoja na kuzingatia mahitaji ya AfDB. Kwa upana, ilihusisha uelewa wa usuli wa mradi, uteuzi wa awali wa njia, awamu za mradi pamoja na hali ya msingi ambayo mradi ungefanyika. Tafiti za juu za dawati ziliunda msingi wa uelewa wa vipengele mbalimbali vya mradi ikiwa ni pamoja na taarifa kutoka Kigoma, Uvinza na Kasulu. Ushiriki na ushirikishwaji wa wadau ulifanyika na vikundi vya wadau katika ngazi za mikoa, wilaya, kata na vijiji, sekta binafsi na NGOs katika eneo la mradi.

Taarifa za msingi zilipatikana kupitia tafiti za nyanjani na uchunguzi katika eneo la mradi ikiwa ni pamoja na kukusanya sampuli za spishi mbalimbali za kibaolojia na ikolojia, ukusanyaji wa data za nyanjani zinazohusisha kijamii na kiuchumi, kelele na mitetemo ya ubora wa hewa, masomo ya eneo-kazi, na mashauriano ya umma na ushirikiano na wanachama wa jamii inayoishi katika maeneo ya mradi. Mbinu na mbinu za ziada zilijumuisha, tafiti, upigaji picha, na majadiliano na Mtetezi wa mradi. Data iliyokusanywa ilichambuliwa kwa ubora na kiasi na kufasiriwa kuhusiana na masuala muhimu yanayohusiana na sera za kitaifa, sheria na viwango na kanuni za kimataifa.

Tathmini ya Athari Chanya na Hasi

Utambulisho na utabiri wa athari zilikuwa michakato muhimu iliyowezesha kukadiria ukubwa, kiwango na muda wa athari zinazoweza. Ukubwa wa athari unahusiana na ukali wa athari, iwe athari inaweza kutenduliwa au haiwezi kutenduliwa, na kiwango cha uwezekano wa kupona kutokana na athari. Kiwango cha athari inayohusiana na eneo la ushawishi wa athari, ambayo inaweza kuwa mahususi ya tovuti, pekee kwa eneo la mradi, kikanda, kitaifa au hata kimataifa. Muda wa athari unahusiana na vipimo vya muda: vile vinavyodumu kwa miaka 3 pekee baada ya kuanzishwa kwa mradi viliainishwa kuwa vya muda mfupi; wale wanaoendelea kwa miaka 10 au zaidi lakini chini ya miaka 20 walichukuliwa kuwa wa muda wa kati; wakati zile zilizodumu zaidi ya miaka 20 zilizingatiwa kuwa za muda mrefu.

Zoezi hili pia lilipitia na kuchambua mwingiliano kati ya mradi uliopendekezwa na mazingira yaliyopo. Tofauti ilifanywa kati ya athari kubwa chanya na hasi, athari za moja kwa moja na zisizo za moja kwa moja, na athari za haraka na za muda mrefu. Athari, ambazo haziwezi kuepukika au zisizoweza kutenduliwa, na athari limbikizi. Popote inapowezekana na inatumika, athari zilielezwa kwa kiasi.

Kuzingatia Njia Mbadala

Uchambuzi wa njia mbadala ulijumuisha uchunguzi wa mbadala wa ‘hakuna mradi’, ambao unatathmini hali ya mazingira bila mradi huo. Pia inaeleza jinsi njia mbadala zikilinganishwa kulingana na athari zinazoweza kutokea, gharama, ufaafu chini ya hali za ndani, pamoja na mahitaji ya kitaasisi, mafunzo na ufuatiliaji.

Upangaji wa ukanda: Hii ilijumuisha kuzingatia njia mbadala ambazo zilichunguzwa wakati wa kuandaa mradi uliopendekezwa. Mpangilio wa sasa ni matokeo ya uchanganuzi ambao ulifanywa wakati wa upimaji. Wakati huo, njia tatu zilizingatiwa yaani Uvinza - Makere - Katanga Ushoroba; Ukanda wa Uvinza- Kasulu- Kigadye na Ukanda wa Kigoma - Buhigwe - Nyamugali. Uchambuzi wa njia mbadala ulizingatia urefu wa Ukanda; masuala ya kiikolojia na mazingira; Hali ya uendeshaji/Vigezo vya

Trafiki na usafiri na urahisi wa kufikika wakati wa ujenzi. Hakuna mjadala mbadala wa vipengele vingine vya njia mbadala vilivyozingatiwa (yaani, teknolojia, eneo na ukubwa wa vituo, mashimo ya kukopa, maeneo ya machimbo, kambi za wafanyakazi nk. kwa sababu maeneo ya vifaa hivi hayakutambuliwa.

Njia mbadala ya Uvinza - Kasulu -Kigadye ilichaguliwa kama mbadala iliyopendekezwa kwa sababu ilikidhi vyema tangazo la vigezo vingi hapo juu ni ambalo TAM hii imezingatia.

Maeneo ya Vituo: Kero ilitolewa na wadau kuhusiana na eneo la vituo kama vile kuwa na kituo kijiji cha Nyakitonto ikizingatiwa kuwa ni makao makuu ya Wilaya ya Kasulu na kitovu cha shughuli nyingi za kiuchumi ikiwemo mipango ya kuwa na soko la kimataifa na ghala la kuhifadha bidhaa. ya mazao na kiwanda cha saruji kilichopendekezwa.

Zaidi ya hayo, kulikuwa na mapendekezo ya kujenga kituo katika kijiji cha Bweni cha Kilelema Wilaya ya Buhigwe kwa sababu kijiji hiki ndicho kitovu cha mapato ya Wilaya ya Buhigwe na kuna mipango ya kujenga daraja linalounganisha na Burundi katika kijiji hicho. Wilaya inahoji kuwa kuwa na kituo katika eneo hilo kutachochea ukuaji zaidi wa uchumi katika wilaya hiyo, na kuongeza mtiririko wa biashara kati ya Tanzania na Burundi.

Mbadala wa Urekebishaji: Hoja ilitolewa kuhusu mpangilio wa sasa ambao unapita katika eneo nyeti la kijeshi. Jeshi lilipanua mipaka yake kujumuisha sehemu ya ardhi ambayo hapo awali ilikuwa chini ya matumizi ya jamii. Fidia kwa watu walioathirika inaendelea. Kwa hiyo, jeshi, wilaya na mkoa wana wasiwasi kuwa eneo la sasa la usawa ni kukata kijeshi na Kituo cha Shunga kilichopendekezwa na kitanzi cha kupita pia ni katika eneo la kijeshi. Mpangilio huo unapitia mifumo kadhaa ya usambazaji wa maji na vijito vinavyolisha Kambi. Wanajeshi wana wasiwasi kwamba kuwa na njia ya reli, kituo na kitanzi cha kupita ndani ya eneo la kijeshi kutajumuisha sio tu masuala ya usalama lakini pia na zaidi, kupunguza upanuzi uliopangwa na maendeleo ya kambi. Kwa hivyo ilipendekeza kurekebisha mpangilio huu, kuhamisha kituo na kitanzi cha kupita ili kuepusha eneo la jeshi.

Muundo wa Ripoti

Utoaji wa taarifa ya Rasimu ya TAM kwa Umma

Taarifa muhimu kwa mradi zilifichuliwa katika hatua tofauti za mchakato wa TAM kama sehemu ya mchakato wa Ushirikishwaji wa Wadau. Taarifa zilizofichuliwa zilijumuisha madhumuni, asili, na ukubwa wa mradi; muda wa shughuli mbalimbali za mradi, hatari na athari zinazotokana na mradi na hatua za kupunguza ikijumuisha masuala yanayohusiana na fidia na haki za watu walioathirika kwa masuluhisho mbalimbali kama yalivyoainishwa na sheria za Tanzania. Taarifa kuhusu wadau kuhusiana na utaratibu wa utatuzi wa malalamiko na mchakato ambao washikadau wanaweza kutumia katika TAM nzima na mzunguko wa mradi. mchakato. Njia zifuatazo zimeanzishwa kwa ajili ya kusajili malalamiko:

- Mawasiliano ya maandishi kupitia Fomu za Malalamiko ya Mradi
- Mawasiliano ya mdomo ana kwa ana au kupitia simu kwa wawakilishi wa kijiji au Shirika la Reli Tanzania
- Kupitia nambari ya simu ya bure ya Mradi (0800-110-042) inayofuatiliwa na wafanyakazi wawili walioteuliwa wa Shirika la Reli Tanzania.
- Ripoti ya TAM pia itashirikiwa kupitia maeneo ya wazi ya umma kama vile tovuti za Shirika la Reli Tanzania na Benki ya Maendeleo ya Afrika, ofisi za mikoa na wilaya ili kuongeza upashanaji wa taarifa.

Mfumo wa Sera, Sheria na Udhibiti

Utafiti wa TAM unafanywa kwa kuzingatia sera husika, mfumo wa kisheria na kiutawala wa Jamhuri ya Muungano wa Tanzania ikijumuisha Sheria ya Usimamizi wa Mazingira ya mwaka 2004, na Kanuni za Usimamizi wa Mazingira (Tathmini na Ukaguzi wa Athari kwa Mazingira) (Marekebisho) (2018) na Maendeleo ya Afrika. Miongozo na Sera za Benki ya Mazingira na Kijamii na Mbinu Nyingine Bora za Kiwanda cha Kimataifa.

Mradi unaibua vyombo na mahitaji ya kitaifa na kimataifa. Kwa upande wa usimamizi wa mazingira, Baraza la Taifa la Usimamizi wa Mazingira (NEMC) ni taasisi ya kisheria inayosimamia, kusimamia na kulinda mazingira na kwa ugani miongozo ya Tathmini ya Athari za Kimazingira na Kijamii (TAM), huku Waziri wa Nchi Ofisi ya Waziri Mkuu anayeshughulikia Mazingira akiidhinisha mchakato wa tathmini ya athari za mazingira na kijamii. utoaji wa cheti cha mazingira.

Baraza la Taifa la Usimamizi wa Mazingira (NEMC)

Sheria ya Usimamizi wa Mazingira ya mwaka (2004) inaipa Baraza la Taifa la Usimamizi wa Mazingira mamlaka ya kusimamia mchakato wa TAM unaojumuisha uchunguzi na uidhinishaji wa ripoti za TAM. Baada ya kuidhinisha ripoti za TAM, Sheria ya (2004) inaitaka Baraza la Taifa la Usimamizi wa Mazingira kupitia Waziri anayehusika na Mazingira kutoa Cheti cha Mazingira. Kwa hiyo, mchakato wa EIA wa mradi unaopendekezwa wa reli ya Uvinza – Kigadye utasimamiwa na taasisi hiyo hiyo.

Taasisi nyingine ambazo maamuzi yake ya kiutawala yataendana na mapendekezo ya maendeleo ni pamoja na Wizara ya Ardhi, Nyumba na Maendeleo ya Makazi kwa masuala ya ardhi, Wizara ya Maji na Umwagiliaji kwa masuala yanayohusu maji, Huduma za Misitu Tanzania chini ya Wizara ya Maliasili na Utalii (Misitu). Idara) itawajibika kwa masuala yanayohusiana na upotevu wa mazao ya misitu na misitu. Mamlaka ya Usimamizi wa Wanyamapori Tanzania (TAWA) itawajibika kwa masuala yanayohusiana na wanyamapori. TAM hii inashughulikia uanzishwaji wa utawala na kiwango ambacho mradi umekuza uratibu miongoni mwa watoa maamuzi na watendaji wakuu.

Benki ya Maendeleo ya Afrika (AfDB)

Mfumo wa Kinga wa Kundi la Maendeleo la Afrika: Tamko la Sera na Ulinzi wa Kiutendaji, 2013

Ulinzi wa mazingira na kijamii wa Benki ya Maendeleo ya Afrika (AfDB) ni msingi wa msaada wa Benki kwa ukuaji wa uchumi jumuishi na uendelevu wa mazingira barani Afrika. Benki imeunda Mfumo Unganishi wa Ulinzi ili kueleza sera zake za ulinzi huku ikiboresha uwazi, uwiano na uthabiti. Mfumo Unganishi wa Ulinzi hujengwa juu ya anuwai ya sera na ulinzi wa hapo awali. Mfumo Unganishi wa Ulinzi inaleta sera na mikakati hii katika mfumo shirikishi ambao unanuiwa kuimarisha ufanisi na umuhimu wa kazi ya Benki. Mfumo Unganishi wa Ulinzi ina vipengele vinne vinavyohusiana ambavyo ni pamoja na:

- **Taarifa ya Sera ya Pamoja ya Ulinzi** - Inafafanua malengo ya pamoja ya ulinzi wa Benki na inaweka kanuni za sera. Imeundwa ili kutumika kwa mbinu za sasa na za baadaye za ukopeshaji, na inazingatia uwezo na mahitaji mbalimbali ya nchi wanachama wa kikanda katika sekta ya umma na ya kibinafsi.
- **Ulinzi wa Uendeshaji** - ni seti ya mahitaji matano ya ulinzi ambayo wateja wa Benki wanatarajiwa kutimiza wakati wa kushughulikia athari na hatari za kijamii na kimazingira.
- **Taratibu za Tathmini ya Mazingira na Kijamii** - Hii inatoa mwongozo kuhusu taratibu mahususi ambazo Benki na wakopaji au wateja wake wanapaswa kufuata ili kuhakikisha kwamba shughuli za Benki zinakidhi mahitaji ya Mfumo wa Uendeshaji katika kila hatua ya mzunguko wa mradi wa Benki.
- **Tathmini Jumuishi ya Athari za Kimazingira na Kijamii** – Hati hizi za Mwongozo hutoa mwongozo wa kiufundi kwa wakopaji au wateja wa Benki kuhusu viwango vya masuala ya sekta, kama vile barabara na reli, umeme wa maji, au uvuvi, au kuhusu mbinu za kimbini wateja au wakopaji wanatarajiwa kupitisha ili kufikia viwango vya OS.

Kanuni za Uendeshaji kwa mujibu wa Benki ya Maendeleo ya Afrika ni pamoja na yafuatayo:

Kanuni ya Kiutendaji 1: Tathmini ya Mazingira na kijamii - Ulinzi huu mkuu unasimamia mchakato wa kubainisha kategoria ya mradi wa kimazingira na kijamii na matokeo ya mahitaji ya tathmini ya mazingira na kijamii.

Kanuni ya Uendeshaji 2: Utwaaji wa ardhi ya makazi mapya bila hiari, uhamishaji wa watu na kulipwa fidia - Ulinzi huu unajumuisha ahadi na mahitaji ya sera yaliyoainishwa katika sera ya Benki kuhusu uhamishaji wa watu bila hiari, na kujumuisha idadi ya uboreshaji iliyoungwa ili kuboresha ufanisi wa utendaji wa mahitaji hayo.

Kanuni ya Utendaji 3: Bioanuwai na huduma za mfumo ikolojia - Ulinzi huu unalenga kuhifadhi anuwai ya kibayolojia na kukuza matumizi endelevu ya maliasili. Pia inatafsiri ahadi katika sera ya Benki kuhusu usimamizi jumuishi wa rasilimali za maji kuwa mahitaji ya uendeshaji.

Kanuni ya Uendeshaji 4: Kuzuia na kudhibiti uchafuzi, nyenzo za hatari

na ufanisi wa rasilimali - Kinga hii inashughulikia athari kuu za uchafuzi wa mazingira, taka na nyenzo hatari ambazo kuna makubaliano ya makubaliano ya kimataifa, pamoja na viwango vya kina vya tasnia mahususi na kikanda, ikijumuisha uhasibu wa gesi chafu, ambayo benki zingine za maendeleo ya kimataifa hufuata. .

Kanuni ya Uendeshaji 5: Masharti ya kazi, afya na usalama - Ulinzi huu unaweka mahitaji ya Benki kwa wakopaji au wateja wake kuhusu hali ya wafanyikazi, haki na ulinzi dhidi ya unyanyasaji au unyonyaji. Pia inahakikisha uwiano zaidi na benki nyingine nyingi za maendeleo ya kimataifa.

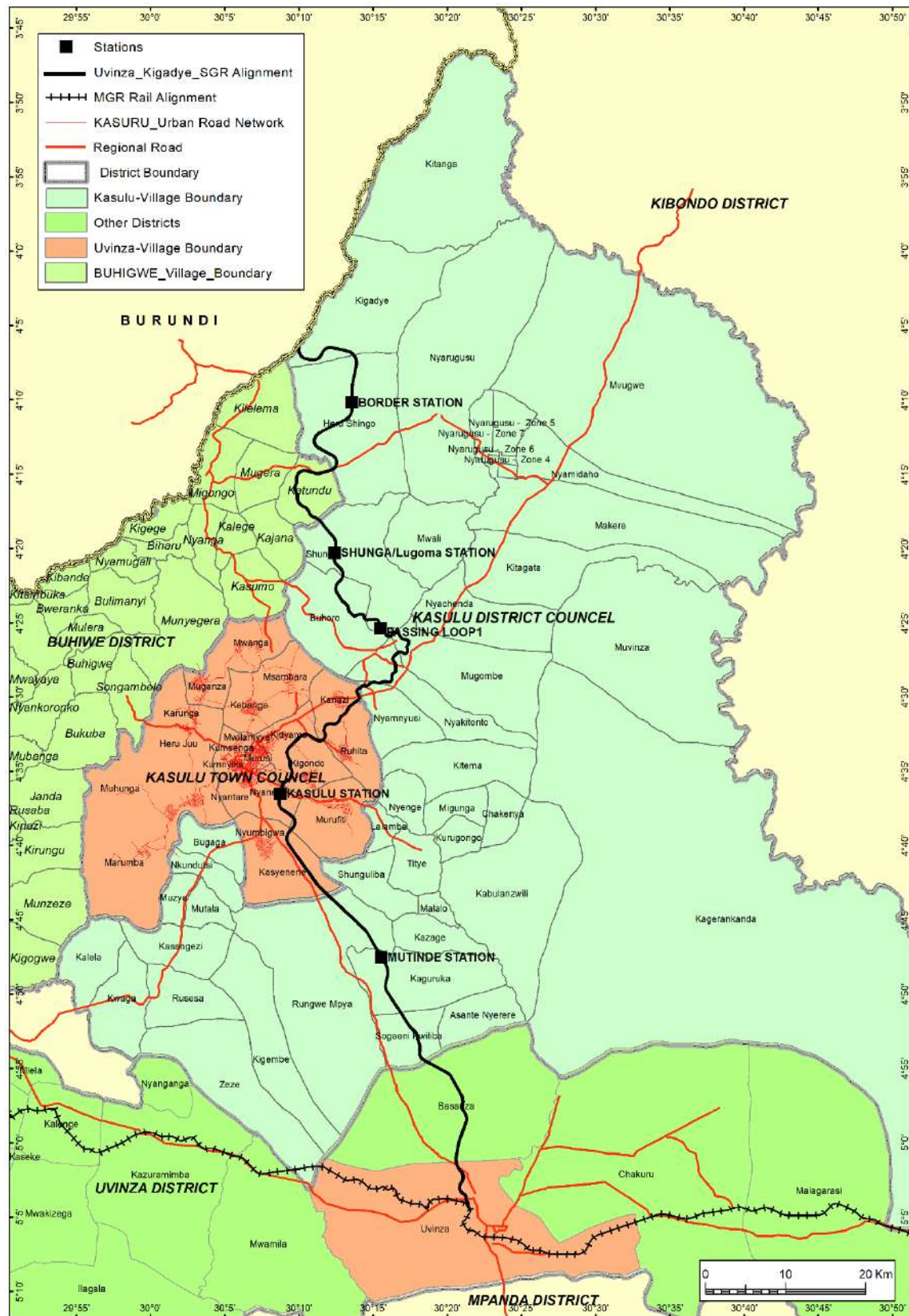
Maelezo ya Mazingira ya Mradi

Eneo la Mradi

Mradi wa SGR wa Uvinza – Kigadye utapitia Wilaya ya Uvinza kupitia Kasulu na Buhigwe mkoani Kigoma kupitia Mto Malagarasi katika kijiji cha Kigadye hadi Burundi. Njia ya reli inayopendekezwa inatarajiwa kuunganishwa na reli ya Tabora-Kigoma SGR, ambayo sasa inajengwa, na reli ya SGR kutoka Dar es Salaam hadi Mwanza kupitia Isaka inayoendelea kujengwa. Kutoka mahali pa kuanzia njia ya Reli ya Uvinza - Kigadye ina urefu wa kilomita 156.4 kutoka Uvinza kupitia wilaya za Kasulu na Buhigwe kabla ya kuvuka mpaka wa Mto Malagarasi hadi Burundi. TAM hii hata hivyo, inashughulikia sehemu ya Tanzania ambayo inaishia katika kijiji cha Kigadye kwenye mpaka kati ya Tanzania na Burundi. Njia ya reli ya SGR inapitia katika baadhi ya vijiji, kata na wilaya kama inavyooneshwa kwenye ramani namba 01.

Vipengele vya Mradi

SGR ya Uvinza-Kigadye inayopendekezwa itakuwa na vipengele vifuatavyo vya mradi wa maendeleo ya reli i) ununuzi wa ardhi kwa ajili ya ukanda wa reli (njia ya kuondoka, barabara za kuingia), tuta (njia, madaraja, njia za chini, ATS & catenary, signaling na mtandao wa mawasiliano. , ii) maeneo ya kutupa taka, mashimo ya kuazima, maeneo ya machimbo ya miamba, iii) kituo, yadi ya kupanga, na bohari za matengenezo. Vifaa vinavyohusiana kama vile njia ya kusambaza umeme vitawekewa TAM tofauti chini ya shirika la umeme TANESCO. Njia mpya ya reli ya Uvinza-Kigadye (Wilaya ya Kasulu) itategemea viwango vya hivi karibuni vya Uhandisi wa Reli na Utunzaji wa Njia za Marekani (AREMA) (ambazo vinakuza utendakazi baina ya) - hiyo ni Standard Gauge, ikiruhusu kuongeza kasi ya usanifu ya 160. km/h kwa treni za abiria na ya 120 km/h kwa treni za mizigo.



Ramani 01: Eneo la mradi wa SGR Uvinza -Kigadye

Taarifa kuhusu sifa za kijamii na kiuchumi za wilaya na vijiji/jamii ambazo mradi unapitia zimewasilishwa katika Sura ya 4 ya ripoti kuu. Katika TAM hii, Eneo la mradi na viunga vyake inafafanuliwa kupitia sifa za anga za eneo la karibu kutoka kilomita 0 kwenye mstari wa kati hadi kilomita 5 au zaidi, kulingana na shughuli zinazofanyika katika kila eneo. Kwa hivyo, Eneo la mradi inaweza kujumuisha maeneo ya kanda kulingana na shughuli za Mradi na athari zake kwa vigezo vya mazingira na kijamii. Maeneo ambayo nyenzo za ujenzi zitatolewa hata kama ziko zaidi ya kilomita 5 kutoka mstari wa kati, yaliunda sehemu ya mradi wa Aol kwa sababu ya hatari na athari zinazoweza kutokea kutokana na kupata na kusafirisha vifaa hivyo vya ujenzi.

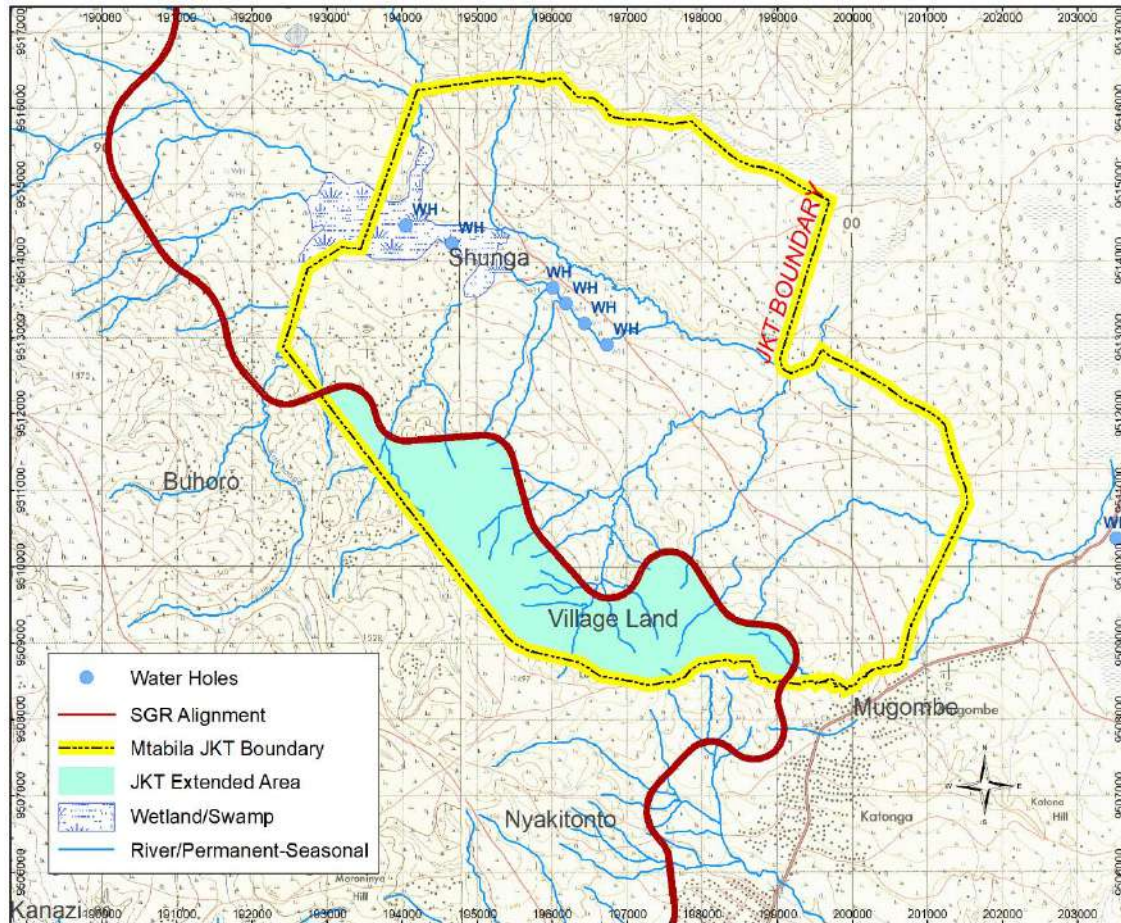
Maelezo ya Njia

Asili ya mazingira ambamo ukanda wa reli hupitia ni tofauti sana kuanzia maeneo yenye mvua nyingi hadi maeneo kame na nusu kame. Tofauti na maeneo mengine ya SGR (1-6) yanayoendelea kujengwa sasa nchini Tanzania ambapo uunganisho wake unakaribia kufanana na Reli iliyopo ya Mita (MGR), SGR ya Uvinza -Kigadye itajengwa kwenye maeneo mapya kabisa, hivyo kugusa vipokezi nyeti kama vile jamii. ardhi, hifadhi za misitu, ardhi oevu, vyanzo vya maji na huduma za kijamii taasisi za umma na miundombinu ya kiuchumi kama vile barabara za vijijini na mijini, na kupelekea kufunguliwa zaidi kwa ardhi kubwa upande wa magharibi mwa Tanzania.

Njia ambayo Mradi wa SGR unapitia kuanzia maeneo yenye mvua nyingi hadi maeneo kame. Topografia ya eneo la mradi wa reli ya lina sifa ya miteremko kiasi na nchi tambarare, na miinuko mikubwa na ya wastani ambayo yamegawanywa na mito ya kudumu na ya msimu. Huko Uvinza, njia ya reli itapita katika maeneo ambayo ni tambarare kiasi na kupaa kwa taratibu kupita kilima cha Msebei hadi Kasulu, na kisha kutoka Kasulu, mradi wa reli unatarajiwa kuyumba na kupaa hatua kwa hatua kupitia mfululizo wa maeneo ya milima hadi Heru Ushingo. Mradi huo kisha unapitia eneo la nyanda tambarare la Mto Malagarasi na uwanda wa mafuriko kabla ya kupitia maeneo tambarare ya mashamba makubwa ya miwa.

Mito mikubwa iliyopo eneo la mradi ni Malagarasi, Ruchugi, Mgera na Mito Muyowosi. Hata hivyo, kuna mito kadhaa miogomidogo ambayo huvuka njia ya reli na kwa hiyo inahitaji madaraja. Tofauti hizi huzalisha aina mbalimbali za uoto kama vile misitu ya asili ya miombo huko Uvinza, Basanza, Nyansha na mashamba makubwa ya Nyansha-Kasulu-Mtabila, Kutoka Mtabila hadi Shunga na Buhigwe (Katundu), vichaka hadi nyanda za misitu. Pia kuna uwanda wa nyasi na misitu ya kupandwa ya mikaratusi.

Katika Halmashauri ya Wilaya ya Kasulu, njia ya SGR inayopendekezwa kwa Uvinza -Kigadye inapita eneo nyeti karibu na kijiji cha Nyakitonto kata ya Nyakitonto, kufuatia uamuzi wa serikali wa kupanua mipaka ya kambi ya wakimbizi ya awali ambayo imegeuzwa kuwa nyeti. Serikali tayari imeshafanya uthamini wa mali na watu walioathirika katika eneo hilo na fidia italipwa kutoka bajeti ya kitaifa ya 2022/23 ili kuruhusu shughuli katika eneo hili kuendelea. Kwa kuzingatia hili, na kwa kuzingatia unyeti wa eneo hili, itakuwa muhimu kutafakari upya - urekebishaji wa njia inayoenda zaidi ya 400m kusini-magharibi kutoka kwa mpaka uliopanuliwa wa sasa ili kuepusha eneo hili nyeti. Ramani ya 02 inaonyesha eneo lililotajwa kuhusiana na mpangilio wa sasa wa SGR na mpaka uliopanuliwa.



Ramani 02: Uvinza - Kigadye SGR ikivuka mitambo nyeti katika Kijiji cha Nyakitonto.

Shughuli za Mradi

Utekelezaji wa SGR ya Uvinza -Kigadye utafanyika kwa awamu zifuatazo:

- Awamu ya kubuni na uhamasishaji.
- Awamu ya Ujenzi.
- Awamu ya Uendeshaji.
- Awamu ya kusitisha mradi

Kila moja ya awamu hizi itakuwa na shughuli tofauti zinazofanyika kwa kufuatana au kwa pamoja na mlolongo wa utekelezaji utategemea ratiba na vipengele vya kubuni ambavyo shirika la reli Tanzania kama mteja na mwasiliani watakubaliana. TAM hii inashughulikia awamu zote za mradi kwa sababu kila awamu ina hatari tofauti na athari kwa mazingira ya kupokea.

Taarifa za msingi juu ya eneo la mradi

Taarifa za kimsingi ya kijamii na kiuchumi

Utangulizi

Sehemu hii inalenga kutathmini, kutathmini, kutambua na hali ya kijamii na kiuchumi ya eneo la mradi linalopendekezwa la ushawishi. Inaangazia masuala muhimu kama vile demografia, maisha, uchumi, afya, elimu, mapato, chakula, kazi, soko, taka, usafi wa mazingira, usafi, n.k.

Idadi ya watu

Matokeo ya Sensa ya Watu na Kaya Kitaifa ya mwaka 2022 yalibainisha kuwa idadi ya wakazi wa wilaya ya Kasulu ilikuwa 537,767 kati yao wanawake 276,835 na wanaume 260,932, huku ukuaji wa ukuaji wa mwaka ukiwa 2.4. Jumla ya kaya ni 102,332 na wastani wa kaya katika wilaya ni 5.3. Idadi kubwa ya ukubwa wa kaya katika wilaya ya Kasulu inaweza kuhusishwa na wimbi la wakimbizi kutoka nchi jirani. Viwango hivyo vya juu vya ongezeko la watu katika wilaya hizi vinaweza kuwa na shinikizo kubwa kwa ardhi na kusababisha migogoro ya matumizi ya ardhi kando ya ukanda wa reli.

Kwa kuzingatia takwimu zilizotajwa hapo juu za mwaka 2022 jumla ya wakazi katika eneo la Mradi kwa halmashauri za wilaya tatu ni watu 1,016,093 ambapo wanaume ni 485,783 na wanawake 530,310 wenye jumla ya kaya 195.112 na wastani wa kaya 5.2. Mradi huo unaelekea kuvutia watu wengi kuingia katika eneo la mradi hivyo kuongeza idadi ya watu katika vijiji vya eneo la Mradi. Kwa kuongeza, kwa kuwa wengi wa wanaotafuta kazi wana uwezekano wa kuwa wachanga, ambao wako katika umri hai wa uzazi, kuna uwezekano pia kwamba ongezeko la watu katika eneo la Mradi litaharakishwa kupitia ongezeko la asili.

Shughuli za kiuchumi

Chanzo kikuu cha kipato kwa wakazi ndani ya eneo la mradi ni shughuli za kilimo, uvuvi na ufugaji. Wakazi kadhaa wanajishughulisha na kilimo cha kujikimu hasa katika mahindi, maharagwe, mpunga, mihogo ya mboga n.k. Kilimo cha umwagiliaji kinafanyika katika wilaya za Uvinza, Kasulu na Buhigwe. Umwagiliaji ni hasa kwa mpunga, mazao ya bustani, na mahindi wakati wa kiangazi. Umwagiliaji kwa mazao ya bustani hufanywa hasa kando ya mabonde ya mito. Wilaya ya Kasulu kilimo cha umwagiliaji kinafanyika katika maeneo ya Titye, Lalambe, Nyenge & Migunga (kata ya Titye), Rungwe Mpya, Kaguruka, Nyumbigwa (Rungwe Mpya), Kabanga, Buhoro, Msambara, Kidyama na Kanazi (kata ya Msambara). Katika wilaya ya Uvinza umwagiliaji unafanyika katika mabonde ya Kashagulu, Mgambazi, Nkonkwa na Machazo. Reli inayopendekezwa inapita katika baadhi ya vijiji vinavyolima kilimo cha umwagiliaji kama vile Rungwe Mpya, Kidyama na Buhoro wilayani Kasulu.

Uvuvi ni shughuli muhimu ya kiuchumi katika wilaya zote zilizoathirika Wilaya ya Uvinza ina fursa ya ufugaji wa samaki kwa sababu upande wa kusini-magharibi wilaya hiyo inapakiwa na Ziwa Tanganyika lenye urefu wa kilomita 6,425 za eneo la maji, ufukwe wa kilomita 212, na mabwawa ya Sagara na Nyamagoma pamoja na Mto Malagarasi. Katika wilaya ya Kasulu shughuli za ufugaji samaki hufanyika Nyakitonto, Mugombe, Heru Ushingo, Kagerankanda, Mvinza, Rungwempya, Nyamidaho, Kitagata na Mwali. Jumla ya kaya 900 zinajihusisha na shughuli za ufugaji samaki kwa vikundi na mtu mmoja mmoja na inakadiriwa kuwa takriban tani 52 zinazozalishwa na kuliwa majumbani.

Usafiri

Eneo linalopendekezwa la Mradi halina barabara nzuri ya kufikia na wakati wa msimu wa mvua, Mradi wa SGR wa Uvinza hadi Kigadye unakaribia kutoweza kufikiwa wakati wa ushindani wa mifereji ya maji ya asili, maeneo oevu, vinamasi na mengineyo. Halmashauri ya Mji wa Kasulu ina jumla ya mtandao wa barabara wa 294.55Km ambapo 203.5Km ni za udongo, 90.05Km ni za changarawe na 1.5km ni za lami. Hali inaonyesha kuwa Km 294.55 ni barabara za ardhini na kwa wastani ziko katika hali nzuri. Halmashauri ya Wilaya ya Kasulu, TARURA hadi sasa imekuwa ikitunza barabara za changarawe (km 146) na barabara za Earth (km 245) ambazo ni jumla ya kilomita 391.3 pekee. Hivi sasa katika wilaya ya Buhigwe hakuna barabara za lami. Ina jumla ya kilomita 574 za barabara3, kati ya hizo kilometa 30 ni barabara kuu, kilomita 60 ni Barabara za Mikoa, kilomita 282 ni Barabara za Wilaya, na zilizobaki kilomita 202 ni barabara za nje. Kwa ujumla barabara kuu za mkoa na barabara za malori zinapitika kwa mwaka mzima lakini barabara kuu na barabara za Wilaya hupitika kwa shida wakati wa mvua. Utafiti huo umebaini kuwa sekta ya uchukuzi ina uwezo mkubwa wa kiuchumi na faida inapopewa kipaumbele na serikali ya kitaifa. Utekelezaji wa mradi utahitaji uboreshaji wa barabara zilizopo na madaraja kwa usafirishaji wa vifaa na vifaa vya ujenzi.

Hali ya huduma za afya na vifaa

Katika eneo la mradi unaopendekezwa wa SGR wa Uvinza – Kigadye kuna zahanati na vituo vya afya karibu katika vijiji vyote vilivyoathirika. Pia kuna hospitali katika makao makuu ya wilaya. Huduma za afya zinazotolewa katika miji ya Kasulu, Uvinza na Buhigwe ni bora zaidi ikilinganishwa na jamii za vijijini. Hii ni kwa sababu ya uwepo wa huduma nzuri katika maeneo ya mijini ikilinganishwa na vijijini. Malaria imekuwa ugonjwa unaoongoza kwa kuua watu 31,047 na vifo 199, ikifuatiwa na Neonatal Condition kesi 376 na vifo 85, PEM idadi ya kesi 400 na vifo 71 mtawalia. Nyingine ni UKIMWI na kifua kikuu. Watoto ni kundi la hatari zaidi lililoathiriwa na magonjwa haya.

Elimu

Ufikiaji wa kujua kusoma na kuandika miongoni mwa watu unatofautiana, na unaonyesha ukosefu mkubwa wa usawa, kwa jinsia, eneo na mapato. Kulingana na matokeo ya tathmini, zaidi ya nusu (asilimia 62.5) ya wakuu wa kaya waliohojiwa wamefaulu elimu ya msingi na karibu asilimia 9.7 wamepata elimu ya sekondari. Aidha, kuna idadi kubwa (asilimia 16.7) ya wakuu wa kaya ambao hawajapata elimu rasmi. Pia kuna idadi kubwa ya wakuu wa kaya asilimia 6.4 walioacha shule za msingi.

Nishati

Mfumo wa usambazaji umeme nchini Tanzania unaendeshwa na Kampuni ya Ugavi wa Umeme Tanzania (TANESCO). Hata hivyo, vijiji vingi vilivyoathirika havijaunganishwa kwenye Gridi ya Taifa. Kwa hivyo, zaidi ya 90% ya watu katika eneo la mradi hutegemea nishati ya kuni kwa kupikia nyumbani. Hii inatilia maanani hitaji la usimamizi

na uhifadhi wa misitu. Nishati ya jua pia hutumiwa kwa umeme, hata hivyo, nishati inayotokana na paneli za jua kutoka kwa miale ya jua ni mdogo kwa majengo machache ya taasisi ya serikali na ya watu wachache sana. Mafuta ya kisukuku kama vile dizeli, mafuta na petroli hutumika kuwezesha usafiri na biashara mbalimbali. Kwa upande wa wakazi wa mijini na vijijini sehemu kubwa inategemea mafuta ya taa kwa taa badala ya jenereta.

Ugavi wa maji

Wilaya ya Uvinza ina takribani asilimia 52.9 ya wakazi wake wanaopata maji kutoka vyanzo mbalimbali vilivyoboreshwa kama vile chemchemi, mito, visima vifupi na vifupi na Ziwa Tanganyika. Mito mikuu inayotumika kama chanzo cha maji wilayani Uvinza ni pamoja na Mto Mugonya, Luiche na Mukuti. Mavuno ya mvua pia hufanywa wakati wa msimu wa mvua. Katika Mji wa Kasulu, asilimia 62.4 ya wakazi wa wilaya wanapata maji safi, nafuu na salama kutoka kwa aina mbalimbali. Kuna skimu 11 za bomba la Gravity, mashimo 6, skimu ya maji ya chemchemi 43, visima vifupi 3 na matenki 8 ya kuvuna maji ya mvua. Kuna vyanzo 208 vya maji bado havijatumika hivi vinajumuisha visima 57 vifupi, 74 vya maji ya chemchemi na vijito 56. Wilaya ya Buhogwe ina maji ya mvuto 23, visima vifupi 36, chemchemi 108 na miundombinu 32 ya kuvuna maji ya mvua.

Uzalishaji na utupaji taka

Hivi sasa, hakuna maeneo maalumu ya kutupa taka ndani ya eneo linalopendekezwa la mradi. Taka katika miji ya Kasulu, Uvinza na Buhigwe na taka nyingine za biashara zinazozalishwa kwa kawaida hufukiwa, kuchomwa moto au kutupwa kwenye maeneo ya wazi au nyika. Kwa kuzingatia matarajio ya Mradi wa SGR wa Uvinza hadi Kigadye, uzalishaji, ukusanyaji na usimamizi wa taka utakuwa mkubwa wakati wa awamu ya ujenzi na awamu ya uendeshaji wa maendeleo ya mradi. Kwa hiyo, ni muhimu kuanza mazungumzo kuhusiana na mipango, uendelezaji na usanifu wa eneo la baadaye la dampo ambalo litasaidia shughuli za Mradi wa SGR Uvinza hadi Kigadye.

Athari kuu na za wastani za mazingira na jamii

Athari Chanya

Kuongezeka kwa fursa za ajira

Hali ya ajira kwa vijana bado ni moja ya changamoto kuu nchini Tanzania. Utafiti Jumuishi wa Nguvu Kazi 2014 unaonyesha kuwa viwango vya ukosefu wa ajira ni vya juu zaidi kwa watu walio chini ya miaka 35 katika maeneo yote. Jumla ya vijana walioajiriwa (wenye umri wa miaka 15-34) kwa mujibu wa Ufafanuzi wa Kitaifa ni 11,007,809 wakati vijana wasio na ajira ni 1,463,182 takriban 10.0% ya nguvu kazi yote ya vijana (ILFS, 2014.). Afua mbalimbali zinazohusisha sio tu mashirika ya serikali, bali wadau wengine zikiwemo asasi za kiraia, wafadhili wa kimataifa na, kwa kiasi kidogo, sekta binafsi zinafanywa ili kuongeza fursa za ajira nchini.

Kulingana na maoni yaliyo hapo juu, maendeleo yaliyopendekezwa yataunda fursa za ajira kwa wafanyikazi wa kawaida. Kuanzishwa kwa kambi za ujenzi wakati wa awamu ya uhamasishaji kutaunda ajira za moja kwa moja na zisizo za moja kwa moja kwa wenyeji pamoja na watu kutoka sehemu zingine. Ajira ya moja kwa moja itakuwa katika mfumo wa vibarua wasio na ujuzi na ujuzi. Fursa zaidi za ajira zinatarajiwa wakati wa awamu ya ujenzi wakati kazi kubwa zaidi itahitajika katika ujenzi wa barabara za kuingilia, kazi za udongo, tuta za reli, uwekaji wa reli, ujenzi wa vituo, vituo, madaraja, kalvati na miundombinu mingine inayohusiana nayo. Awamu ya ujenzi pia itazalisha ajira zisizo za moja kwa moja kwa watu mbalimbali wakiwemo wauzaji chakula (hasa wanawake) na wafanyabiashara wengine wadogo kama vile uuzaji wa vinywaji baridi. Makadirio ya nguvu kazi katika awamu zote za mradi imeonyeshwa kwenye Jedwali 2 4.

Kuongezeka kwa mapato ya serikali

Usafirishaji wa mizigo ndiyo lengo kuu la miradi hiyo na hivyo kuwa na athari kubwa kwa mapato ya Serikali kupitia kodi kutokana na usafirishaji wa mizigo na makontena Dar es Salaam hadi Gitega kupitia kituo cha reli cha Uvinza. Ongezeko kubwa la mapato ya Serikali litaanza kupatikana katika awamu ya operesheni kutokana na usafirishaji wa bidhaa mbalimbali kama vile madini ya nikeli kutoka Msongati na huduma nyinginezo. Njia ya reli hiyo pia itachochea kilimo, madini na maendeleo ya viwanda. Hata hivyo, faida za kiuchumi kutokana na kituo cha Reli cha Uvinza hazieleweki kwa sababu si moja ya vituo vinavyotakiwa kuendelezwa zaidi kama sehemu ya mradi wa Reli ya Uvinza hadi Kigadye.

Vile vile, mapato yatatokana na kodi zitakazokusanywa kama mapato yatokeanayo na usafirishaji wa bidhaa mbalimbali kwani mradi unatarajiwa kuendeshwa katika vikundi vitatu vikubwa vya trafiki ambavyo ni, usafirishaji wa mizigo ya kimataifa kwenda na kutoka Burundi International uagizaji na usafirishaji wa bidhaa kutoka nje kwenda na kutoka Dar es. Bandari ya Salaam na usafirishaji wa mizigo na abiria ndani ya Uvinza, Kasulu hadi Kigadye

Chanzo kingine cha mapato ya serikali wakati wa awamu ya operesheni kitatoka kwa idadi kubwa ya wafanyikazi ambao watakuwa wakilipa ushuru kwa serikali kama "Pay-as-You Earn (PAYE).

Uboreshaji wa uchumi wa ndani

Bila shaka, sekta ya usafiri ina mchango mkubwa katika usafirishaji wa bidhaa kutoka sehemu moja hadi nyingine na hivyo kukuza sekta ya kilimo, viwanda na sekta nyingine za uchumi. Mradi wa reli hiyo utachochea uchumi wa ndani na kuboresha hali ya maisha ya watu wanaoishi kando ya njia ya reli iliyopendekezwa katika nchi hizo mbili. Hii ni kwa sababu reli inapitia maeneo yenye uwezo wa kuendeleza kilimo na uchimbaji madini.

Kilimo ndio sekta inayoongoza katika uchumi wa Tanzania na itaendelea kuwa hivyo kwa miongo kadhaa ijayo. Sekta hii inachangia takriban 50% katika Pato la Taifa: mazao ya chakula yanachangia takriban 35% ya Pato la Taifa la kilimo ikifuatiwa na uzalishaji wa mifugo, ambao unachangia 30% ya Pato la Taifa la kilimo. Kwa kweli, kilimo huchangia zaidi ya 60% ya mapato ya mauzo ya nje. Inakadiriwa kuwa takribani

asilimia 95 hadi 97 ya chakula kinachotumika nchini huzalishwa ndani ya nchi huku kukiwa na bidhaa za vyakula ambazo hazijazalishwa kwa wingi wa kutosha nchini n.k. ngano na sukari.

Wakati wa awamu ya ujenzi na uendeshaji, wenyeji wasio na ujuzi na ujuzi wataajiriwa katika shughuli tofauti. Hii itazalisha mapato kwa watu ambao watakuwa na uwezo wa kununua na kulipia mahitaji yao tofauti. Njia ya reli pia inapita maeneo ya mbali bila njia yoyote ya usafiri. Katika awamu ya operesheni, njia ya reli itafungua maeneo hayo na kupunguza gharama za usafiri pamoja na kuongeza uhakika wake na kurahisisha usafirishaji wa mazao ya kilimo katika vijiji vya Rungwe Mpya, Katundu, Buhoro na Basanza ambavyo vina uwezo wa kuzalisha mpunga. mahindi, ndizi, mihogo na miwa.

Kwa hiyo, inatarajiwa kuwa ujenzi wa njia ya reli utachochea maendeleo ya kilimo kwa sababu ya usafiri wa uhakika ambao utaongeza mkulima kupata masoko. Athari za uwekezaji huu wa reli kwa hivyo zitakuwa za muda mrefu na muhimu sana wakati wa awamu ya uendeshaji wa mradi.

Reli hiyo pia itawezesha usafirishaji wa zana za kilimo, kukuza biashara ndogondogo kwenye eneo la mradi; kuongeza mapato kwa jamii; kuwezesha usafirishaji wa vifaa vya ujenzi; na kupunguza bei ya vifaa vya ujenzi na kuwawezesha watu kujenga nyumba za kisasa na hivyo kuboresha maisha yao. Kwa upande mwingine, mradi utakuwa na athari mbaya wakati wa awamu ya uondoaji kazi kwa sababu vibarua watapunguzwa kazi na hivyo kupoteza njia zao kuu za mapato.

Kuimarika kwa Biashara ya Kikanda

Reli inayopendekezwa ya Uvinza - Kigadye itaunganishwa na njia ya reli ya Dar es Salaam - Kigoma huko Uvinza kupitia mpango mwingine, wa kuboresha reli iliyopo Dar es Salaam - Kigoma hadi Standard gauge. Njia ya reli ya Uvinza - Kigadye itapita katika wilaya za Uvinza na Kasulu ambako mazao ya mahindi, mpunga na muhogo yanazalishwa na kuhitajika sana nchini Burundi. Aidha, njia ya reli inaweza kuimarisha biashara ya chumvi inayozalishwa Uvinza. Kwa bahati mbaya, mradi huu hauonekani kujumuisha uboreshaji wa miundombinu ya reli ya Uvinza inayounganishwa na tasnia ya chumvi iliyo karibu katika suala la usafirishaji. Iwapo hali itakuwa hivyo, ni bahati mbaya sana kwani reli ya Uvinza - Kigadye itapunguza kwa kiasi kikubwa uwezo wa kiuchumi wa Wilaya ya Uvinza na mkoa wa Kigoma.

Kwa hivyo miundombinu itatarajiwa kupunguza gharama ya kufanya biashara katika kanda hivyo kuvutia uwekezaji kadhaa unaohitajika ili kuchochea ukuaji wa uchumi unaohitajika. Kuimarisha biashara ya kikanda kutaleta ukuaji wa uchumi na ajira na kuzalisha mali na mapato ya kibinafsi na nchi na Afrika Mashariki kwa ujumla kwa kiasi kikubwa.

Kuboresha mfumo wa usafirishaji

Wakati wa awamu ya operesheni, usafirishaji wa mizigo na abiria itakuwa shughuli muhimu zaidi. Njia ya reli ya Uvinza - Kigadye itatoa usafiri mkubwa katika njia kuu ya kati kwa kuwa itaunganisha njia ya Kati kupitia Kaliua. Pia, itarahisisha biashara ya kikanda kwa kuunganisha Jamhuri ya Kidemokrasia ya Kongo kupitia Rwanda na Burundi. Njia hii ya reli inapitia maeneo ya uchimbaji chumvi huko Uvinza, hivyo bidhaa za chumvi kutoka Uvinza zingefafirishwa hadi katika masoko mbalimbali ya Burundi, Rwanda na Tanzania. Mazao ya chakula na biashara ikiwa ni pamoja na mifugo

yangesafirishwa kwenda na kutoka katika masoko mbalimbali pamoja na malighafi kwenda kwenye viwanda husika.

Athari Hasi

Upotevu wa ardhi, mali na mali nyinginezo

Upotevu wa ardhi

Upotevu wa ardhi ya watu na mali nyingine ni mojawapo ya athari kubwa katika mradi huu. Awamu ya uhamasishaji wa mradi unaopendekezwa wa reli itahusisha upatikanaji wa ardhi kwa njia ya reli, kambi na stesheni. Muundo wa awali unaonyesha kuwa njia ya reli inayopendekezwa itasafiri kilomita 156 kati ya Uvinza (Tanzania) hadi Kigadye. Kwa kuwa njia nyingi zinapitia maeneo ya mashambani, njia ya mita 60 itahitajika au jumla ya takriban ekari zitapatikana. Uchukuaji wa ardhi wa ziada utahitajika kwa ajili ya vituo vya reli na kwa mfano Kasulu, Jumla ya ardhi iliyoathirika inayohitajika kwa ukanda wa reli kutoka Uvinza - Kigadye ni takriban 12,975,120m² sawa na ekari 3,206 na jumla ya ukubwa wa ardhi unaohitajika kwa stesheni ni takriban 1,168,000 m² sawa na 289. ekari za ardhi.

Aidha, tathmini ya shamba hilo ilibainisha kuwa takriban mashamba 160 ya ardhi ya kilimo ambayo hutumika kwa kilimo cha mazao ya kudumu na msimu yataathirika. Kwa hivyo, shughuli za kilimo kama njia ya kujikimu kimaisha kwa upande wa chakula na vyanzo vya mapato zitaathiriwa na Mradi wa SGR wa Uvinza – Kigadye. Jedwali 0 4 linatoa idadi ya viwanja vilivyopotea vilivyotumika kwa shughuli za kilimo. Takriban ekari 1,509.48 zitaathirika kwa ardhi ya kilimo.

Upotevu wa mazao na miti

Aidha, shughuli za ujenzi zitasababisha ufyekaji wa mazao na miti inayolimwa/kupandwa kando ya eneo la mradi. Hizi ni pamoja na mazao ya kudumu ambayo huchukua zaidi ya mwaka mmoja kufikia ukomavu kamili na yanaweza kuvunwa kwa muda mrefu kama vile miti ya matunda (machungwa, ndimu, mipera, maembe, mbuyu n.k. Pia, mazao ya kila mwaka au ya msimu huchukua chini ya miezi sita hadi kufikia ukomavu wa kuvuna kama vile Mahindi, Maharage, Mihogo, Karanga, Mpunga, Alizeti, Pamba, Mtama na Viazi vitaathirika na kuthaminiwa kwa ukubwa wa ekari. Jumla ya miti 2,939 itaathirika.

Kupoteza miundo na mali

Kuna miundo kadhaa ya makazi kando ya njia ya reli iliyopendekezwa ambayo itaathiriwa na mradi huo. Kufuatia matokeo ya uchunguzi wa nyanjani uliofanywa na kuhesabu nyumba tanzu kwenye mstari uliopendekezwa inakadiriwa kuwa takriban nyumba 506 zitaathiriwa kwa njia sahihi na lazima ziondolewe. Kuna makaburi ambayo yataathiriwa na mradi kwa sababu yapo ndani ya njia ya reli. Mchakato wa upataji utafanywa wakati wa uhamasishaji wa mradi. Hili ambalo watu walioathirika watatakiwa kubomoa na kuondoka katika nyumba yao kabla ya kuanza kwa ujenzi. Idadi ya nyumba zitakazoathiriwa imeonyeshwa Jedwali 0 5

Athari kwa miundombinu na huduma za Umma

Uchunguzi ulibaini kuwa kutakuwa na miundombinu ya umma ambayo itaathiriwa na mapendekezo ya maendeleo ya mradi. Athari itakuwa muhimu wakati wa uhamasishaji na ujenzi. Kutakuwa na mabomba ya maji chini ya ardhi na miundombinu ya maji taka katika mji wa Kasulu na wilaya ya Kasulu, hususan katika kambi ya Jeshi la Kujenga Taifa ya Mtabila, shule ya msingi mgogo kijiji cha Katundu wilayani Buhigwe ambayo itaathirika na njia ya SGR inayotarajiwa kutoka Uvinza hadi Kigadye. Kijiji. Jedwali namba 6-6 linaonyesha miundombinu na mali zinazoweza kuathiriwa na mradi wa SGR unaopendekezwa.

Kuongezeka kwa kiwango cha uhalifu na ukosefu wa usalama

Uhalifu na ukosefu wa usalama kwenye tovuti za ujenzi ni shida ya kawaida. Hata hivyo, wakati wa awamu ya uhamasishaji wa mradi inaweza kuwa na athari hasi, ya muda mfupi kwa viwango vya uhalifu na ukosefu wa usalama katika eneo hilo. Athari kuu mbaya ya muda mrefu ya maendeleo inayopendekezwa inaweza kuhusishwa na kufurika kwa watu wakati wa awamu za ujenzi na uendeshaji. Wakati wa awamu ya ujenzi, watu zaidi kutoka sehemu tofauti za nchi hizo mbili wataajiriwa na mradi kufanya kazi katika hatua tofauti za ujenzi wa reli. Kadiri watu wengi wanavyohamia katika eneo hilo maovu ya kijamii kama vile uhalifu, wizi wa vifaa vya ujenzi na mali nyinginezo, ulevi na ulegevu wa kingono/ ukahaba una uwezekano wa kutokea, kwani wanahusishwa na wafanyakazi wahamiaji wanaoishi peke yao, mbali na familia zao. Watu hawa watakuwa wavivu na wana uwezekano wa kulazimika kuiba baadhi ya miundombinu iliyobomolewa ili kujipatia kipato.

Mabadiliko katika sifa za Kidemografia

Makazi katika sehemu nyingi za eneo la mradi kwa upande wa Tanzania ni wengi wa vijijini na kwa hivyo idadi ya watu kwa ujumla ni ndogo na makazi yaliyotawanyika. Kwa kuzingatia udogo wa jamii nyingi na msongamano wa watu nchini Burundi, kufurika kwa wafanyakazi kutoka sehemu zingine za nchi wakati wa awamu ya ujenzi kutaathiri pakubwa demografia ya jamii, sio tu kwa idadi ya watu lakini pia katika masharti ya muundo wa idadi ya watu. Mwisho utakuwa kazi ya asili ya kuchagua ya uhamiaji ambayo mara nyingi hutawaliwa na idadi ya wanaume wazima. Shughuli ya ujenzi bila shaka itaathiri uwiano wa jinsia wa jamii kwa kipindi ambacho shughuli hiyo inafanyika katika jamii fulani. Uwiano wa usawa wa kijinsia unaweza kuhusishwa na masuala kama vile unyanyasaji dhidi ya wanawake na ushirikiano wa wapenzi jambo ambalo linaweza kuongeza kasi ya kuenea kwa magonjwa ya kuambukiza kama vile VVU/UKIMWI.

Kuongezeka kwa ajali, hatari na vihatarishi

Ujenzi wa njia ya reli inayopendekezwa utajumuisha kufanya shughuli kadhaa zinazohusisha uendeshaji wa mitambo ya mashine na vifaa vizito ambavyo vinaweza kukabiliwa na ajali, hatari na hatari. Hatari na hatari pia zitatokea wakati wa awamu ya

uhamasishaji hasa kuhusiana na umbali mrefu wa kilio cha vifaa vya ujenzi kutoka kwa mashimo/machimbo ya mbali.

Maeneo yenye uwezekano mkubwa wa kutokea kwa ajali, hatari na hatari ni pamoja na Rungwe Mpya kuzunguka bonde la mafuriko, kivuko cha Mto Malagarasi ambapo ujenzi wa njia ya reli utahusisha matumizi ya njia kadhaa na madaraja makubwa. Wakati wa uendeshaji wa mradi hatari na hatari pia zitahusishwa na umwagikaji wa mafuta kwenye vituo, warsha na madaraja ambayo yanaweza kusababisha uchafuzi wa maji na udongo

Kuongezeka kwa migogoro ya matumizi ya ardhi

Mradi unaopendekezwa wa njia ya reli ungepata kiasi kikubwa cha ardhi, ambapo isipofanywa ipasavyo, mchakato wa kutwaa ardhi unaweza kusababisha migogoro mikubwa ya matumizi ya ardhi. Vyanzo vikuu vya migogoro vinaweza kutokana na fidia isiyo ya haki na kucheleweshwa kwa malipo. Athari hii itakuwa muhimu sana kwa ukubwa na muda, na haiwezi kutenduliwa kwa sababu mradi ardhi inachukuliwa na mradi itakoma kufikiwa na jamii. Migogoro ya matumizi ya ardhi pia huenda ikatokea kutokana na mahitaji makubwa ya ardhi kwa watu ambao wangependa kukaa kando ya njia ya reli kwa ajili ya kilimo na biashara ikiwa ni pamoja na kutafuta ajira.

Seti nyingine ya migogoro ya matumizi ya ardhi inaweza kusababishwa na maendeleo ya Uvinza. Ingawa katika mradi huu hakuna maendeleo yaliyopangwa katika kituo cha sasa cha Uvinza. Inafikiwa kuwa maendeleo hayo yanaweza kufanywa kama sehemu ya maendeleo yanayoendelea ya Standard Gauge ya reli ya Dar es Salaam/Kigoma. Maendeleo kama haya yanaweza kujumuisha uchukuaji wa ardhi zaidi kwa ajili ya ujenzi wa miundombinu zaidi ya vituo vya reli pamoja na miundombinu mingine ya umma na ya kibinafsi. Kwa sababu hiyo, kituo kinaweza kukua kwa kasi na ardhi inaweza kuwa na mahitaji makubwa, na hivyo kusababisha athari za matumizi ya ardhi.

Mabadiliko ya thamani ya ardhi

Awamu ya uhamasishaji itahusisha utwaaji wa ardhi. Ardhi hii kwa sasa inatumiwa na jamii na taasisi mbalimbali kama vile kilimo, makazi na huduma za kijamii kama vile shule na huduma za afya. Kwa kuwa ni mradi wa mstari wa upana wa mita 60 na unaochukua takriban kilomita 156 kwa urefu, athari zingeonekana kwa njia tofauti kwenye njia. Mabadiliko ya thamani ya ardhi yangukuwa makubwa sana na ya muda mrefu katika maeneo ya mijini kuliko vijijini.

Mradi huo una uwezekano wa kuvutia watu wengi zaidi kwenye ukanda mpya wa reli na hivyo kusukuma mahitaji ya ardhi na rasilimali nyingine katika viwango vya juu ambavyo huenda visiweze kumudu nafuu kwa wakazi wengi wa eneo hilo. Ipasavyo, gharama ya ardhi na rasilimali muhimu (mahitaji ya kimsingi) na uharibifu wa mazingira inaweza kuwa kubwa na kujumuisha gharama kubwa kwa jamii. Mabadiliko ya thamani ya ardhi pia yanatarajiwa kutokana na mahitaji ya ardhi karibu na njia ya reli kwani watu kadhaa wakiwemo wafanyakazi wa reli wangeanza kunyakua ardhi kwa ajili ya uwekezaji karibu na njia ya reli na pia kwa makazi. Tatizo hili linawezekana kuwa kubwa na la muda mrefu.

Uchafuzi wa kelele

Wakati wa awamu za uhamasishaji na ujenzi, viwango vya kelele katika maeneo ya mradi na maeneo yanayozunguka vitaongezeka kutokana na shughuli za mashimo/machimbo ambayo yanawezekana kuwa ndani au karibu na makazi ya watu, na shughuli za ujenzi ambazo zitahusisha matumizi ya mashine na vifaa. Hizi zinaweza kujumuisha mashine za kubana, magari ya kubebea mizigo yenye kuleta nyenzo kwenye tovuti, vichanganyiko vya zege, mashine za kuchimba visima, mashine ya kulehemu, chuma na mashine za kukata mbao, n.k. Kwa hivyo, kelele nyingi zinaweza kutokea kwa mfano wakati wa kulehemu, kuchoma, kukata mbao au chuma na wakati magari yanapakua vifaa vya ujenzi kama mchanga, changarawe, nk. Kelele nyingi zitaathiri wafanyikazi wa mradi na jamii za upande wa reli. Athari ya kelele inayohusishwa na kazi ya ujenzi itakuwa ya muda mfupi na itaisha baada ya shughuli za ujenzi. Hata hivyo, athari ya muda mrefu ya kelele itasikika wakati wa awamu ya operesheni inayohusishwa na kusongeshwa kwa injini za treni hasa kwa jamii zinazoishi kando ya ukanda wa reli.

Kuongezeka kwa hatari ya kupata VVU/Magojwa ya ngono

Tanzania imetangaza VVU/UKIMWI kama janga la kitaifa. Gonjwa hilo limeathiri sekta zote za uchumi na vita vinaonekana kuwa mbali sana kumaliza. Wakati wa mashauriano ya wadau, idadi kubwa ya halmashauri za wilaya ya Uvinza na Kasulu ilikiri kuwepo kwa VVU/UKIMWI.

Ujenzi wa reli na huduma zake utaongeza uhamaji, uhamaji na mwingiliano wa watu, jamii na mataifa kwa ujumla. Hii inaweza kuongeza maambukizi ya magonjwa ya kuambukiza kama vile VVU/UKIMWI na magonjwa mengine ya ngono. Kwa kuzingatia hatari ya magonjwa inatabiriwa kuwa hatari iko juu sawa katika awamu zote nne za mradi. Ikumbukwe kuwa mradi huu hautaleta VVU/UKIMWI katika wilaya lakini hatari ya kueneza ugonjwa huo ni kubwa sana kwani hata mtu mmoja akiambukizwa hilo linapaswa kuwa jambo la kutia wasiwasi.

Shinikizo kwa huduma za kijamii za ndani

Vijiji vingi vilivyotembelewa vilivyo karibu na njia ya reli havikuwa na huduma za kutosha na hali kwa ujumla ilikuwa mbaya katika huduma za afya na huduma za maji ili kukidhi mahitaji ya watu waliopo na wanaotarajiwa kuongezeka. Kuongezeka kwa idadi ya watu kutaweka shinikizo zaidi kwa huduma zilizopo ili kukidhi mahitaji. Shinikizo kwa huduma za kijamii litatokea katika awamu zote za mradi lakini itakuwa muhimu zaidi wakati wa awamu ya ujenzi wa mradi. Ujenzi na uendeshaji wa reli unahusishwa na ajali, hatari na hatari, kwa sababu hiyo, huduma za kijamii kama hospitali na miundombinu ya maji inapaswa kupatikana vya kutosha.

Shinikizo kwenye rasilimali za maji

Shinikizo la rasilimali za maji litatokea kutokana na kuongezeka kwa mahitaji ya rasilimali hiyo kutoka kwa watu mbalimbali watakaohusika na kazi za ujenzi na wale watakaokuja kutoa huduma kwa wafanyakazi pamoja na kazi za ujenzi wa reli. Eneo la

mradi lina maji mengi kutoka mito na vijito vinavyopita kwenye upangaji wa SGR, haya yanatumiwa na wanajamii kwa matumizi mbalimbali yakiwemo matumizi ya nyumbani. Wakati wa awamu za ujenzi, uchukuaji wa maji na matumizi ya mradi unaweza kuweka shinikizo kwenye vyanzo na rasilimali za maji. Shida kama hiyo ya maji inaweza kutokea ikiwa uondoaji na utumiaji hautazingatia watumiaji wa mto. Skimu ya umwagiliaji ya mpunga katika Rungwe mpya katika Wilaya ya Kasulu - Kigoma Tanzania ni mifano ya watumiaji wa mkondo wa chini ambao wana uwezekano wa kuathiriwa na mradi ikiwa utekaji maji uliopangwa ipasavyo hautafanyika na kufuatwa.

Athari kwa Afya na Usalama Kazini

Shughuli za kawaida zinazofanywa wakati wa ujenzi kama vile usafirishaji wa mashine nzito, ubomoaji na uchimbaji, kazi za umeme na kazi zinazofanywa kwa urefu, zote zinaweza kuleta hatari kubwa kwa afya na usalama wa nguvu kazi ya ujenzi. Hatari zinazohusiana kutokana na ajali na matukio zinaweza kuathiri afya na usalama wa wafanyakazi na wengine kwenye ujenzi wa vituo, uzalishaji wa vyumba vya kulala na mimea/maeneo ya mradi. Kwa kuwa eneo la maeneo mengi ya ujenzi litakuwa mbali na vituo vya matibabu, vifaa vya huduma ya kwanza visivyofaa kwenye tovuti vinaweza kuathiri afya na usalama wa wafanyakazi na wengine.

Wakati wa utendakazi wa mradi unaopendekezwa wa SGR utajumuisha hatari za kimwili, hatari za kemikali na hatari za kimwili za kelele. Hatari za kemikali katika utendakazi wa reli na wafanyakazi wa matengenezo zinaweza kukabiliwa na aina mbalimbali za hatari za kimwili kutokana na mashine zinazoendesha na treni zinazosonga lakini pia kufanya kazi katika mwinuko kwenye madaraja na njia za juu. Uendeshaji wa njia ya reli, ambayo inaweza kusababisha athari kama vile uzalishaji wa kelele na mtetemo, kutolewa kwa kemikali, mafuta au dutu hatari kutoka kwa trafiki ya mizigo, kuua wanyama wanaovuka, uzalishaji wa mikondo ya taka mbalimbali; na shughuli za matengenezo ya treni/njia au mfumo wa uwekaji umeme, ambayo inaweza kusababisha athari kama vile afya na usalama kazini kwa wafanyakazi ambao watafanya matengenezo ya mara kwa mara ya reli na usalama wa umma wakati wa matengenezo.

Aidha, wakati wa operesheni wafanyakazi wanaweza kukabiliwa na aina mbalimbali za hatari na shughuli hatari na mazingira ya kazi ambayo yanaweza kuathiri afya ya binadamu. Hatari na hatari ni pamoja na zile zinazohusiana na uhamishaji wa hisa, uendeshaji na matengenezo ya injini za reli, na upakiaji na upakuaji wa vifaa huunda treni. Wafanyakazi wanaweza pia kuathiriwa na mafusho na kemikali zinazohusika katika uendeshaji wa treni au katika ukarabati na usafishaji. Wafanyakazi wanaohusika katika shughuli za matengenezo ya reli wanaweza pia kukabiliwa na hatari na hatari za afya ya binadamu zinazolinganishwa na wale wanaohusika na ujenzi, pamoja na hatari ya kugongwa na treni wakati wa kufanya shughuli za matengenezo kwenye au karibu na njia ya reli

Athari kwa afya na usalama wa jamii

Masuala ya afya na usalama ya jamii yatajitokeza wakati wa ujenzi wa SGR, Uvinza - Kigadye. Madhara hayo yatajumuisha vumbi, kelele, na mtetemo kutoka kwa usafiri wa

magari ya ujenzi, na magonjwa ya kuambukiza yanayohusiana na kufurika kwa kazi ya muda ya ujenzi. Masuala muhimu ya afya na usalama ya jamii yanayohusiana na mradi uliopendekezwa yatajumuisha usalama wa watembea kwa miguu na usalama wa trafiki.

Watembea kwa miguu na waendesha baiskeli wako katika hatari kubwa zaidi ya majeraha mabaya kutokana na kugongana na magari yanayosonga. Watoto kwa ujumla watakuwa hatarini zaidi kwa sababu ya ukosefu wa uzoefu na ujuzi wa hatari zinazohusiana na trafiki, tabia zao wakati wa kucheza, na udogo wao unaowafanya wasionekane sana na madereva. Migongano na ajali zinaweza kuhusisha gari moja au nyingi, watembea kwa miguu au waendesha baiskeli na wanyama. Sababu nyingi huchangia ajali za barabarani. Baadhi yanahusishwa na tabia ya dereva au ubora wa gari, hali ya barabara (katika kesi hii barabara za changarawe za vumbi) au masuala ya ujenzi na matengenezo.

Ongezeko la wafanyikazi kwa ajili ya ujenzi wa mradi wa SGR huenda likaongezea hatari ya magonjwa ya kuambukiza na mzigo kwa huduma za afya za mitaa: Mmiminiko wa watu unaweza kuleta magonjwa ya kuambukiza katika eneo la mradi, ikiwa ni pamoja na Covid 19, kipindupindu na magonjwa mengine ya zinaa (STDs). Pia, wafanyakazi wanaoingia wanaweza kuwa wazi kwa magonjwa ambayo wana upinzani mdogo. Hii inaweza kusababisha mzigo wa ziada kwa rasilimali za afya za ndani

Athari kwa Ukatili wa Kijinsia na Unyanyasaji (GBVH)

Awamu za uhamasishaji na ujenzi zitahusisha shughuli kadhaa zikiwemo ununuzi wa ardhi, uajiri wa vibarua na uondoaji wa maeneo. Mfumo wa Uendeshaji wa 5 unasisitiza juu ya Kutobagua na Fursa Sawa na inahitaji mtetezi wa mradi kutofanya maamuzi ya ajira kwa misingi ya sifa za kibinafsi zisizohusiana na mahitaji ya asili ya kazi. Pia inasisitiza kwamba uhusiano wa ajira unapaswa kuegemezwa kwenye kanuni ya fursa sawa na kutendewa kwa haki, na hautabagua kuhusiana na vipengele vyovyote vya uhusiano wa ajira.

• *Utwaaji wa Ardhi na Wanawake*

Upatikanaji wa ardhi ni mojawapo ya shughuli muhimu zaidi wakati wa awamu ya uhamasishaji. Ardhi itachukuliwa kwa ajili ya ujenzi wa tuta la njia, maeneo ya kambi, mashimo ya kukopa, maeneo ya kutupa taka, maeneo ya machimbo, vituo na barabara za kuingia. Sera ya Jinsia ya AfDB inahitaji kwamba uchanganuzi wa jinsia uwe sehemu muhimu ya afua zote za Benki ili kuhakikisha kwamba afua kama hizo zinakidhi mahitaji na vipaumbele vya wanaume na wanawake. Sharti hili linatokana na dhana kwamba kutokuwepo kwa umakini maalum kwa tofauti kati ya wanawake na wanaume kumeonekana kusababisha kutengwa kwa wanawake au wanaume kama washiriki au wanufaika wa mabadiliko yaliyopangwa.

Kulingana na utafiti wa kimsingi haki ya wanawake kumiliki na kurithi ardhi ni mojawapo ya masuala muhimu yanayohusiana na uwezeshaji wa wanawake kiuchumi. Nchini Tanzania na hasa katika eneo la mradi, upatikanaji wa ardhi ni muhimu kwa uzalishaji wa chakula na kipato na chanzo cha nguvu na hadhi ya kijamii (SIDA, 2015); katika maeneo ya vijijini maisha mengi ya wanawake yanategemea karibu kabisa ardhi yao.

Wakati wanawake wana haki sawa na wanaume, chini ya sheria ya Tanzania, kumiliki na kudhibiti ardhi, ni nadra sana wanawake kununua ardhi (UNA Tanzania, 2017). Taratibu za kimila nchini Tanzania mara nyingi zinahitaji wanawake kupata ardhi kupitia baba zao, kaka, waume zao, au wanaume wengine (Guardian, 2014). Ni asilimia 24 tu ya wanawake wa Tanzania wanaripoti kuwa wanamiliki ardhi peke yao au kwa pamoja na mtu fulani, wakati asilimia 9 tu ya wanawake wanamiliki nyumba au ardhi pekee (Ofisi ya Taifa ya Takwimu Tanzania, 2016). Katika hali ambayo wanawake hawana uwezo wa kufanya maamuzi kuhusiana na umiliki wa ardhi, kuna uwezekano kwamba utekelezaji huo utaathiri maisha yao.

- ***Ajira ya watoto na shule kuacha shule***

Moja ya malengo ya kanuni za uendeshaji za Benki ya maendeleo ya Africa ni kuwalinda wafanyakazi; inahusika na hali ya wafanyakazi, haki na ulinzi dhidi ya unyanyasaji au unyonyaji. Inashughulikia mazingira ya kazi, mashirika ya wafanyakazi, afya na usalama kazini, na kuepusha watoto au kazi ya kulazimishwa. Mfumo wa Uendeshaji wa 5 unamtaka mteja kutoajiri watoto kwa njia yoyote ambayo ni ya kuwanyonya kiuchumi, au ina uwezekano wa kuwa hatari au kuingilia elimu ya mtoto, au kuwa na madhara kwa afya ya mtoto au kimwili, kiakili, kiroho, kimaadili, au maendeleo ya kijamii kama yatatumika kwa mujibu wa masharti ya serikali. Kuna taratibu za kufuata ili kuhakikisha haki ya mtoto itazingatiwa katika eneo la mradi. Ushahidi kutoka katika utafiti wa nyanjani wa TAM unaonyesha kuwa utumikishwaji wa watoto bado unaendelea kwa sababu watoto wanatumika kwa njia nyingi kama kazi ya kilimo, malisho ya mifugo, uchimbaji mdogo wa madini na shughuli. Hii inapunguza fursa za mtoto kwenda shule na kutishia afya zao. Ushahidi pia umeonyesha kuwa kuacha shule kwa ajili ya shule za msingi na sekondari ni jambo la kawaida katika eneo la mradi, kwa hiyo, ikiwa hatua za kuepuka utumikishwaji wa watoto hazitatekelezwa na mradi huo, kuna uwezekano kuwa kuacha shule kwa watoto kutaongezeka.

- ***Unyanyasaji wa kijinsia***

Sekta ya ujenzi, hasa ya miradi mikubwa ya miundombinu, kama mradi wa SGR unaopendekezwa kutoka Uvinza hadi Kigadye inaweza kuwa mazingira hatarishi kwa GBVH inayoathiri wanajamii, wafanyakazi na watumiaji wa huduma. Hatari za GBVH zinaweza kuongezeka ndani ya jumuiya za wenyeji wakati kuna ongezeko kubwa la wafanyakazi wa kiume kutoka nje ya eneo hilo. Wafanyakazi kama hao mara nyingi huja bila familia zao na wana mapato makubwa yanayoweza kutumika kulingana na jamii ya eneo hilo, na wanaweza kuweka hatari katika suala la unyanyasaji wa kijinsia, unyanyasaji na uhusiano wa unyonyaji wa shughuli. Hatari hizi ni kubwa zaidi pale ambapo wafanyakazi hukutana kwa karibu na jumuiya ya eneo hilo, kwa mfano kwenye kambi ya wafanyakazi iliyo karibu na vitongoji vya makazi. Wakati wa awamu ya ujenzi, wafanyakazi pia wako katika hatari ya aina mbalimbali za unyanyasaji, unyonyaji na unyanyasaji, unaochochewa na mazingira ya kazi ya kijadi ya wanaume. Uwezekano wa athari unawezekana sana kwani umaskini wa jamaa wa wanawake na watoto hutengeneza mazingira ambayo wanaweza kunyonywa na kunyanyaswa.

Kuongezeka kwa shinikizo na uvamizi wa malisho

Kama ilivyoonyeshwa katika msingi wa kijamii na kiuchumi, ufugaji ni muhimu kiuchumi katika mradi wa SGR wa Uvinza hadi Kigadye, hasa katika vijiji vya Msebei, Rugwe Mpya, Sogeeni Kwiliba, Ruhita, Lugoma, Katonga, Heru Ushingo na Kigadye. Wafugaji wanatumia mfumo wa 'rubaga' ambapo ng'ombe huhamishwa kwa muda kutafuta malisho na maji wakati wa kiangazi. Mabadiliko kama haya mara nyingi husababisha uvamizi wa hifadhi za misitu na maeneo ya vyanzo vya maji kwa vyanzo vikuu vya maji. Ujenzi wa tuta la njia na vifaa vinavyohusiana na uendelezaji vitaleta tishio la kuongezeka kwa malisho na uvamizi wa ardhi ya malisho. Kwa sababu ya shughuli za ujenzi, ajira na kuboreshwa kwa uchumi wa watu karibu na eneo kunaweza kuathiri uvumi na mauzo ya ardhi. Baadhi ya maeneo ambayo yanaweza kuvamiwa ni maeneo ya ukanda wa mifugo, malisho na maeneo ya malisho kwa sababu ya ukaribu wao na mpangilio wa mradi na vituo.

Kugawanyika kwa ardhi ya malisho na usumbufu

Mpangilio wa SGR na baadaye tuta la lori linaanzia Uvinza hadi Kigadye kupitia ardhi ya mijini na vijijini. Ardhi inayopitiwa na mradi huo kwa kawaida hutumiwa na wafugaji kwa madhumuni tofauti ikiwa ni pamoja na malisho, njia za mifugo, vituo vya maji, maeneo matakatifu na makazi. Baadhi ya vijiji vimeandaa mpango wa matumizi bora ya ardhi unaoonyesha maeneo yaliyotengwa kwa ajili ya malisho, kilimo na makazi. Ujenzi wa tuta la reli na vifaa vingine vinavyohusika vitaingilia na kutenganisha jamii na rasilimali zinazotumiwa na wafugaji na jumuiya.

Uharibifu na uchafuzi wa vyanzo vya maji kwa mifugo

Ujenzi wa tuta kutoka Uvinza hadi Kigadye utapita katika maeneo yanayokaliwa na kutumiwa na wafugaji na wafugaji wengine. Itapitia vyanzo vya maji ikiwa ni pamoja na mito, maji yaliyosimama kama visima na chemchemi za maji. Shughuli za ujenzi kama vile uchimaji, uondoaji wa maeneo, usafirishaji wa magari na usafirishaji wa vifaa vya mradi zitakuwa na athari mbaya, haswa uharibifu na uchafuzi wa vituo vya maji na vyanzo vinavyotumiwa na wafugaji. Baadhi ya vyanzo muhimu vya maji ambavyo vina uwezekano wa kuathirika au kuchafuliwa ni pamoja na mito ya Malagarasi, Ruchugi na Mgera.

Mitetemo

Uhamasishaji wa vifaa (awamu ya uhamasishaji), ujenzi wa barabara za kuingilia na vichuguu (awamu ya ujenzi), na usafirishaji wa mizigo na abiria (awamu ya operesheni) utahusisha vifaa na mashine nzito kama vile tingatinga na viwavi. Shughuli hizi zitahusishwa na kelele na mtetemo. Mtetemo wa ardhini unaweza kuzalishwa na mizigo ya ekseli tuli inayosogea kando ya njia au kwa nguvu zinazobadilika zinazotokana na hitilafu za gurudumu na kufuatilia kutokana na uendeshaji wa mradi, ambao una uwezekano wa kuendelea kwa miaka mingi katika siku zijazo. Tatizo linaweza kuwa kubwa zaidi pale ambapo reli inavuka maeneo yenye watu wengi ikiwa ni pamoja na maeneo ya mijini ambapo kwa kawaida husababisha usumbufu kwa wakaaji katika

majengo ya karibu au katika hali mbaya zaidi, husababisha uharibifu wa majengo au miundo mingine.

Mmomonyoko wa ardhi

Usafishaji wa njia ya kulia ya reli (ROW) wakati wa awamu ya uhamasishaji na ujenzi wa barabara za kuingilia kungeweka wazi moja kwa moja udongo wazi kwenye mkondo wa maji na mmomonyoko wa ardhi (haswa ikiwa unafanywa wakati wa mvua). Athari hizo zingehusishwa kwa kiasi kikubwa na maeneo ya milima k.m. karibu na eneo la Msebei, Nyakitonto, Buhoro, Katundu na Kigadye. Athari kwa kiasi kikubwa inaweza kuwa mabaki na inaweza kuchangia mafuriko ya maji ya kupokea maji wakati wa msimu wa mvua.

Upotezaji wa makazi

Kanuni ya uendeshaji (OS3) unatambua kuwa ujenzi na matengenezo ya reli inaweza kusababisha mabadiliko na usumbufu kwa makazi ya nchi kavu na majini. Uendelezaji wa yadi ya Marshalling eneo la Uvinza na vituo mbalimbali vya treni kama vile Uvinza, Mutinde, Kasulu, na Shunga (kituo cha mpakani), na yadi husika za mizigo zitasababisha upotevu wa makazi na/au kusababisha mabadiliko ya makazi hasa katika maeneo oevu (kuvuka Mito ya Ruchugi, Mgera na Malagarasi) na zile zilizoko kwenye maeneo ya hifadhi. Vile vile, uondoaji wa eneo kwa ajili ya uoto kwa ajili ya kuanzisha njia ya SGR, ujenzi wa yadi na vituo na yadi za mizigo na vifaa vinavyohusika kutaondoa uoto wa nchi kavu ambao ni makazi ya mamalia wakubwa hadi wadogo na pia ndege wanaochangia upotevu na / au mabadiliko ya makazi. Jumla ya eneo la ardhi litakaloondolewa kwenye maeneo ya hifadhi ya msitu wa Masanza kwa madhumuni ya kuanzisha njia ya SGR itakuwa takriban 18000 m² sawa na 1.8 km².

Uharibifu wa maeneo ya ardhievu

Maeneo yaliyotengwa kwa ajili ya ujenzi wa Uvinza-Kigadye SGR pamoja na miundombinu inayohusiana nayo yanavuka maeneo ya ardhievu. Ardhievu tatu muhimu zimevukwa na mradi unaopendekezwa wa SGR; Mto Rungwe mpya, Mto Ruchugi na Mto Malagarasi. Ardhievu hizi ni makazi ya viumbe vya majini. Shughuli za kusafisha tovuti zinazofanyika wakati wa uhamasishaji na uhamishaji wa mashine na magari ndani ya tovuti huenda zikaondoa ardhievu na uharibifu na/au kubadilisha sifa za makazi za tovuti hizi. Pia, wakati wa ujenzi wa matuta na mifereji ya maji inayovuka ardhievu hii inaweza kusababisha mabadiliko ya baadhi ya maeneo oevu na kuvuruga kazi zao za kiikolojia. Tathmini ya athari imezingatia ukubwa wa uharibifu wa ardhievu unaofanywa na mradi kama juu kutokana na ukubwa wa ardhievu unaopaswa kupikwa na idadi. Kiwango cha kuenea kwa ardhievu ya Malagarasi ni kuvuka mipaka huku athari kwenye Ruchugi na Mto Rungwe mpya inaweza kuwa na athari hadi ziwa hivyo kuathiri ziwa linalovuka mpaka. Kwa hivyo, utekelezaji wa shughuli za ujenzi unaweza kubadilisha kabisa makazi ya ardhievu. Uwezekano wa kutokea kwa mabadiliko na uharibifu wa makazi ya ardhievu wakati wa uhamasishaji na awamu ya ujenzi ni wa kudumu na hauwezi kutenduliwa lakini hatari hiyo inakadiriwa kuwa kubwa kutokana na ukubwa ulioathiriwa na kuathiri kuvuka mipaka.

Upotevu wa bioanuwai

Upotevu wa bioanuwai utatokana na athari nyingi za kusafisha eneo la reli, mgawanyiko wa makazi, upotevu wa makazi na/au mabadiliko na kuenea kwa mimea vamizi na mauaji ya moja kwa moja kutokana na kukanyagwa na ajali. Upotevu wa viumbe hai unaotokana na kazi za uhamasishaji kwenye maeneo yaliyochaguliwa kwa ajili ya ujenzi wa SGR Uvinza –Kigadye. Mpangilio unaovuka hifadhi ya msitu wa Masanza, ardhievu kwenye Mto Ruchugi, Rungwe mpya na Malagarasi umethibitika kuwa na idadi kubwa ya wanyama kama ilivyoelezwa katika hali ya awali. Hasara kubwa kwa bayoanuwai pia itachangia upotevu wa spishi zinazotambuliwa na IUCN kama hatarishi. Hifadhi ya msitu wa Masanza ina rekodi za tembo waliotembelea msimu wa mvua kutoka Ranchi ya Uvinza iliyounganishwa na pori la akiba la Muyowozi. Wanyama kama Tembo, Chui, Kakakuona, Pundamilia, Simba na Fisi.

Hatari ya kuongezeka kwa kuenea kwa mimea vamizi

Hatari ya kuenea kwa viumbe vamizi huenda ikaathiri sana kazi ya ujenzi wa SGR ya Uvinza-Kigadye inayohusisha ukusanyaji wa vifaa vya ujenzi kutoka vyanzo mbalimbali vilivyoainishwa ambavyo baadhi vina uwezekano wa kuwa kwenye mashamba, maeneo ya malisho na vingine karibu na maeneo ya makazi ambayo tayari yameathiriwa. aina tofauti za spishi vamizi. Ziara ya tovuti na uchunguzi wa maandishi ulirekodi idadi ya spishi vamizi ndani ya maeneo ya mradi,

Ukataji miti na kugawanyika kwa makazi

Ujenzi wa mradi wa reli katika maeneo yaliyotambuliwa utasababisha ukataji miti na kugawanyika kwa makazi kutokana na kuondolewa kwa mimea. Kama ilivyobainishwa katika sehemu ya hali ya msingi eneo la mradi linapitia katika eneo lenye mimea mingi yenye idadi kubwa ya maeneo yaliyohifadhiwa. Kilomita 3 za kwanza za ukanda huu hupitia msitu wa hifadhi ya Masanza unaopakana na Mkuti kaskazini na Lugufu kaskazini magharibi mwa Masanza. Kusini mwa kilomita sifuri kwa njia ya Uvinza – Kigadye ni msitu wa hifadhi wa Uvinza kusini. Uwepo wa hifadhi katika maeneo hayo hufanya eneo la uvinza kuwa eneo muhimu la uchambuzi wa makazi kama kitengo cha usimamizi wa kipekee (DMU). Misitu hii ina sifa ya pori la miombo linaloanguka chini ya mpito kati ya kitovu cha eneo la Zambezian na kitovu cha Guinea - Kongo ambacho ni sehemu ya Greater African Subequatorial Savannas & Mixed Woodlands (AT11). Usafishaji wa mimea katika maeneo haya utakata eneo hilo na kusababisha mgawanyiko wa makazi. Ukataji miti na mgawanyiko wa makazi unaosababishwa na uanzishwaji wa vituo vilivyopewa majina utaongeza msitu ambao tayari umegawanyika unaosababishwa na kibali kinachoendelea kwa kilimo, uanzishwaji wa makazi na eneo la malisho na uchomaji mkaa. Kuondolewa kwa mimea katika makazi yenye kuendelea kutagawanyika na kutenganisha spishi zinazonufaika na makazi endelevu na kuwafanya kuwa katika hatari ya kutoweka.

Hatari ya kuingiliwa kwa korido za harakati za wanyamapori

Hatari ya kuingiliwa na mienendo ya wanyamapori itakuwa na athari kubwa kwa SGR ya Uvinza-Kigadye kwani upangaji na kituo cha Mutinde viko katika eneo ambalo harakati na kuvuka kwa wanyamapori zilibainika. Eneo kati ya vijiji vya Basanza hadi Kaguruka lilitambuliwa kama njia ya kuvuka tembo. Tembo kutoka pori la akiba la Muyowozi wakihamia katika ranchi ya wanyamapori ya Uvinza wakipita kwenye korido ya reli hadi msitu wa Mkuti-Lugufu na hifadhi ya Masanza. Ujenzi wa vipengele

mbalimbali vya mradi utaingilia kati na pengine kuzuia harakati za wanyamapori katika eneo la mradi. Eneo la Uvinza –Kigadye SGR linatenganisha ranchi ya wanyamapori ya Uvinza inayoungana na pori la akiba la Muyowozi upande wa mashariki na misitu ya hifadhi ya Mkuti, Lugufu na Masanza upande wa magharibi. Kwa kuwa ukanda wa SGR utakuwa na uzio, utazuia tembo wasitembee kati ya maeneo yaliyotajwa. Athari kubwa inakadiriwa kuwa kuu bila hatua za kupunguza, hata hivyo kwa utekelezaji wa hatua zinazofaa za kupunguza athari inaweza kupunguzwa hadi wastani.

Kupotea/kupunguzwa kwa Huduma za Mfumo ikolojia

Mfumo wa Uendeshaji 3 unatambua kuwa upotevu wa huduma za mfumo ikolojia na/au ufikiaji wa huduma za mfumo ikolojia unaothaminiwa na binadamu unasisitiza upotevu wa rasilimali za viumbe hai. Utekelezaji wa ujenzi wa SGR ya Uvinza-Kigadye kwenye maeneo yaliyotambuliwa huchangia katika ufyekaji wa uoto unaotoa huduma ya makazi kwa spishi za wanyama, kunyima malisho, kutoa vyanzo vya kuni na vifaa vya ujenzi kwa jamii zinazoishi kando ya ukanda wa SGR. Uchambuzi wa kimsingi umebaini kuwa sehemu kubwa ya eneo la mradi limefunikwa vyema na uoto wa asili wa miombo, nyasi wazi, ardhi oevu hadi mashamba. Uwepo wa makazi asilia kama vile pori la miombo ambalo limethibitisha kuwa na wanyamapori wengi kama inavyoonyeshwa katika sehemu ya msingi. Vile vile uchunguzi wa awali umebaini jamii ya wenyeji kunufaika na aina mbalimbali za huduma za mfumo wa ikolojia, ukusanyaji wa kuni, vifaa vya ujenzi (mianzi), uvuvi, uvunaji wa mashamba, malisho ya mifugo, uchomaji mkaa na kilimo kwenye maeneo oevu na maeneo mengine ya asili ambayo ni chanzo cha maisha. Idadi kubwa ya ufugaji wa nyuki ambao unategemea tu maeneo ya misitu karibu na jamii ilibainika karibu na Mati Mubondo, Masanza, Kagaruka na Rungwe mpya. Usafishaji wa mimea kwa ajili ya kuanzisha SGR utaathiri huduma za mfumo ikolojia kwenye ukanda wa SGR unaonufaisha jamii. Athari kubwa imekadiriwa kuwa ya wastani bila hatua za kupunguza; hata hivyo kwa utekelezaji wa hatua zinazofaa za kupunguza athari inaweza kupunguzwa hadi ndogo.

Mmomonyoko wa udongo

Mmomonyoko wa udongo unatarajiwa karibu katika awamu zote za mradi (yaani, uhamasishaji, ujenzi, uendeshaji na uondoaji). Usafishaji wa eneo, uondoaji wa mzigo wa udongo, ujenzi halisi wa tuta, kata na kujaza sehemu ya reli, vivuko vya mito, vijito, miteremko mikali na hasa kwenye miinuko pamoja na usimamizi wa kambi ya wafanyakazi kutachochea mmomonyoko wa udongo na kujaa kwa udongo kwenye vyanzo vya maji. Mmomonyoko mkubwa utatokea wakati ujenzi unafanywa kwenye miteremko ya milima kwa sababu ya mwinuko wa mwinuko na udongo usiunganishwa, hasa ikiwa ujenzi unafanywa wakati wa mvua. Sehemu kati ya Msebei hadi Sogeeni kwiliba, eneo la Jeshi la Mutabila, Buhoro, Katundu, kijiji na kuelekea mpaka na Burundi eneo lenye milima linaloonyesha ukanda huo litasababisha mmomonyoko mkubwa wa udongo.

Mabadiliko ya mandhari na ubora wa mandhari ya eneo hilo

Utekelezaji wa shughuli mbalimbali za mradi kando ya ukanda wa reli utachangia mabadiliko ya mandhari na ubora wa eneo hilo. Shughuli kama vile ufyekaji wa mimea kando ya korido, sehemu ya kukata na kujaza kwenye miteremko na bonde la mto,

uchimbaji wa vifaa vya ujenzi, uanzishaji wa barabara za kuingilia, ulimbikizaji wa mizigo mizito na unyevu wa udongo mbovu utachangia mabadiliko katika mandhari na mandhari ya mradi. eneo.

Uchafuzi wa hewa na mchango katika mabadiliko ya tabia nchi

Mchangiaji mkuu wa mabadiliko ya tabianchi kuhusiana na mradi huu ni uchafuzi wa hewa unaotokana na utoaji wa gesi chafuzi (GHG) kutoka kwa injini za uendeshaji na mashine wakati wa awamu zote mbili za ujenzi wa mradi. Hata hivyo, upunguzaji mkubwa wa hewa chafu (GHG) utatokea wakati wa awamu ya operesheni kwani mradi utawekewa umeme na hivyo kupunguza kwa kiasi kikubwa GHG. Kuimarika kwa shughuli za kilimo na uchimbaji madini kwa kuchochewa na miundombinu/usafirishaji iliyoboreshwa kutapunguza uoto wa asili ambao utasaidia kutwaa GHG inayozalishwa ili kukabiliana na viwango vya uzalishaji.

Athari ya damming/Ponding

Ujenzi wa tuta la reli hasa kwenye maeneo ya chini na yanayokabiliwa na mafuriko kutaleta athari ya bwawa kwani tuta hilo litaweka kizuizi kwa maji yanayotiririka bila malipo. Uundaji wa kizuizi kwa maji ya kusonga bila malipo kutasababisha athari ya mabwawa na mafuriko kwenye upande wa kupokea maji wa tuta. Inayohusishwa na athari ya kuzuia maji ni athari ya risasi inayosababishwa na maji yaliyohifadhiwa kulazimisha njia yao kutoka kwenye mkondo mdogo, kwa sababu hiyo nguvu inayoundwa na maji inamomonyoa upande wa kumwaga wa tuta.

Uharibifu wa barabara na huduma za umma/miundombinu

Ujenzi wa tuta la reli na miundombinu mingine ya reli kama vile mfumo wa mawasiliano utavuruga miundombinu iliyopo kama vile mfumo wa maji, mawasiliano ya simu, kebo ya macho, upitishaji umeme na mfumo wa majitaka hasa mijini. Athari kubwa zaidi itaonekana wakati wa awamu ya ujenzi wa mradi na kusababisha usumbufu mkubwa kwa jamii za wenyeji.

Uzalishaji wa taka za kioevu

Taka nyingi za kioevu zingezalishwa wakati wa awamu zote za mradi (uhamasishaji, ujenzi, uendeshaji na uondoaji). Taka za kioevu zinazozalishwa zitajumuisha taka za nyumbani kutoka kwa ofisi, vituo vya kazi, kambi za kazi na abiria katika vituo vya treni na treni. Pia, taka za hidrokarboni kutoka kwa vilainishi, mafuta taka, mafuta na grisi iliyooshwa kutoka kwa treni, uhamishaji wa matengenezo na kuongeza mafuta itaongeza taka za kioevu zinazozalishwa wakati wa awamu mbalimbali za mradi. Kwa ujumla, maji machafu hujumuisha takriban 80% ya kiasi cha matumizi ya maji; hivyo,

Uzalishaji wa taka za ngumu

Taka ngumu zinazotokana na uondoaji wa tovuti zingeweza kuzalisha kiasi kikubwa cha majani ya mimea ya miti na mzigo mkubwa wa udongo. Takataka ngumu za ziada zitajumuisha takataka (takataka za chakula), takataka (karatasi, kadibodi, mbao, majani ya miti na matawi, chupa, metali, vifaa vya plastiki, ngoma, vyombo, vifaa vya ujenzi, vifungashio, mabaki ya chuma, pedi zinazoweza kufyonzwa na sagi za mafuta.) Nyingine ni taka za matibabu au kliniki kutoka kwa huduma ya kwanza na vituo vya afya ikiwa ni pamoja na taka zinazohusiana na matibabu. Taka hizi ngumu zinahitaji kushughulikiwa ipasavyo ili zisilete madhara kwa binadamu na mazingira.

Uchafuzi wa maji

Athari za kimwili kama vile kuongezeka kwa tope kutokana na kuongezeka kwa mashapo itatokana na uhamasishaji na shughuli za ujenzi. Vile vile, wakati wa awamu ya operesheni ya mradi, maji na uchafuzi wa udongo utatokana na uvujaji unaowezekana, au umwagikaji wa taka ya Hydrocarbon kutoka kwa mafuta ya mashine, mafuta taka, mafuta na grisi.

Kuongezeka kwa ajali, hatari na vihatarishi

Idadi ya shughuli zinazohusisha utendakazi wa mitambo ya mashine na vifaa vizito zinaweza kusababisha ajali, hatari na hatari. Hatari na hatari pia zitatokea wakati wa awamu ya uhamasishaji hasa kuhusiana na umbali mrefu wa usafirishaji wa vifaa vya ujenzi kutoka kwa mashimo/machimbo ya mbali. Maeneo yenye uwezekano mkubwa wa kutokea kwa ajali, hatari na hatari ni pamoja na Rungwe Mpya, Basanza, Nyakitonto, kwenye tambarare za mafuriko na vivuko vya Mito (Malagarasi, Ruchugi, Mgera) ambapo ujenzi wa njia ya reli utahusisha matumizi ya njia kadhaa na madaraja makubwa.

Ushirikishwaji wa wadau

Katiba ya Jamhuri ya Muungano wa Tanzania ya mwaka 1984 Sheria Na. 6 kama ilivyorekebishwa katika Sheria Na. 34 ya 1994 Ibara ya 4 inaweka mbele Uhuru wa kushiriki katika masuala ya umma. Inasisitiza kuwa kila mwananchi ana haki na uhuru wa kushiriki kikamilifu katika mchakato wa kufikia uamuzi wa mambo yanayomhusu yeye, ustawi wake au taifa. Pia, kifungu cha 89 cha Sheria ya Usimamizi wa Mazingira Sura ya 191, kinatoa maelekezo kuhusu masuala ya ushirikishwaji wa wananchi. Sehemu ya 17 ya EIA na Kanuni za Ukaguzi (URT, 2005) inatoa maelezo zaidi na taratibu za ushiriki wa umma katika mchakato wa TAM. Zaidi ya hayo, Ulinzi wa Utendaji 1 wa AfDB juu ya Tathmini ya Mazingira na Kijamii inasisitiza juu ya haja ya Kutoa ushiriki wa wadau wakati wa mchakato wa mashauriano ili jamii zilizoathirika na washikadau wapate taarifa kwa wakati katika fomu zinazofaa kuhusu Benki.

Madhumuni ya mpango wa ushirikishaji wa washikadau ni kutoa ushirikishwaji wenye maana wa washikadau katika kipindi chote cha mradi. Ni kipengele muhimu cha usimamizi mzuri wa mradi na hutoa fursa kwa:

- Kutoa taarifa na nyenzo zinazohusiana na mradi kwa wahusika na wanaovutiwa;
- Kuomba maoni kutoka kwa wadau ili kufahamisha muundo, utekelezaji, ufuatiliaji na tathmini ya mradi;
- Kuimarisha kukubalika kwa mradi kwa kufafanua malengo ya mradi na upeo katika hatua ya awali na kudhibiti matarajio ya wadau;
- Kutathmini na kupunguza mradi na athari za kimazingira na kijamii na hatari; • Kuimarisha manufaa ya mradi;
- Kushughulikia malalamiko ya mradi;

Wakati wa mchakato wa TAM, wadau kutoka ngazi zote (kitaifa, serikali za mitaa na wakazi katika eneo lililoathiriwa na mradi) walishauriwa na maoni yalitafutwa kupitia

mahojiano, mijadala ya vikundi na idadi ya mikutano ya hadhara. Walioshauriwa na Wadau wa Mradi wa SGR Uvinza hadi Kigadye ni pamoja na:

Viongozi wa Serikali ngazi ya Wizara, Mkoa, Wilaya, Kata na Vijiji

- a) Wizara ya Ujenzi na Uchukuzi (MoWT)
- b) Wizara ya Fedha na Mipango (MoFP)
- c) Sekretarieti ya Mkoa wa Kigoma
- d) Halmashauri ya Wilaya ya Uvinza
- e) Halmashauri ya Mji wa Kasulu
- f) Halmashauri ya Wilaya ya Kasulu
- g) Halmashauri ya Wilaya ya Buhigwe
- h) Ofisi za Kata na Vijiji

Katika ngazi ya Wilaya, Viongozi mbalimbali husika walishauriwa wakiwemo

- a) Wakuu wa Wilaya,
- b) Wakurugenzi Watendaji wa Wilaya,
- c) Maafisa Ardhi wa Wilaya,
- d) Maafisa Maliasili wa Wilaya,
- e) Maafisa Ardhi wa Wilaya,
- f) Maafisa Mazingira wa Wilaya, pamoja na ofisi za Mhandisi wa Wilaya na Maafisa Maendeleo ya Jamii wa Wilaya.

Taasisi za Serikali

- Shirika la Reli Tanzania (TRC)
- Ofisi ya Makao Makuu ya TANROADS
- Ofisi ya TANROADS Mkoa wa Kigoma
- Ofisi za Wilaya za TARURA
- Ofisi ya TANESCO Wilaya
- Ofisi za Wilaya za RUWASA
- Wakala wa Huduma za Misituta Tanzania
- Mamlaka ya Bonde la Maji la Ziwa Tanganyika
- Shule ya Misheni ya De Paul
- Shule ya Sekondari Ruchugi
- Shule ya Sekondari Katundu

Asasi za kiraia

- Chama cha Wamiliki wa Nyimbo Tanzania (TATOA)
- Kikundi Cha Maarifa na Taarifa Kasulu (GBV-NGO)
- Endeleva Wazee Kigoma (EWAKI)
- Chuo na Taasisi ya Chemba ya Biashara, Viwanda na Kilimo Tanzania (TCCIA) Canada

Muhtasari wa matokeo

Ushauri wa Wadau wa Mradi wa Uvinza hadi Kigadye SGR unajumuisha makundi matatu ya wadau, ambayo ni pamoja na, kwanza, kitaifa, mikoa, wilaya, kata na vijiji

vilivyoathirika, pili, mashirika ya serikali na tatu, NGOs mbalimbali na CBOs na mashirika ya umma. Mkutano wa kwanza wa Mashauriano ya Wadau ulifanyika kati ya tarehe 31 Mei 2023 hadi 22 Juni 2023 katika maeneo mbalimbali na jumla ya ofisi saba za wizara, mikoa na wilaya zilishauriwa na kupokea maoni, maoni na michango. Kikao cha wadau wa mamlaka za mikoa na wilaya kilifanyika katika ofisi zao. Wakati mradi wa mtaa ulioathiriwa mkutano uliandaliwa katika ngazi ya kijiji kwa msaada na maelekezo kutoka kwa Wakurugenzi Watendaji wa Wilaya ambapo jumla ya uongozi wa vijiji ishirini na mbili (22) walihudhuria. Mkutano wa hadhara wa kijiji ulitoa jukwaa pana kwa washikadau wote husika kueleza matatizo yao, kuangazia mradi unaohusiana na athari za mazingira, kijamii, kiuchumi na hatari na masuala muhimu. Jumla ya watu 1,291 walihudhuria mkutano wa mashauriano, kati yao wanaume walikuwa 887 na 346 walikuwa wanawake.

Masuala na kero zilizotolewa wakati wa mikutano ya wadau

Masuala makuu yaliyoangaziwa wakati wa mkutano yamefupishwa hapa chini:

- Mradi ni muhimu kwa jamii za mahali ambapo reli inapitia, taifa na ushirikiano wa kikanda
- Uongozi unaunga mkono mradi uliopendekezwa
- Fursa za ajira kwa watu walioathiriwa na mradi
- Fidia kwa wakati na haki kwa mali zilizoathirika
- Masuala ya rasilimali za misitu, makazi ya wanyamapori na korido
- Kwamba uteuzi wa jumuiya za mradi ufanywe kwa kushauriana na jumuiya za mradi katika ngazi ya mtaa.
- Epuka makazi mapya bila hiari na kama kuepuka haiwezekani, fidia mali ya kibinafsi iliyoathiriwa na mradi.
- Serikali inapaswa kuwashirikisha wananchi katika kila nyanja ya maendeleo na utekelezaji wa mradi. .
- Upangaji unaopendekezwa unapita katika vijiji ambavyo vina mpango wa matumizi bora ya ardhi. Msanidi programu ana jukumu la kufadhili utayarishaji wa mpango mwingine wa matumizi ya ardhi.

Utaratibu wa malalamiko

Utaratibu wa kutatua malalamiko umetengenezwa kwa ajili ya matumizi yanayoweza kutumiwa na wote wanaopenda

wadau. Lengo la utaratibu wa malalamiko ni kufikia utatuzi uliokubaliwa wa malalamiko yaliyotolewa na wadau hao. Utaratibu huu wa malalamiko unahakikisha kwamba malalamiko na malalamiko yanashughulikiwa kwa nia njema na kwa njia ya uwazi na bila upendeleo, lakini ambayo inakubalika kiutamaduni. Malalamiko yanayotolewa na washikadau yanahitaji kusimamiwa kwa njia ya uwazi, inayokubalika kwa urahisi kwa makundi yote ya jamii zilizoathirika na washikadau wengine, bila gharama yoyote na bila malipo. Utaratibu wa malalamiko unapaswa kuendana na ukubwa wa athari na hatari zinazoletwa na mradi na kuwa na manufaa kwa mtetezi/mwendeshaji na washikadau, hasa PAPs.

Mipango ya taasisi

Shirika la Reli Tanzania (TRC) ndilo PIE kuu yenye jukumu la jumla la kuhakikisha kuwa Mradi unatekelezwa kikamilifu kwa kuzingatia Mahitaji ya Mwajiri (yaani, TRC) pamoja na mahitaji na viwango vya kitaifa na vya Wakopeshaji (yaani, katika Uvinza hii-Kigadye SGR, mkopeshaji ni Benki ya Maendeleo ya Afrika-, AfDB) pamoja na mikataba mingine ya kimataifa inayotumika na viwango vya ujenzi wa reli.

TRC imepewa jukumu la kutekeleza ujenzi na uendeshaji wa reli nchini Tanzania kupitia Sheria ya Reli, 2017 iliyounda TRC na kuongoza uendelezaji, matengenezo na uendelezaji wa miundombinu ya reli, huduma za usafiri wa reli na mambo yanayohusiana nayo. Sheria hii inatoa mamlaka kwa TRC kujenga miundombinu ya reli na miundo mikuu, kupata, kushikilia, na kutenganisha mali zinazohamishika na zisizohamishika na kuendesha mfumo wa reli kwa kuhakikisha kuwa ni salama, imetunzwa na ni endelevu.

Mbadala wa Mradi

Njia mbadala kadhaa zilitathminiwa katika mchakato huu wote wa TAM, njia hizi mbadala hutoa misingi ya kufanya chaguo bora zaidi kwa uendelevu wa njia ya reli na manufaa kwa jamii za kitaifa na za mitaa. Maelezo ya kila mbadala yametolewa katika hati kuu huku sehemu hii ikiyafupisha ikijumuisha mbadala wa "Hakuna mradi".

Mbadala wa "Hakuna Mradi"

Mbadala huu unarejelea chaguo la kutotekeleza mradi wa ujenzi wa reli unaopendekezwa au njia mbadala zake nyinginezo. Kukubali chaguo hili bila shaka kutaepusha athari nyingi mbaya zinazohusiana na mradi lakini pia kutapoteza manufaa mengi. Kupitisha njia hii mbadala kunamaanisha kwamba njia ya reli kutoka Uvinza (Tanzania) hadi Musongati (Burundi) haitajengwa, hivyo kufanya kuwa vigumu au vigumu kunyonya amana za nikeli katika eneo la Musongati, na kushindwa kufungua Burundi isiyo na bandari kwa biashara ya kikanda na kimataifa kupitia bandari ya Dar es Salaam (Tanzania). Muhimu zaidi, chaguo hilo lingemaanisha kuendelea kwa shida za watu na maendeleo duni ya kikanda. Kwa kumalizia, njia mbadala ya 'hakuna mradi' haikubaliki, na mradi wa maendeleo ya reli unaopendekezwa unapaswa kutawala.

Njia Mbadala za Mahali pa Stesheni huko Kasulu

Maeneo ya awali yaliyopendekezwa ya njia ya reli yalikuwa yakiingilia kati njia kuu ya barabara kuu iliyopendekezwa, ambayo ililenga kuepusha msongamano wa magari katikati ya mji wa Kasulu. Halmashauri ya Mji pia inapendekeza kupata stendi kuu ya mabasi kando ya njia hii ya kupita barabara na kwa hivyo mpangilio wa awali wa njia ya reli pia utaathiri stendi kuu ya mabasi iliyopangwa.

Ili kuepusha njia ya reli inayopendekezwa kuingilia kati stendi inayopendekezwa ya mabasi, sasa imeamuliwa kuwa njia ya reli ihamishwe takriban kilomita 2.5 kuelekea mashariki, ili kituo cha reli kiunganishwe na barabara iliyopo ya changarawe ambayo pia ndiyo njia inayopendekezwa ya kuingia. kwa stendi ya basi na kituo cha mji. Kuhusu kituo cha mpakani mwa Tanzania/Burundi timu ya TAM inakatisha tamaa kituo cha pamoja na cha kuingia mtu mmoja mpakani kwa sababu za kisiasa na kiusalama na

inapendekeza vituo viwili tofauti, kimoja kwa upande wa Tanzania na kingine upande wa Burundi.

Mpango wa Usimamizi wa Mazingira na Kijamii

Mpango wa Usimamizi wa Mazingira na Kijamii (ESMP) unaainisha hatua za kupunguza na kuimarisha kushughulikia athari zote mbaya na chanya zilizotabiriwa kulingana na ripoti ya TAM. ESMP inahitaji msanidi programu kutekeleza hatua za kupunguza na kuimarisha athari zilizotabiriwa na kuonyesha uzingatiaji wa viwango vya mazingira vinavyohusika na Tanzania na/au vilivyopitishwa kutoka kwa mashirika ya kimataifa. Gharama ya kupunguza/kuboresha ni takriban USD 1,135,000. Hata hivyo, kuna gharama nyingine ambazo hazijaamuliwa na zinahitaji kuzingatiwa.

Mpango wa ufuatiliaji wa mazingira

Utangulizi

Lengo la msingi la ufuatiliaji wa mazingira ni kuhakikisha kuwa hatua za kupunguza zinatekelezwa na athari hasi zinazoweza kutokea zinapunguzwa, kupunguzwa hadi viwango vinavyokubalika. Lengo kuu la Mpango wa Ufuatiliaji wa SGR wa Uvinza Kigadye ni pamoja na yafuatayo:

- Kutathmini mabadiliko katika hali ya mazingira
- Kutathmini utendakazi na ufanisi wa hatua za kupunguza zilizopitishwa
- Kuamua kufuata mradi na mahitaji ya udhibiti na kuchukua hatua za kurekebisha
- Kutambua mapungufu yanayoweza kutokea na kutekeleza mara moja hatua za kurekebisha

Upeo wa ufuatiliaji

Upeo wa ufuatiliaji wa mradi umegawanyika katika awamu kuu mbili ambazo ni;

1. Ufuatiliaji wa utambuzi wa athari unaojumuisha sampuli za mara kwa mara ili kutathmini athari za ujenzi na uendeshaji wa mradi kwenye mazingira na afya ya binadamu, na kuhakikisha maendeleo kuelekea kupunguza athari mbaya za mradi.

2. Ufuatiliaji wa utiifu unafanywa ili kuhakikisha kuwa shughuli zote za mradi na mradi mdogo zinafuata kikamilifu kanuni na viwango vya Wakala wa Ulinzi wa Mazingira kulingana na viwango vya Kitaifa na mahitaji ya wafadhili katika kesi hii ulinzi wa uendeshaji wa AfDB (OS).

Vigezo vya ufuatiliaji

Vipokezi vinavyohitajika kwa ufuatiliaji ni pamoja na:

- a. Ubora wa Hewa
- b. Rasilimali za Maji
- c. Afya na Usalama Kazini

- d. Kelele na mtetemo Ubora
- e. Ubora wa Udongo
- f. Uzalishaji na Usimamizi wa Taka
- g. Mazingira na Visual
- h. Bioanuwai
- i. Makazi mapya
- j. Urejesho wa riziki

Kuisha kwa mradi

Mradi unaopendekezwa wa njia ya reli unajumuisha shughuli kama vile ujenzi wa kambi ya wafanyakazi, uchimbaji na kutoa vifaa vya ujenzi, ujenzi wa barabara za kuingilia na miundombinu inayohusiana nayo. Kufikia sasa, msanidi wa mradi hajaweka wakati maalum wa kusitisha mradi huo. Kutakuwa na baadhi ya vipengele vya mradi ambavyo vitafungwa punde tu mahitaji yao yatakapokamilika.

Kwa mfano, kufunga kambi ya wafanyakazi wa muda baada ya ujenzi, kufunga maeneo ya machimbo, mashimo ya mashimo pamoja na barabara za kuingia baada ya ujenzi au kazi katika eneo hilo na hatimaye kukatika kwa miundombinu yote ya reli baada ya mwisho wa maisha au mambo mengine yamelazimu hilo kutokea. Athari kadhaa (hasi na chanya) zina uwezekano wa kutokea kama matokeo ya uondoaji. Ripoti ya TAM inajadili athari za kusitisha utekelezaji wa maendeleo yaliyopendekezwa na kupendekeza hatua za kukabiliana na athari.

Gharama zinazohusiana na mradi

Makadirio ya gharama za ujenzi wa mradi wa reli ya Uvinza - Kigadye unaopendekezwa ni takriban dola za Kimarekani bilioni 1.45. Makadirio ya gharama za utekelezaji wa hatua za uboreshaji, hatua za kupunguza na pia mchakato wa ufuatiliaji yaani, mpango wa usimamizi wa mazingira na kijamii na mpango wa ufuatiliaji wa mazingira na kijamii ni USD 2,630,704.61 na USD 2,130,000 mtawalia kama ilivyojadiliwa katika Sura ya 8 na 9 ya ripoti hii. Gharama hizi za makadirio ya hatua za kupunguza au kuimarisha hazijumuishi gharama kamili za mazingira, ambazo hazikuweza kuhesabiwa kwa usahihi. Kwa kuwa baadhi ya athari zitapatikana tu wakati wa awamu ya ujenzi, gharama za hizi pia zitakuwa za muda mfupi, haswa ikiwa hatua za kupunguza zitatekelezwa kikamilifu.

Hitimisho na Mapendekezo

Utekelezaji wa reli iliyopendekezwa na miundomsingi inayohusika inawakilisha maendeleo makubwa ya miundombinu yanayounganisha Burundi (nchi isiyo na ardhi) hadi Tanzania (yenye bandari za Bahari ya Hindi). Mradi huo utakuwa na matokeo chanya kadhaa ikiwa ni pamoja na mchango katika ushirikiano wa kikanda, biashara ya kikanda, na urahisi wa usafirishaji wa mizigo mikubwa kutoka maeneo mbalimbali yanayoweza kuchimba madini nchini Burundi na uwezekano wa kilimo wa magharibi

mwa Tanzania. Taarifa ya TAM pia imetaja athari kadhaa mbaya zinazoweza kutokea kufuatia utekelezaji wa shughuli mbalimbali za mradi. Athari hizo ni pamoja na upotevu wa ardhi na mali nyingine za umma na binafsi. Sambamba na hilo, seti ya hatua za kuimarisha na kupunguza zimependekezwa, zikifuatiwa na usimamizi wa mazingira na kijamii na mipango ya ufuatiliaji.

Gharama za utekelezaji wa mpango wa kupunguza na ufuatiliaji pia zimeandaliwa pamoja na taasisi zinazowajibika na muda wa kutekeleza hatua mbalimbali za kurekebisha. Lengo kuu ni kuongeza manufaa yaliyotarajiwa ambayo mradi unaopendekezwa utazalisha kimazingira, kijamii na kiuchumi. Hata hivyo, ili kufikia manufaa ya maendeleo ya miundombinu ya reli, sekta ya madini, sekta ya maendeleo ya viwanda na kilimo nchini Tanzania, Burundi na nchi nyingine za jirani za Rwanda na DRC Kongo inahitaji kufanya kazi vizuri.

Kwa hiyo TAM inapendekeza kwamba maendeleo yanayopendekezwa yazingatiwe kwa ajili ya maendeleo kwani yanakidhi malengo ya sera husika na yatatoa huduma kwa jamii katika nchi zote mbili na kuchochea sekta nyingine za maendeleo. Hata hivyo, hatua zinazopendekezwa za kupunguza na kuimarisha zinazopendekezwa katika TAM hii lazima zitekelezwe ili kuhakikisha kuwa manufaa ya mradi yanafikiwa au kuboreshwa.

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LIST OF ACRONYMS AND ABBREVIATIONS

AfDB	African Development Bank
AREMA	American Railway Engineering and Maintenance of Way Association
CBA	Cost Benefit Analysis
CBO	Community Based Organization
CFSVA	Comprehensive Food Security & Vulnerability Analysis
CSITR	Central Slave and Ivory Trade Route
CWR	Continuous Welded Rail
DoA	Division of Antiquities
DTM	Demographic Tracking Matrix
EAC	East Africa Community
EIA	Environmental Impact Assessment
EMA	Environmental Management Act.
ESIA	Environmental and Social Impact Assessment
ESIS	Environmental and Social Impact Statement
ESMP	Environmental Social Management Plan
FAO	Food and Agriculture Organization
GDP	Gross Domestic Products
GOB	Government of Burundi
HIV/AIDS	Immunodeficiency Virus/Acquired Immunodeficiency Syndrome
IDPs	Internal Displaced People
IFC	International Finance Corporation
ILFS	The Integrated Labour Force Survey
IOM	International Organization for Migration
LATRA	Land Transport Regulatory Authority

LSA	Later Stone Age
MNRT	Ministry of Natural Resources and Tourism
MSA	Middle Stone Age
NEMC	National Environment Management Council
NGOs	Non-Governmental Organizations
PAPs	Project Affected Persons
RAP	Resettlement Action Plan
RDI	Rural Development Institute
RoW	Right of Way
RPF	Resettlement Policy Framework
SCR	Salt Caravan Route
STP	Shovel Test Pit
TACAIDS	Tanzania Commission for AIDS
TANROADS	Tanzania National Roads Agency
TPA	Tanzania Port Authority
TPHC	Tanzania Population and Housing Census
TPHC	Tanzania Population and Housing Census
TRA	Tanzania Revenue Authority
TRC	Tanzania Railways Corporation”
UNICEF	United Nations Children's Fund
URT	United Republic of Tanzania

CHAPTER ONE:

1 INTRODUCTION

1.1 Background

The Government of the United Republic of Tanzania (GoT) through the Tanzania Railways Corporation (TRC) is continuing with the construction of the electrified Standard Gauge Railway (SGR) across the country. The SGR project is implemented in phases, which are referred to as “Lots”. Lot 1 (Dar es Salaam to Morogoro) and Lot 2 (Morogoro to Makutupora) have a total length of approximately 541 km. The SGR lot 3 (Makutupora to Tabora) has a total length of 294 km and Lot 4 (Tabora to Isaka) has a total length of 130 km. Lot 5 (Mwanza to Isaka) cover approximately 237km of the mainline. Construction for these Lots (i.e., Lot 1 up to Lot 5) is ongoing. The contract for SGR Lot 6, Tabora to Kigoma has been signed and logistics to commence work have started. Preparatory works are underway for the construction of the SGR project from Uvinza to Kigadye covering four districts of Uvinza DC, Kasulu Town Council, Kasulu District and Buhigwe District in the Kigoma region.

he EAC Treaty highlights the need for cooperation in the use of infrastructure and services, in particular in transport and communication, in order to support regional integration and socio-economic development (EAC Treaty, 2010). It also stresses the need for coordinated, harmonized, and complementary transport policies; improvement and expansion of existing links; and establishment of new ones including the Uvinza-Kigadye SGR Line, which eventually will cross to Burundi and Democratic Republic of Congo (DRC) which will enhance physical cohesion of the member countries and facilitate intra-regional commerce and global connectivity (*ibid*). Such cooperation will alleviate constraints and bottlenecks along a value chain, improve connectivity for ease of flow of goods and services, add value to the regional economy and facilitate a competitive regional economy that attracts investment, thus creating economic growth, as well as jobs and subsequently poverty alleviation (*ibid*).

The Uvinza–Kigadye SGR covers approximately 156km. The project will constitute an integral part of a new international trade corridor from the Tanzania central railway line linking Uvinza to the mining area in Musongati, Burundi. The aim is to connect the mining area around Musongati to world trade, via the Dar es Salaam seaport. It will also connect DR Congo through a proposed SGR extension from Gitega to Kindu, DRC. According to a study commissioned by the African Development Bank (AfDB) in 2009, Burundi is among the 10 countries in the world that have important deposits of nickel, cobalt, copper, iron, and platinum group elements, most of it still untapped. The most important deposit is the one at Musongati with estimated 185 million tons of nickel. This mining area needs a reliable freight and passenger transport connection with sufficient capacity to the central railway line in Tanzania. Therefore, the Uvinza to Kigadye SGR and later to Musongati and into DRC is one of the priority projects in Tanzania and Burundi.

The Project will be undertaken as a Design and Build with the Reliability, Availability, Maintainability, and Safety (RAMS) as the basic requirement for Infrastructure and all Systems under this Project allowing for increased design speed of 160 km/h for passenger trains and of 120 km/h for freight trains. Furthermore, Design and construction shall comply with National and International guidelines on Environmental and social safeguards. The works involves the Design and Build of New Railway line consisting of Earthworks, Elevated Structure, Culverts, Tunnels, Viaduct, Permanent way, Stations, buildings and shops, fencing of the line, signalling & telecommunications, IT systems and Electrification Systems of the standard gauge (1,435 mm) railway line from Uvinza to Kigadye 156.4 Km of main line and 85 Km of Sidings/ Passing Loops. This ESIA report covers the part within Tanzania (Uvinza to Kigadye Village in Kasulu District (at the Tanzania- Burundi border) and does not include the Burundi side.

1.2 Project Rationale and Objectives

The main objective of the SGR Project is to provide efficient and sustainable transportation along the central corridor of Tanzania and to revitalize the railway transport sector to contribute to the national and regional economy. At the moment, over 90% of the cargo leaving the port of Dar es Salaam is transported by road to the detriment of the road network thus, resulting in higher maintenance costs and higher rates of greenhouse gas (GHG) emissions. Therefore, the SGR from Dar es Salaam to Mwanza and Kigoma will increase freight and passenger capacity and reduce road transport, thereby releasing pressure on the road network and reducing GHGs. The SGR is also expected to reduce the travel times for both goods and passengers and unlock economic opportunities in remote areas of Tanzania and the central corridor, which has the potential for growing agriculture, mining and livestock sectors as well as increasing intra-trade among the East African countries. The SGR project will contribute to providing the connection of landlocked neighbouring countries of Uganda, Rwanda, Burundi, and the Democratic Republic of Congo (DRC) and providing access to those countries to the ports in Tanzania. The main objectives of the project include to:

- f) develop a reliable, cost-effective, efficient and seamless railway transport system to Burundi and DRC from the coast of the Indian Ocean.
- g) provide efficient and affordable transport services, promote trade, regional economic integration and the development of mining, manufacturing and agri-business within the corridor area.
- h) increase transport safety and protection of the environment.
- i) allow interoperability with new railway lines by modernizing standards, and
- j) increase the railway speeds and haulage capacity more than the existing railway line

The proposed SGR is expected to link with the new SGR line from Tabora to Kigoma in the Uvinza District. ay speeds and haulage capacity more than the existing railway line.

1.3 The Environmental and Social Impact Assessment (ESIA)

According to the Environmental Management Act (EMA) 2004 and the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations

(2018), no development activity shall be allowed to proceed without obtaining an environmental certificate from the Minister responsible for Union and the Environment in the Vice President's Office of United Republic of Tanzania. The application for EIA is provided under Regulation 4 A of the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 where, in consideration of the magnitude of risks impacts on the environment and social, projects are classified into the following categories:

- (i) Type "A" category for mandatory EIA projects;
- (ii) Type: B1" category for borderline projects;
- (iii) Type "B2" category for non-mandatory projects, and
- (iv) Special projects Category (that follow procedures for Type A projects)

The First Schedule of Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 categorizes projects that fall under Transport and Infrastructure development, specifically item 9c dealing with construction and /or expansion of existing railway lines as Type A projects. Type A Projects are regarded as those projects likely to have significant adverse environmental and social risks and impacts and that in-depth study is required to determine the scale, extent and significance of the risks and impacts and to identify appropriate mitigation before the project is allowed to proceed to construction. The SGR for Uvinza – Kigadye falls under item 9c project namely construction of a railway line, thus requiring mandatory EIA.

In addition, the project falls under several international requirements including the African Development Bank, which establishes the importance of (i) integrated assessment to identify the environmental and social impacts, risks, and opportunities of projects; (ii) effective community engagement through disclosure of project-related information and consultation with local communities on matters that directly affect them; and (iii) the client's management of environmental and social performance throughout the life of the project.

1.4 The Need for Environmental and Social Impact Assessment (ESIA)

The purpose of this ESIA is to ensure that the potential risks and impacts associated with the Project are foreseen and addressed early during the project's planning and design stage. The assessment's findings at different stages will be communicated to the feasibility and designing team to ensure their consideration into the designing process. It is expected that such planning and design arrangement will shape the project so that its benefits can be achieved and sustained without causing inadvertent problems.

This ESIA was conducted as a requirement of the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations, 2018 and was done according to the Terms of Reference (ToR) approved by NEMC prepared during the scoping study and has accommodated requirements of the AfDB.

The ESIA identified and predicted potential consequences or impacts of the Project relating to physical, biological, social, health and economic environment to the immediate community and the larger population in general. It examined how the Project might cause harm to people, their properties and livelihoods and pay attention to potential

benefits to be accrued from the Project that will increase opportunities for environmental conservation, economic growth, employment and poverty reduction so as to achieve sustainable development.

After predicting the potential problems and opportunities, the ESIA identified measures to minimise the problems and enhance the opportunities and outline ways to improve the Project sustainability

1.5 Scope of the Study

The main scope of this study was to examine social and environmental risks and impacts associated with the construction of the SGR that covers an estimated total of 156 KM of the main line and 74km siding and 85 Km of Sidings/ Passing Loops with a width of 60m. The scope also covered an assessment of impacts and risks arising from the construction of workers' camps, opening and operating borrow pits, rock quarries, water sources, access roads etc. In its undertaking, this study included among others the following:

- To ensure that environmental considerations are explicitly addressed and incorporated into the decision-making process, with the aim to anticipate and avoid, minimize, or offset the adverse significant biophysical and social effects of the proposed project; and to protect the capacity of natural systems and ecological processes to maintain their functions.
- To promote development that is sustainable and optimizes resources use and management opportunities

1.6 Study Approach

The approach to this exercise was structured to cover the requirements under the Environmental Management Act (EMA 2004) and its regulations and other relevant national policies and laws as well as adherence to AfDB requirements. Broadly it involved an understanding of the project background, preliminary route selection, project phases as well as the baseline conditions which the project was to take place.

Baseline information was obtained through physical field studies and investigations in the project site including collecting samples of various biological and ecological species, field data collection involving socio-economic, air quality noise and vibrations, desktop studies, and public consultations and engagement with members of the community living in the project areas. Additional approaches and techniques included, surveys, photography, and discussions with the project Proponent. The collected data were analysed and interpreted in relation to key issues relevant to national policies, laws and international standards and principles.

1.7 Study Methodology

The methodology used in this study follows procedures set out in the Environmental Management Act (EMA 2004) (URT, 2004) and Environmental, Health, and Safety Guidelines for Railways, 2007. The process for conducting this ESIA is closely related to the flowchart presented below.

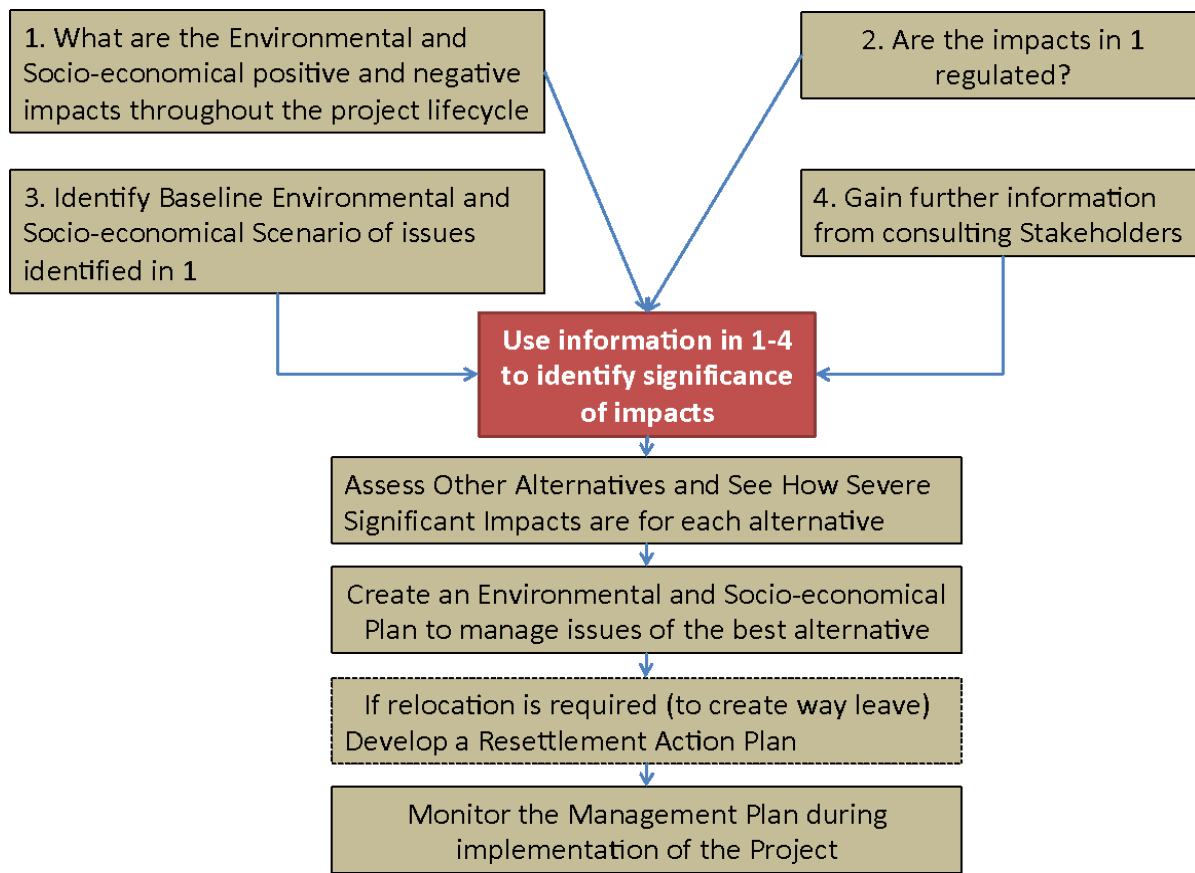


Figure 1-1: Overview of the Impact Assessment Process

1.8 Issues Associated with the Proposed Project

Kay issues associated with the proposed project activities for environment and human receptors were identified based on the existing environmental setup and standard project activities relevant to SGR construction and as explained in the project description detailed in Chapter 2.

1.9 The Baseline Situation

Establishing the baseline condition - the status quo is critical for the purposed of determining possible changes. The baseline condition is provided in Chapter 4 so as in to measure the extent of the risks and impacts the project might have on various receptors. The assessments and analysis of the current level of impacts arising from the project implementation involved specialized study on flora and fauna, air, noise vibration, soil, hydrology and water. It also covered socioeconomic issues, cultural and archaeological aspects that the project might trigger. The aim of ascertaining the baseline condition was to appreciate the extent the proposed project can alleviate or exacerbate the current situation.

A variety of tools including questionnaires, site visits, record reviews were used to gather most of the secondary information that form part of the baseline condition.

In this study, the tools used for impact prediction were simple technique such as analogy, checklists, and matrices, and indices. Apart from these prediction methods, the most obvious and useful means of prediction was simply to draw upon expert knowledge, experience, and judgment. Several SGR and other linear projects have been undertaken and these provided sufficient information upon which, the proposed development can also be judged.

Having predicted the impacts, they were assessed for their relative significance, employing the following criteria:

- Magnitude and likelihood of the impact and its spatial and temporal extent.
- Likely degree of recovery of the affected environment.
- Value of the affected environment.
- Level of public concern; and
- Political repercussions.

An impact that reflects any of the above or most of them was considered significant, warranting further attention. Other methods of evaluating significance involved comparison of expected impact levels with existing standards, which provide guidance on the minimum acceptable levels to which the proposed project should adhere. Together with these methods, each potential impact was rated and a matrix that compares a range of project options was produced

1.10 Stakeholders Engagement

A Stakeholder Engagement Plan (SEP) was prepared and guided the process of consultation and engagement with project stakeholders. The SEP identified key stakeholders, analyzed their stake with regard to the project, included a plan on how to engage with them and information on Grievance Redress Mechanism. Several stakeholders were consulted to identify their concerns, views, possible risks and impacts and mitigation options to various project activities. These consultations and the issues raised have been adopted in informing the various conclusions and suggestions made in this report. This report includes the following information

1.11 Assessment of Positive and Negative Impacts

Impact identification and prediction were key processes that enabled a process to estimate the magnitude, extent and duration of the potential impacts. Impact magnitude relate to the severity of the impact, whether the impact is reversible or irreversible, and the potential rate of recovery from the impact. The extent of the impact related to the zone of influence of the impact, which could be site-specific, limited to the project area, regional, national or even international. Impact duration relate to temporal dimensions:

those lasting for only 3 years after project initiation were classified as short-term; those continuing for 10 years or more but less than 20 years were considered medium-term; while those lasting beyond 20 years were considered long-term.

This exercise also reviewed and analysed interaction between the proposed project and the existing environment. Distinction is made between significant positive and negative impacts, direct and indirect impacts, and immediate and long-term impacts. Impacts, which are unavoidable or irreversible, and cumulative impacts. Wherever possible and applicable, impacts are described quantitatively in terms of environmental costs and benefits.

1.12 Consideration of Alternatives

An analysis of alternatives to meet the ultimate project objective was carried out from scoping and has been further undertaken in this report. This analysis included alternatives that were examined while developing the proposed project, The alternatives considered were those that from an environmental, socio-cultural, or economic point of view may be more viable than the proposed alternatives.

The analysis included the examination of the 'no project' alternative, which assesses environmental conditions without the project. It is described how the alternatives compared in terms of potential impacts, costs, suitability under local conditions, as well as institutional, training, and monitoring requirements. Other alternatives considered include location and alignment alternatives.

1.13 Developing an Environmental Management Plan

It is important to ensure that the true costs of the project are accounted for in the financial and economic model of the project. Such costs are often borne by the surrounding local people rather than the proponent. In this ESIA the environmental costs associated with the proposed development have been internalized through advocating for "good designing process" and impact mitigation plan. The mitigation measures relate to:

- Measures to avoid an impact where possible.
- Estimating the impacts and costs of those measures, and of the institutional and training requirements to implement them.
- Reducing or minimizing the impact magnitude, extent, or duration.
- Preparing a management plan including proposed work programs, budget estimates, schedules, staffing and training requirements, and other necessary support services to implement the mitigating measures.
- Compensating for the damage caused
- A management plan also covering the decommissioning phase of the project.

The issue of compensation, especially for lost properties and assets, has been addressed through the RAP, which has been treated separately from this ESIA.

Subsequently, the mitigation and enhancement measures for significant impacts are provided in a tabular form.

Thus, each activity is designed to eliminate, offset, or reduce environmental impacts to acceptable levels. Effective mitigation of potential impacts requires institutions and administrative management systems to be put in place. Thus, the impact mitigation plan provides a framework for managing or mitigating environmental impacts for the life of the project. This requires funding, and this has been estimated as much as possible and included in the ESMP as part of the overall project cost.

1.14 Developing an Environmental Monitoring Plan

Mitigation measures will be of little or no value if not implemented, hence the link between mitigation and monitoring of outcomes through Environmental Management Plan (ESMP). Monitoring will involve systematic collection of data through a series of repetitive measurements and activities during the life of the project to provide information on characteristics and functioning of environmental and social variables. In this ESIA, indicators for monitoring data collection, frequency and methods of collection are provided as part of the Monitoring Plan.

The plan includes cost estimate and responsibilities for carrying out the proposed monitoring plan. Monitoring is critical as it save the function of knowing whether the mitigation measures are effective, lessons learned from monitoring, provides data for management decisions and creates a databased for future projects. Therefore, monitoring must be as scheduled and done properly and report to inform management decision provided on time.

1.15 Structure of the Report

The report is structured to closely follow Section 18 of the Environmental Impact Assessment and Audit Regulation of 2005 amended in 2018. Details of the content of the report are in Table 1-1.

Table 1-1: Structure of EIA Report

Chapter	Description
Executive Summary	Provides a short summary of each chapter in the EIA report
Acknowledgement	Express the appreciations and gratitude of the proponent in completion of the study
Abbreviations and acronyms	Provides the list of word used in the EIA Report in short term
Chapter 1	Introduction

Chapter	Description
	Provides a background to the proposed project, summarizing the rationale of the project
Chapter 2	Project Background and Description Describes the proposed project and its nature, together with the planning, design, and activities of the project
Chapter 3	Legislation and Policies. Describes the legal and regulatory framework for the ESIA, including relevant international conventions and policies. Describes the authorized bodies that will be involved in the ESIA process
Chapter 4	Baseline Environment and Social Conditions Describes the existing physical, biological and socio-economic environment that could be affected by the project.
Chapter 5	Stakeholder Identification and Participation This chapter describes the how the people who affected by the project either positively or negatively were involved in the project
Chapter 6	Impact Identification, Assessment and Evaluation This chapter describe on how impacts identified and how will be characterized to be compatible to the environment
Chapter 7	Analysis of Project Alternatives This chapter provides the opportunity for an unbiased, proactive consideration of options, to determine the most optimal course of action. The selection of alternatives is a crucial undertaking in conducting ESIA.
Chapter 8	Mitigation Measures This chapter provides details regarding mitigation measures to be undertaken
Chapter 9	Environmental and Social Management Plan. This chapter describes the systematic plan on how to implement the measures provided in chapter six and responsible personnel and cost of implementation
Chapter 10	Environmental and Social Monitoring Plan. In this chapter describes on how to control the parameters of elements which seems to be more averse to both environment and community

Chapter	Description
Chapter 11	Cost Benefit Analysis. This chapter provides compilation of a comprehensive list of all direct and indirect costs, intangible costs, opportunity costs and the cost of potential risks and direct and indirect revenues and intangible benefits, such as increased production from improved employee safety and morale, or increased sales from customer goodwill associated with the project or decision
Chapter 12	Capacity Building Requirement for TRC to implement ESMP This chapter provides information regarding capacity development for TRC to oversee the project and implement the ESMP
Chapter 13	Summary and Recommendation Provides the outcomes or results of the proposed project and final judgment and decision
Chapter 14	References Provide a list of cited materials
Chapter 15	Annexes Provides a list of evidence about the ESIA process and the Proponent

1.16 Public Disclosure of Draft ESIA

Information relevant to the project was disclosed at different stages of the ESIA process and was part of the Stakeholder Engagement Plan. Disclosed information included the purpose, nature, and scale of the project; the duration of the various project activities, risks and impacts arising from the project and mitigation measures including issues related to compensation and the rights of the affected persons to various remedies as provided by laws of Tanzania. Also, disclosure involves sharing information with stakeholders regarding a grievance redress mechanism that stakeholder can use throughout the ESIA process. Stakeholders were informed about ways they can use to communicate with TRC and submit their grievances. The following channels have been established for registering a grievance:

- *Written communication* via Project Grievance Forms
- *Verbal communication* in-person or via telephone to village representatives or TRC

- *Via toll-free Project hotline* (0800-110-042) monitored by two designated TRC personnel.

The ESIA report will also be shared through open public domains such as TRC website, regional and district offices to enhance disclosure and sharing of information.

CHAPTER TWO

2 PROJECT DESCRIPTION

2.1 Project Location and Area of Influence

The Uvinza – Kigadye SGR will traverse from Uvinza District through Kasulu and Buhigwe District in Kigoma Region across the Malagarasi River in Kigadye village into Burundi. The proposed railway line is expected to link with the Tabora-Kigoma SGR line, now under construction, and the SGR Dar es Salaam to Mwanza railway line via Isaka. Map 2-1 shows the Project area and its geographical and administrative features. Table 2-1 shows districts, wards and villages where the Uvinza-Kigadye SGR will traverse.

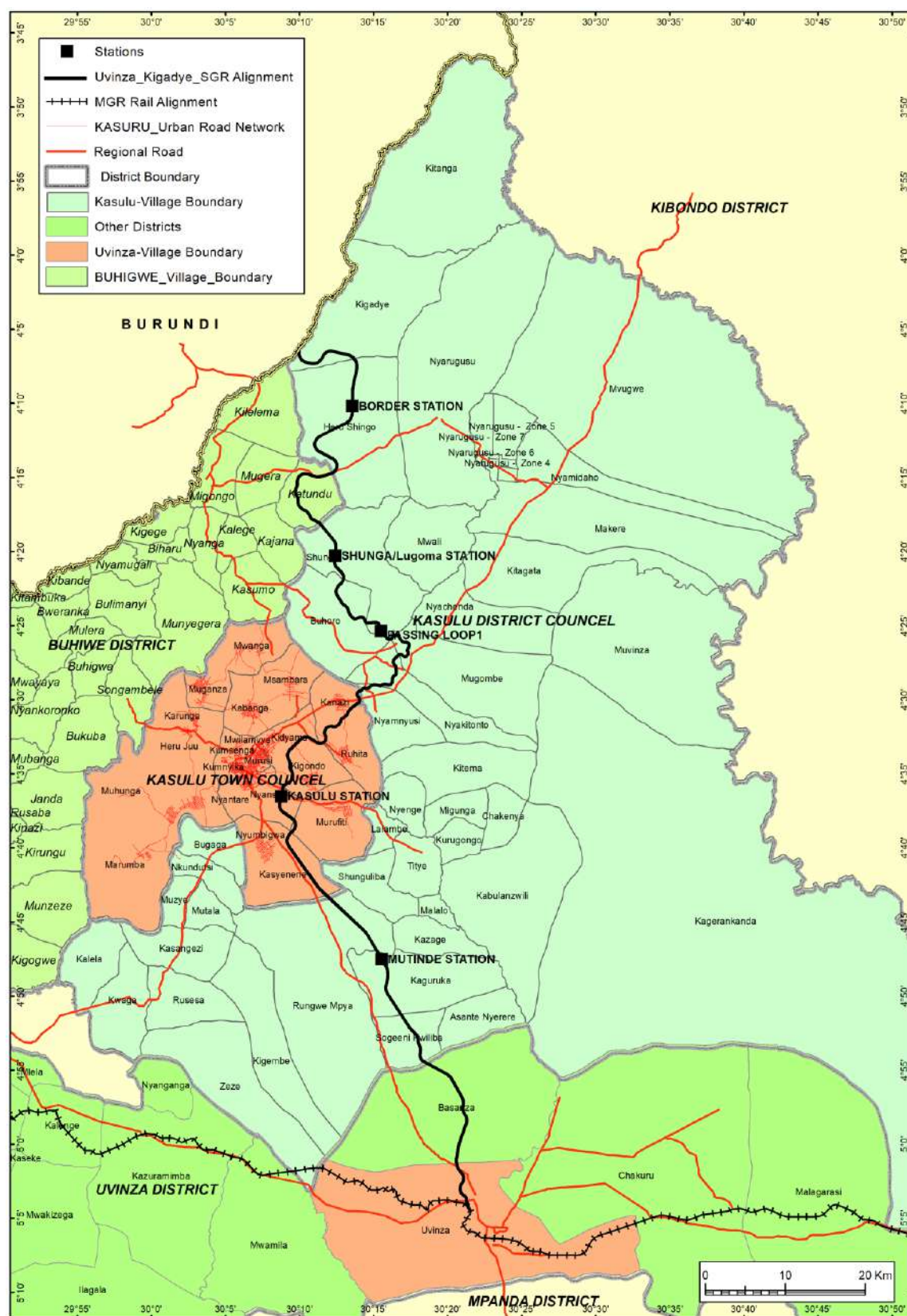
Table 2-1: Districts, Wards and Villages traversed by SGR from Uvinza to Kigadye

S/n	Region	Districts	Wards	Villages
1	Kigoma	Uvinza	Uvinza	Ruchugi
2	Kigoma	Uvinza	Uvinza	Chakuru
3	Kigoma	Uvinza	Basanza	Basanza
4	Kigoma	Uvinza	Basanza	Msebehi
5	Kigoma	Kasulu	Asante Nyerere	Sogeeni Kwiliba
6	Kigoma	Kasulu	Rungwe Mpya	Kaguruka
7	Kigoma	Kasulu	Rungwe Mpya	Rungwe Mpya
8	Kigoma	Kasulu Town	Nyumbigwa	Mwenda
9	Kigoma	Kasulu Town	Muruti	Murufiti
10	Kigoma	Kasulu Town	Nyansha	Nyansha
11	Kigoma	Kasulu Town	Nyansha	Kumbanga
12	Kigoma	Kasulu Town	Kumhama	Kumhama
13	Kigoma	Kasulu Town	Kigondo	Kidyama
14	Kigoma	Kasulu Town	Ruhita	Ruhita
15	Kigoma	Kasulu Town	Ruhita	Kanazi (Tabirugu, Luzilampene, Nyakabondo, Migogwe, Nyangive)
16	Kigoma	Kasulu	Nyamnyusi	Nyamnyusi
17	Kigoma	Kasulu	Nyakitonto	Nyakitonto
18	Kigoma	Kasulu	Nyakitonto	Katonga

19	Kigoma	Kasulu	Nyakitonto	Katonga
20	Kigoma	Kasulu	Buhoro	Buhoro
21	Kigoma	Kasulu	Buhoro	Nyamsanze
22	Kigoma	Kasulu	Buhoro	Lugoma
23	Kigoma	Buhigwe	Mugera	Katundu
24	Kigoma	Kasulu	Heru-Ushingo	Heru-Ushingo
25	Kigoma	Kasulu	Heru- Ushingo	Kigadye

Source: Field Data June 2023

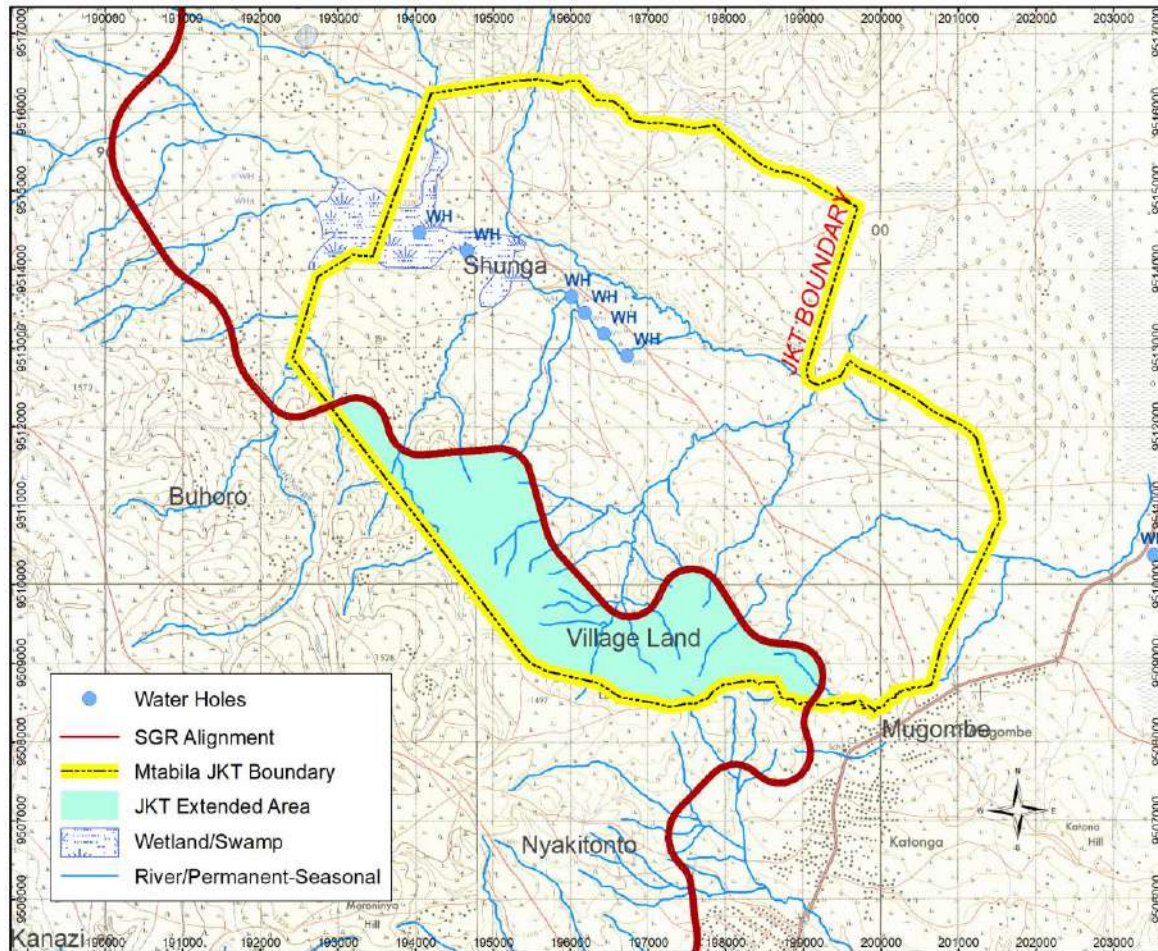
Detailed information on the socio-economic characteristics of the districts and villages/communities through which the project passes is presented in Chapter 4 of this report. The project's Area of Influence (Aol) is defined as the extent of the risks and impacts on the environmental and social receptors and associated components beyond the core project area (i.e., 60m wayleave). In this ESIA, the Aol is defined through a spatial characterization of the local area from 0 km at the central line to 5km or beyond, depending on activities happening in each area. Thus, the Aol may include subregion areas depending on the Project activities and their implications on environmental and social parameters. Areas where construction materials will be extracted from even if they are beyond 5km from the central line, will be included as project Aol because of the potential risks and impacts that might occur as a result of getting and transporting such construction materials.



2.2 Route Description

Unlike other SGR lots (1-6) currently under construction in Tanzania where their alignment runs almost parallel to the existing Meter Gauge Railway (MGR), the Uvinza - Kigadye SGR will be built on completely new areas, thus touching sensitive receptors such as community lands, forest reserves, wetlands, water sources and social services public institutions and economic infrastructure such as roads both in rural and urban areas, and leading to further opening of the vast lands in the western side of Tanzania.

In Kasulu District Council, the proposed SGR for Uvinza - Kigadye route traverses a sensitive area close to Nyakitonto village in Nyakitonto ward, following the government decision to extend the boundaries of the previous refugee camp that has since been converted to a sensitive installation. The government has already carried out valuation of the affected properties and people in that area and compensation will be paid from the 2022/23 national budget so as to allow activities in this area to proceed. In view of this, and given the sensitivity of this area, it will be important to reconsider -realignment of the route going more than 400m south-west from the current extended boundary so as to avoid this sensitive area. Map 2-2 shows that said area relative to the current SGR alignment and the extended boundary.



Map 2-2: SGR crossing a sensitive installation at Nyakitonto Village.

The route in which the SGR Project traverses range from areas with high rainfall to arid and semi-arid areas. The topography of the project railway alignment is characterized by undulating to nearly flatland, rolling, to rolling terrain which are dissected by both perennial and seasonal rivers. In Uvinza, the railway line will traverse through areas which are relatively flat up to Kasulu, and then from Kasulu, the railway project is expected to meander and ascend gradually through a series of hilly areas up to the Heru Ushingo area. The project then traverses through the lowland area of the Malagarasi River and floodplain before running through extensive lowlands of sugar cane plantations.

The major drainage system includes Malagarasi, Mutsindozi and Muyowosi Rivers. However, there are several smaller but significant drainage systems, which cross the railway line and therefore require bridges. These variations produce different types of vegetation such as natural miombo woodland in Uvinza, Basanza, Nyansha and extensive farmlands in Nyansha-Kasulu-Mtabila, From Mtabila to Shunga and Buhigwe (Kitundu), shrubs to wood grassland to grassland and woodlots of *Eucalyptus ssp* and *Pynus patula* characterize the SGR corridor.

2.3 Project Activities

The implementation of the Uvinza -Kigadye SGR will be conducted in phases as follows:

- Design and mobilization Phase.
- Construction Phase.
- Operational Phase.
- Project decommissioning phase

Each of these phases will have different activities taking place sequentially or in combination and the sequence of implementation will depend on the schedule and designing aspects that both TRC as the client and the contractor will agree. This ESIA covers all phases of the project because each phase has different risks and impacts to the receiving environment.

2.3.1 Design and Mobilization Phase

Detailed designing phase has not started for the whole project because TRC has not procured a contractor for the works however, designing shall be influenced by several factors including what is regarded as “Employers Requirement” a document that TRC will prepare detailing what is required and expected from the contractors and sub-contractors. This document details all specification and works that have to be undertaken including consideration of the environmental implication of every activity. The designing will also be influenced by factors such as the results of this ESIA, specifically mitigation measures and what/where should be avoided if possible.

Currently, and drawing from other SGRs in Tanzania, the Uvinza -Kigadye SGR will have a 35t axle load, a design speed of 160 km/h for passenger trains and 120 km/h for freight trains, and a rail width of 1,435 mm (4ft 8 1/2 in). The rail will be 60 UIC, with a maximum train length of 2000 m. It is still not clear as to capacity of passengers and tonnage that could be transported by the Uvinza- Kigadye SGR as these are details that will be incorporated during detailed designing.

The Uvinza-Kigadye SGR will be designed to meet TRC's and reflect the following general requirements:

- Railway Alignment, Hydraulics, Railway Bridges: AREMA, base of the rail shall be true and flat, but a slight concavity not exceeding 0.4 mm can be allowed +/- 10.0 mm
- Overpasses and underpasses, Roadway Bridges and Buildings: Eurocode.
- Roadway Design: Tanzania Road Geometric Design Manual; and
- General Building Specifications: Standard Specifications for Roadworks, 2000.

When designing the Uvinza-Kigadye SGR Project focus shall be on meeting the following specific elements with detailed technical specification indicated in Table 2-2:

- (i) All alignment design elements will be reviewed and optimized during detail design, using Lidar survey, geotechnical and hydrological inputs.
- (ii) Alignment design should be in accordance with AREMA.
- (iii) All structural elements will be reviewed and optimized during detail design, using Lidar survey, geotechnical and hydrological inputs.
- (iv) Viaducts should be specified in major cities to avoid communities' separation.
- (v) All Road Crossings specified in the Employer's Requirements (i.e., TRC) are a minimum, thus assessment shall be done to determine actual needs.
- (vi) All road crossings dimensions shall be designed to cater for Road Class DC2 as a Minimum. Road Classification is given in the Tanzania Ministry of Works Road Geometric Design Manual (RGDM).
- (vii) All Trunk roads crossings dimensions shall be designed to cater for Road Class DC1 as given in the RGDM.
- (viii) All roads over rail crossings shall be provided with a wide enough opening to also allow passage and construction of service road.
- (ix) Inlets and outlet structures of all Pedestrian Crossings and Box Culverts larger than 1.5m x 1.5m should be designed and constructed to also serve as animal crossings and passage of carts.
- (x) Scour protection works for bridges shall be provided.
- (xi) Box Culverts of lengths from 15m to 20m shall have minimum internal opening Dimensions of 1.5m x 1.5m
- (xii) Box Culverts longer than 20m shall have minimum internal opening Dimensions of 2m x 2m.
- (xiii) Side ditches shall have minimum widths of 750mm.
- (xiv) All retaining structures shall be made up of reinforced concrete. Such structures shall include Bridges, Box Culverts, road crossings, retain walls, etc.
- (xv) An operations analysis using dynamic simulation software to model train movements along the main line and to be used to determine optimized location of passing loops.
- (xvi) All working drawings and designs required for the Construction in accordance with the applicable standards and codes of procedure as set out in this Contract.
- (xvii) Project specifications and other provisions required to give effect to the Construction.
- (xviii) Design changes to the drawings, to comply with the Engineering Requirements or as agreed by the TRC's Representative.
- (xix) Design drawing(s) for elevated structure, tunnels, cut and cover and culverts consisting of a general arrangement drawing or drawings as provided for by acceptable international standards.

- (xx) Typing, printing, duplication and binding of documents, reduction of plans and the making of all plan reproductions.
- (xxi) Investigation as to the availability of construction materials and the testing of such materials obtained from the various sources.
- (xxii) Centreline soil surveys are to be done for the Works according to the Specification to be provided by TRC.
- (xxiii) The Contractor is required to provide service manuals for all works.
- (xxiv) The use of BIM should be specified. Building Information Modelling (BIM) is an intelligent model-based process that gives architecture, engineering, and construction (AEC) professionals the insight and tools to plan more efficiently, design, construct, and manage structures and progress.
- (xxv) The box bridges (which is culvert type), the type of structures is counted as bridges, but the actual structure type should be based on transportation survey details with required classification of structures.
- (xxvi) The Contractor is required to provide the Engineer with a fully paid license copy of analysis/design software used in the design.

Table 2-2: Technical Specification of the SGR Uvinza-Kigadye

Parameter	Design
Design speed	160 km/h
Max speed (Passenger trains)	160 km/h
Max speed (Freight trains)	120 km/h
Maximum axle load	35 t
Rail	60 UIC (all trackwork)
Rail cross inclination - On track	1: 20
Rail cross inclination - On turnouts	1: ∞
Gauge of track	1,435 mm
Sleepers	Pre-stressed Mono-block concrete (≈ 380 kg)
Sleeper length	≈ 2.60 m
Sleeper spacing	600 mm / 1,667 sleepers/km
Sleepers for turnouts	Pre-stressed Mono-block concrete
Ballast thickness	300 mm minimum
Ballast shoulder width	400 mm minimum

Parameter	Design
Slope of ballast shoulder	1:1.5
Ballast volume	2.50 m ³ /m
Ballast size	Graded 25mm to 63 mm
Rail fastening system	Elastic rail fastening - anti-vandal
Track	Continuously welded rails (CWR)
Welding procedure	Flash-butt
Main line turnouts	1:24 60 UIC tangential
siding turnouts	1:12 60 UIC tangential
Width platform (top of formation width)	≈ 7.10 m
Inclination platform (formation cross slope)	1: 20
A minimum horizontal curve radius	1900 m
A maximum vertical grade of	1.6%
A maximum actual track cant value (E _a)	120 mm
A maximum cant deficiency (E _u)	75 mm
Fencing of railway corridor	Fencing of railway corridor shall be installed in both sides in urban and rural area.
Tamping method	Mechanized for the whole track including turnouts
Road, rail crossings	Grade separation
Expansion Joint	
Gradient of Station	0 ‰ or 2 ‰ (under approval Engineer)

Source: TRC Employer's Requirement, 2022

The works will also include design elements such as the main line, siding and crossing loops, passenger stations, freight loading and offloading facilities, and the marshalling yard and/or workshop as part of the camp sites. Following completion of the feasibility study phase, detailed design shall be completed for all parts of the work for which TRC's consent has been received. The design will also have the following functional specifications, as shown in Table 2-3.

Table 2-3. Functional requirement for railway design

Parameter	Design
Railway type	Singletrack
Traction type	<p>Electrification</p> <ul style="list-style-type: none"> • Catenary Nominal Voltage: 25KV AC • Traction Power Supply System: 2x25KV • SCADA System
Passing loops	Must accommodate 2,000 m long train. Passing loop consists of a single siding line with a maintenance spur (400 m) to store not-to-go wagons and maintenance machines.
Passenger stations sidings	Must accommodate 400 m long train. Passenger siding consists of a single siding line only.
Freight loading/off-loading facility	Must accommodate 2,000 m long train. Freight facility consists of one marshalling line, two loading lines and a not-to-go spur (400 m)
Marshalling yard and/or Workshop	<p>Marshalling and rolling stock maintenance facility shall be designed with considering future expansion.</p> <p>The contractor shall provide enough facilities to fully accommodate TRC's train operation plan including:</p> <ul style="list-style-type: none"> • Arrival lines for 2,000m long trains. • Departure lines for 2,000 m long trains. • Run-around line for arrivals and departure lines • Classification lines for 500 m long trains • Run-around line for classification 2000m. • Draw-out line for 1,000m for shunting • Wagon and Coach workshop lines • Locomotive workshop lines • EMU (Electric Multiple Unit) workshop lines (optional – to be paid from Provisional sums if instructed) • Paint shop line (optional – to be paid from Provisional sums if instructed) • Electrified test line of 1,000m (with fence). Test related equipment such as signal ATO/ATP,

Parameter	Design
	<p>Balise shall be implemented for a proper test. (Optional – to be paid from Provisional sums if instructed)</p> <ul style="list-style-type: none"> • Not-to-go spur lines of 400 m each. • Shunter lines of 80 m each • Sanding and refuelling line. • Wash bay line • UFL line • Connecting lines and turnouts.

Source: TRC, Employer's Requirement, 2022

The project activities during mobilization phase would include mobilization of resources and purchase of the various equipment, machines, and facilities to be used for the railway project.

Other activities will include recruitment of the workforce, construction of workers' camps, clearance of right-of-way (RoW) that would entail construction of access roads to the RoW, removal of vegetation and existing infrastructure along the proposed corridor (after acquisition and compensation), purchase and transportation of construction equipment (machines, vehicles) and materials (e.g., stones, aggregates, sand, cement etc. and establishment of miscellaneous infrastructure (e.g. water supply systems, access/feeder roads etc.). Some of the machines, equipment and infrastructure materials will be locally available, while others will be imported from outside Tanzania. The project will subsequently employ 576 staff using formula of local content 30:70 for experts and 90% of unskilled labour from Tanzania whilst giving priority to communities along the Project areas. Clearance of RoW would use both human labour and heavy machines such as bulldozers.

Furthermore, land acquisition and compensation for the identified Project Affected People (PAPs) will be conducted in areas within the alignment that would be used for camp sites, project offices, RoW, borrow pits and dumpsites and other facilities as per the design and construction schedule. Compensation of affected persons must be done prior to entry to the sites for any activity and a system of Grievance Redress Mechanism must be in place starting from this early project stage so as to enable affected person lodge their grievances to TRC and contractor for redress.

2.3.2 Construction Phase

This phase will entail construction of railway line from Uvinza to Kigadye entailing construction of all key infrastructure for the project. This would involve civil works and

use of industrial and non-industrial construction materials, laying of platforms, sleepers, and tracks where mostly 576 labour force would be employed (Table 2-4). Also, trucks, water bowzers, concrete mixers and others would be used. Building the embankment would go hand in hand with construction of bridges and culverts and would involve the use of bulldozers, concrete mixers, cement, gravel, and water.

The recruitment modality will be guided by using formula of local content 30:70 for experts and 90% of unskilled labour from respective countries giving priority to communities along the Project areas.

Table 2-4: Estimated Required Labour During Construction Phase

Staff category	Number of labourers
Truck operators	50
Equipment operators	72
Support staff	132
Main Foreman	4
Sub foreman	6
Surveyors	4
Management and Engineering	12
Construction Supervision	04
Sub-total	284
Structures and Station Buildings	
Truck operators	16
Equipment operators	22
Support staff	110
Main Foreman	04
Sub foreman	08
Surveyors	04
Management and Engineering	12
Construction Supervision	04
Sub-total	180

Track Laying and Railway Support Infrastructures	
Truck operators	12
Equipment operators	12
Support staff	66
Main Foreman	04
Sub foreman	06
Surveyors	04
Management and Engineering	04
Construction Supervision	04
Sub-total	112
Grand total	576

Source: TRC feasibility study, 2016

Expected Waste Sources and Types

According to the IFCs Environmental, Health and Safety (EHS) guidelines on waste management, waste is any solid, liquid, or contained gaseous material that is being discarded by disposal, recycling, burning or incineration. Currently, there are no designated public solid waste management systems in all project areas from Uvinza to Kigadye. District authorities in all the areas within the project site have no pressure to set up proper solid waste management system because, according to them, to a large extent, most of the waste is biodegradable although there is an increase in the generation of plastic waste and some hazardous waste such as metals. The SGR Project in these districts will inevitably trigger an increase in the generation of waste and as such, new facilities will have to be provided through the Project for solid waste management. In towns such as Kasulu, waste is dumped at a dump place regarded as a landfill thus, causing more environmental and social concerns to surrounding communities.

The construction of SGR Uvinza-Kigadye project will result in generation of various waste types which have been grouped into construction related and non-construction related wastes. Construction related wastes are those generated directly from construction activities, while the later are those generated by associated activities (i.e., domestic activities at the campsites/worksites). Construction wastes: include both solid and liquid wastes and can be hazardous and non-hazardous materials. Construction waste is grouped based on three project implementation phases as given in Table 2-5:

Table 2-5: Expected waste sources by project phases

Project phase	Activity/source
Preconstruction	Preparation of construction materials, extraction of building materials
Construction	Site clearing (including demolition works), excavations, civil works, finishing works, installations, welding, filling and cutting, vehicle maintenance, office works etc. Note: Construction, operation and decommissioning of campsites and quarry sites is also included in the project Construction phase.
Operation	Operation of railways stations/office work, and stuff vending activities.

Table 2-6: Expected waste generation by type- Uvinza- Kigadye SGR Project

SN	Waste type	Location & Source	Associated activity	Composition
1.0	Liquid waste			
1.1	Sludge (Grey-water)	Camp site: Operation kitchens, cafeteria and laundry facilities	Food preparation Washing & cleaning	✓ Organic Contain chemicals from detergents used, oil and grease. has high BOD, COD, ammonia nitrogen
1.2	Sewage (black-water)	Campsite and work stations: Effluents from toilets and bathrooms	Operation of sanitation facilities, mainly toilets	✓ Organic High organic load contains chemical detergents and pathogens
1.3	Spent water	Garage & car wash bay: effluents from car and accessory washing activities	Washing of construction equipment and machines/ cleaning workshops	Contains waxes, solids hydrocarbons and detergents
1.4	Residual water	Material processing area (Waste water from the batch plants)	Washing/flushing of equipment i.e., concrete mixer trucks) after application and before each new load	Highly alkaline Contains cement residue
2.0	Solid waste			
2.1	Food wastes	Cafeteria, kitchen and dining areas at campsite/ Construction sites	Food preparation, food serving & food storage	Organic and highly putrescible
2.2	Mixed (Office waste)	Typical office activities (papers, broken furniture, packaging materials)	Trash (paper, bottles, broken office furniture etc)	Organic and inorganic

SN	Waste type	Location & Source	Associated activity	Composition
2.3	Yard waste	Campsite	Yard sweepings	Organic
2.4	Litter	Campsite & Construction sites along the SGR line	paper, plastic bottles, plastic bags, glass bottles, wraps etc)	Organic and inorganic
2.5	Mixed (plastic/tin /glass)	Workshops and Construction sites	Cut pipes, damaged materials, plastic chips, clips etc	Inorganic
		Campsite, Construction sites, dispensary	Damaged and unwanted packaging materials containers (including cement bags), containers/drums	Organic and inorganic
		Vehicle maintenance garage	Old/damaged tire, metal parts, car furniture etc	Inorganic
2.6	Contaminated soils	Soils spoiled by spills and effluents from garage, car wash, batch plant, material processing sites, work stations.	Equipment and materials processing, re-fuelling, material processing	Inorganic (hydrocarbons)
2.7	Overburden soils	Construction sites (during site clearing)	Site clearance and levelling	Organic (soils)
2.8	Biomass	Construction sites (during site clearing)	Cut/removed /uprooted vegetation)	Organic
2.9	Construction & Demolition wastes (C&D)	Actual construction works & demolition of unwanted physical structure	Damaged/ Debris piles; disqualified/bad concrete, demolished concrete/mason work, damaged bricks/blocks/slabs, tiles, mortars, aggregates, packages and others	Organic and inorganic
3.0	Hazardous waste			
3.1	Spent oils, grease and	Vehicle and equipment servicing at the garage and	Spent oils and grease	Organic

SN	Waste type	Location & Source	Associated activity	Composition
	lubricants	workshop		
3.2	Contaminated rugs & containers	Garage and workshop	Oil Contaminated rugs	Organic and inorganic
3.3	Chemicals	Testing of materials in workshops & laboratories at the campsite	Chemical containers, spills, spent/ expired paints	Mixed
3.4	Scrap metals	Workshop and garage	Metals, nails, poles, broken/damaged iron bars	Metals
4.0	Electronic waste			
4.1	Electronic wastes	Office workshops, garage, residence, healthcare facility	Gadgets, damaged/broken/expired test equipment, printer cartridge etc	Inorganics (a variety of metal alloys and plastic)
5.0	Medical waste			
5.1	Health care facility	Health care	Sharp objects (syringes, needles, disposable scalpels and blades, etc	Organic & inorganic
			Infectious wastes: waste contaminated with blood and other bodily fluids (e.g. from discarded diagnostic samples), cultures and stocks of infectious agents from laboratory work or waste from patients with infections (e.g. swabs, bandages and disposable medical devices)	Organic & inorganic
		Pharmacy: pharmaceutical waste	expired, unused and contaminated drugs and vaccines	Organic & inorganic

2.3.3 Operation Phase

2.3.3.1 Freights and Passengers Transportation

During the operation phase, cargo transportation would be the most important activity. This would include carriage of heavy cargo from within and outside Tanzania within the project area, including from neighbouring countries of Burundi and DRC, once the SGR is connected to those countries. Of particular importance is the transportation of minerals such as nickel and others mined from Burundi, DRC and Western Tanzania to the port of Dar es Salaam and bringing good back to those countries. Other cargo will food and cash crops such as sugar, salt, cotton, tobacco, and livestock. In addition, passengers will also use railway services for movements among locations and points. Approximately 197 staff would be employed during operation (Table 2-7).

Table 2-7: Estimated Labour Force During Operation Phase

Staffing of Stations – Required staff											
Function		Station master	Depute station Master	Station operation Assistant			Ticket Sales Assistant	Station Cleaner	Station/Yard security staff	Total Staff	Total Staff
1	Mutinde	1	1				1	1		4	
2	Kasulu	1	1	1			1	1	2	7	
3	Passing Loop	1	1							2	
4	Shunga/Lu goma	1	1				1	2		5	
5	Heru Ushingo/Ki gadye	2	2	2			2	2	6	16	
Total Staff		6	6	3			5	6	8	34	34
A) Staffing of Passenger and Freight trains – required staff											
Function		Train Driver		Passenger Train Crew							
		Engine Driver (Freight)	Engine Driver (Passenger)	Train Guard (Passenger)	Train Attendant (Passenger)	Dining Car Staff	Train Security Officer	Train Crew Manager	Total Staff		

Train Operation	8	4	4	8	8	4	2	
Total Staff	12	26						38³

Source: TRC 2023

2.3.4 Decommissioning Phase

Should decommissioning be necessary, as for the whole railway and its support services or for some of the functions, the main issues at hand will involve demolition of infrastructure (commercial buildings, railway workshops and stations, camps, sleeper production units, batch plant, borrow pits and most of the facilities that were built exclusively for construction purposes) and removal of rubble, remains and other spoil material, hazardous materials and cleaning and rehabilitating the sites. Critical issues shall include management of the materials from the demolition sites, waste disposal, noise, and dust levels due to demolition of structures and restoration of the sites. Removal and transportation of waste materials may involve use of cranes and special trailers for carrying various components to the resale markets or disposal facilities.

2.4 Project Infrastructure

The Uvinza- Kigadye SGR will necessitate the design and construction of the railway embarkment, culverts, underpasses, overpasses, bridges, as well as camp sites and offices, access roads, TPS and ATS, stations, access roads, marshalling yard, sleeper production facility, batch plant, the fence and other infrastructure. The designing of these infrastructure will be provided by TRC for the contractor to adopt/modify where necessary and implement. Where the proposed SGR crosses with existing highways or where people and livestock should cross to the other side of the SGR, overpasses and underpasses will be built

2.4.1 Railway Way Leave Corridor (Railway Corridor)

The proposed Uvinza -Kigadye SGR will require a corridor of 60m of land width throughout the main alignment, with additional land size required for stations, workers' camps, marshalling yards, and TPS/ATS, stations, workers' camps, sleeper production units, batch plants, quarry sites, borrow pits, and access roads each depending on specifications required. The corridor runs through remote area with disturbed miombo woodland, agricultural areas, scattered settlements, public and private institutions

2.4.2 Track

The track on a railway or railroad is the structure consisting of the rails, fasteners, railroad ties (sleepers), and ballast (or slab track), plus the underlying subgrade. It enables trains to move by providing a dependable surface on which their wheels can

³ This total number includes staff of both Tanzania and Burundi

roll. The track is the most important and vulnerable part of a railway system. It is expected to cross about 156.4 km of unprotected territory. The track and structures will be composed of many items designed to provide a smooth and strong riding surface for rail traffic. The Uvinza -Kigadye SGR project will be supported by sleepers attached via base plates that spread the load. A plastic or rubber pad will usually be placed between the rail and the tie plate where concrete sleepers will be used.

2.4.3 Stations

A total of four (4) main stations falling within three categories (major/category – 1, medium/category – 2, and small/ category – 3) shall be designed and built across the corridor. These are mostly elevated stations located at a clear height above the railway. The stations shall be accessible from both sides of the railway to better serve the catchment area. The areas proposed for location of main stations are Mutinde (in Rungwe Mpya ward), Kasulu (in Kumbanga Ward, Nyasha Mtaa), Shunga or Lugoma in Buhoro ward (this village was split into two and the proposed station is now in Lugoma village) and Heru Ushingo at the border with Burundi (Tanzania border station). Table 2-8 indicates names of proposed stations, land size required and their respective categories and Map 2-1 shows location of the proposed stations.

Table 2-8: Name of stations, Land sizes required and Category of Stations on the Uvinza-Kigadye SGR Line

Name of Station	Length in meters	Width in meters	Category
Mutinde	600	100	2
Kasulu	2,000	500	1
Shunga/Lugoma	600	100	2
(Heru Ushingo) (Tanzania Boarder Station)	600	80	3

Source: TRC 2023

Specifications and categorization of Stations

- **Category 1: Stations**

Category one stations are have relatively a bigger size of land and are designed to handle multitude of tasks including train servicing in a workshop area. This category of Station shall be provided in Kasulu. The design of railway stations for category 1, 2 and 3 buildings for the Uvinza- Kigadye SGR line are shown in Annex 12.6. This type of a station shall have among others, the following items:

a). Public Area, Hallways:

Access roads to the building for persons arriving by car, buses, taxi or bicycles. The entrance shall be designed to allow accessibility by disabled persons including visually impaired persons. Entrance area for passengers with security check and ticket counter

will be provided. There will be Air-conditioned waiting rooms (paid area) for passengers with tickets with public toilets for female, male and mobility impaired.

b). Office Area:

Office rooms for Station Master, secretary and administration, Workplace for the Railway Agent (with commercial duties). Temporary workplace for an Emergency Response Team and/or Maintenance Technicians and Cafe room, meeting room, staffs mess with kitchenette shall be provided.

c). Staff Accommodation:

Single bed, two bed and four bedrooms with toilet and shower for accommodation of staff will be provided to accommodate staff working in various components of the station.

d). Utility rooms:

Technical rooms for water supply, wastewater, ventilation, electrical supply and distribution, telecommunications and IT-server will be available.

- **Category II Station**

Category II Stations will be smaller in size and designed to provide basic services. These are in areas representing higher density population located within bigger agglomerations. There will be two category II stations on the Uvinza -Kigadye SGR line located at Mutinde and Shunga/Lugoma villages The buildings for category II stations shall have the following rooms/features:

a) Public Area, Hallways:

Access roads to the building for people arriving by cars, buses, taxi or bicycles. The entrance shall be designed to allow accessibility by disabled persons including visually impaired persons. Entrance area for passengers with security check and ticket counter will be provided. Also, there will be Air-conditioned waiting rooms (paid area) for passengers with tickets. Similarly, public toilets for female, male and mobility-impaired persons will be provided.

b) Office Area:

The station will have office rooms for Station Master, secretary, and administration; Workplace for the Railway Agent (with commercial duties); Temporary workplace for an Emergency Response Team and/or Maintenance Technicians. Also, a copy room, meeting room, staff mess with kitchenette will be provided.

c) Technical rooms:

Technical rooms for water supply, wastewater, ventilation, electrical supply and distribution, telecommunications, and server.

- **Category III Stations**

Category III stations are classified as a halt and are located at borders on both countries. Stops are equipped with weather protection and vandal proof seating.

2.4.4 Marshalling Yard and Workshop

The marshalling yard for the Uvinza-Kigadye SGR line will also be designed. The marshalling yard will include a campus maintenance facility or workshop which includes trackwork, civil works, drainage, earthworks, signal and telecoms work, electrical works, etc.

2.4.5 Freight Yards

As per employer specifications the freight yards will be designed for all major and medium stations. (i.e., category I and II). The design of freight facility shall provide loading and offloading section and facilities to accommodate 2,000m long train. Freight facility will consist of one marshalling line, two loading lines and a not-to-go spur (400 m), freight storage buildings, shed storage and security control facility.

2.4.6 TPS, ATS and Catenary

The power to run Uvinza-Kigadye SGR will come through the Traction Power Stations, Auto Transformer Stations, and Catenary systems designed in accordance with all relevant European Norms (EN). The system shall consist of Traction Power Stations which are connected to the grid at 220 KV, which steps down the voltage to 25KV that feeds the catenary system. The design and specifications including the distance between TPS are similarly to entire system covering TPS, ATS and Catenary and are harmonized to accommodate all SGR lines. The High Voltage Metering Units will be installed at the Traction Power Substations and provided with the capability of Transmitting data to the OCC and TANESCO offices. The construction of the 220KV power transmission line is a separate project activity and is not covered in this ESIA.

2.4.7 Fence

The Uvinza -Kigadye SGR line will be fenced on both sides throughout the alignment to prevent un-authorized crossing of the railway line. The design of the fence will follow TRC's requirements. Where fencing will result in obstruction of accessibility to critical services, crossings will be provided at appropriate locations.

2.4.8 Signalling Facilities.

The project will have safety signage and passing loops along the entire route. The control of trains into and out of railway stations and block sections safely is achieved using 3 groups of railway operating equipment. Communication equipment to allow controller at station, controller to train driver and station master to communication. Various systems will be used to facilitate this including the train dispatching system described under Telecommunications, radio and cab signalling; Block signalling systems that ensure train safety when trains are in a block section; Yard signalling systems that control the movement of trains into and out of stations safely. The design

and specifications for the signalling and communication systems shall harmonized for all SGR lines in Tanzania.

2.5 Project Requirements

The construction of the SGR Uvinza-Kigadye will require different types and quantities of materials including those obtained from within local areas. Details of the materials and quantities will be provided after the completion of the final alignment and designs however, this section highlights materials that may be sourced from the local environment and, which will have implications on the social and environmental aspects in the project area.

(i) Land

The project will require land for SGR right of way, stations, freight yards, worker's camps, borrow pits, dump sites, rock quarry sites, access roads for construction, sleeper production unit, marshalling yard and for the batch plants. The total size of land required by project components will be determined after the final approval of the SGR alignment and designs for the components. TRC will need to acquire land to meet the Uvinza - Kigadye SGR requirement. The land acquisition will inevitably result in dispossession and displacement of communities that have been using the acquired land for farming, settlements, grazing, religious /cultural functions including graves and ritual sites as well as for various social and institutional purposes. This land acquisition will result in both physical and economical displacement and loss of access to environmental services. TRC has prepared a RAP to guide the process of land acquisition and compensation. Therefore, the project must ensure that those affected by the project are appropriately compensated as per the national and international standards prior to entry to the site for any activity.

(ii) Construction Materials

All materials to be used in the construction of the rail line shall be tested in accordance with the appropriate International Standard and TRC's requirements to verify their suitability for the purpose. The actual quantities of the various bulk materials required will vary depending on the outcome of the detailed design exercise, yet to be carried out.

a). Sources of Construction Materials

Existing and new rock-quarries and borrow pits will be used for stone and gravel extraction. Currently, no specific sites have been identified as yet except that there are sources that are used for the construction of the roads under the Tanzania National Road Authority (TANROADS) and Tanzania Rural and Urban Road Authority (TARURA). These sites include borrow pits at Nyansha and Kanazi in Kasulu town and rural area that are currently being used by the contractor for the Kasulu – Mwanza Road.

The number, location and quantities of materials to be extracted from each site for the project will be provided and assessed once the contractor is secured and detailed design of the project is finalized. However, prior to extraction of materials from those

new sources, environmental assessments as well as appropriate land acquisition process coupled followed by prompt and fair compensation to affected persons must be done.

Sources of water for construction will be mainly from existing rivers within the project area. Some of the rivers identified close to the project area include Malagarasi River, Muyowosi river and its tributaries.

It is noted that the Uvinza - Kigadye section has no potential or having appropriate rock quarry due to its geological characteristics. Thus, the only main source of rock quarry was identified to be at **Ilunde Quarry site** which is operational and is along Uvinza–Nguruka road about 15 km to Malagarasi River (**Error! Reference source not found.**). The site is on a hill characterized by miombo woodland covering the hillside while the lower land and slopes descend into plains and are covered by farms with scattered settlements. Typical plant species include *Brachystegia speciformis*, *Brachystegia longifolia*, *Brachystegia boehmii*, *Jubernadia globifera*, *Terminalis brawnii*, and *Strychnonus ssp*.

Transporting construction materials from the Ilunde Quarry Site to the project area on the Uvinza-Kigadye will be extremely expensive and time consuming. Therefore, there will be need to investigate in detail the availability of rock quarry within the project site.

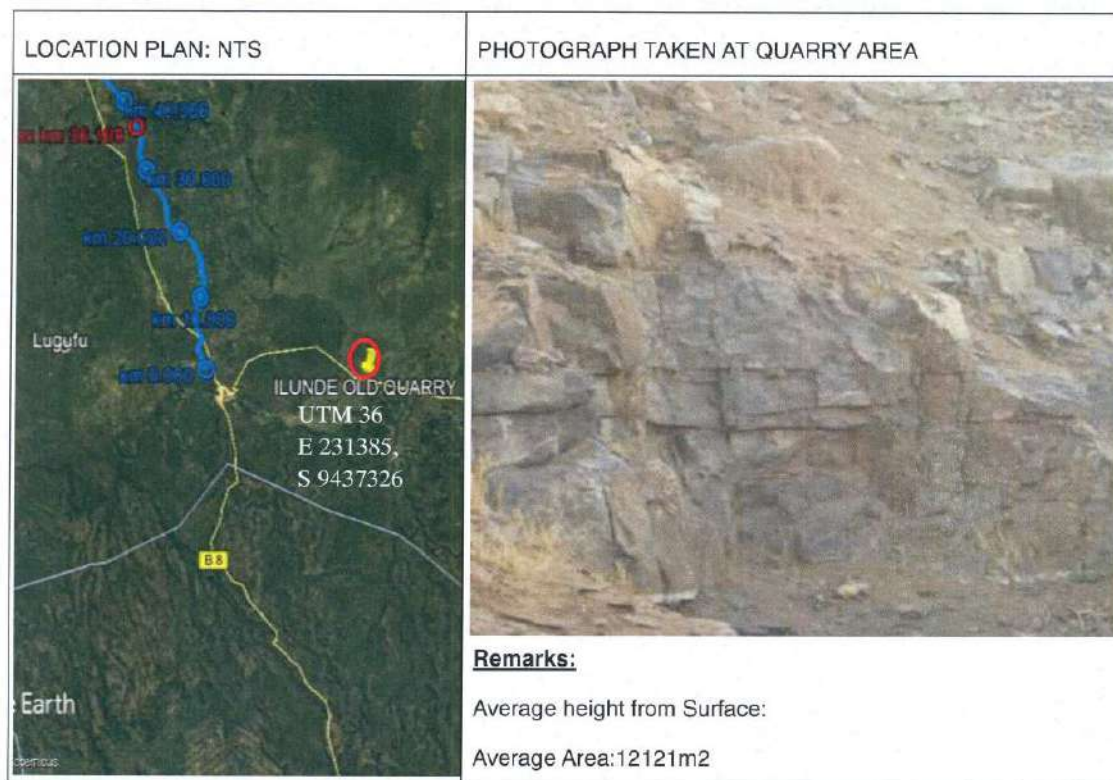


Figure 2-1: Location of Ilunde Quarry Site on the Uvinza- Nguruka Road

(iii) Logistics Arrangements

In consideration of the massive movement of construction equipment, materials, and resources during the construction phase of the project, the construction work itself will need proper logistic arrangement. Considering that the Uvinza- Kigadye SGR will be developed in an area that has no railway line (MGR), most of the initial (i.e., before the Project access road is built) project construction equipment will be transported by road and the MGR to Uvinza then wholly by road along the project site. Within the project area, roads are classified as Trunk, Regional, District, and feeder roads and some of them as well as the bridges along them, may not be suitable and capable of carrying heavy construction equipment.

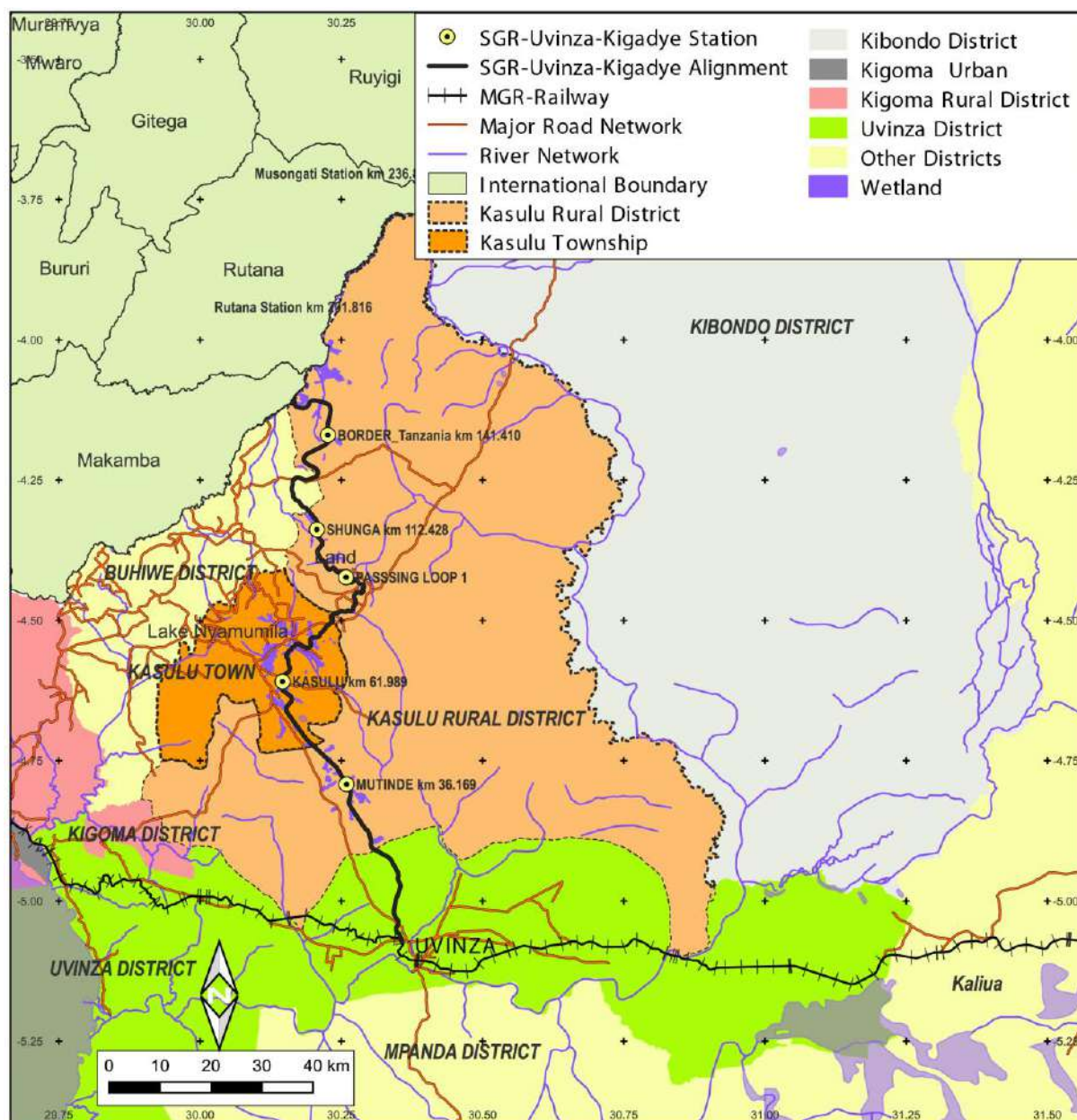
Also, most of the logistical facilities will be coordinated and operated from workers' camps to be established in various sections of the railway corridor. These camps will serve as storage areas for fuel, a worker's camp complete with water supply, electricity and communication facilities, logistics office and cranes for handling material. The operational base for the project will be selected on the basis of ability to provide easy logistical support and mostly will target already settled areas or townships with supporting infrastructure. The camps thus, will have to be built earlier than any other facility.

(iv) Other Utilities

The main supporting utilities that will need to be provided for the Project during construction and operation include water supply, solid and liquid waste management, electrical power supply and telecommunication.

(a) Water supply

Different sources of water will be required during construction and operation. This will include the use of water from rivers and catchments. The main rivers include Muyowosi River and Malagarasi River including their relative branches in project locations within Uvinza and Kasulu District areas that are managed by the Rural Water and Sanitation Authority (RUWASA). In other cases, drilling of boreholes will be considered for instance in Kasulu Town Council areas and others the sources and supply are inadequate and rivers and streams tend to get dry during dry season June, July and August. Wet season is from November, December, January, February, March and April. September and October have relatively mild rains. However, climate change effect may change the Water abstraction permits would have to be sought from Lake Tanganyika Water Basin Offices. Where water is not easily available, tankers might have to be used to ferry water, especially to the active sites, camps, and stations. The water supply during operation will be designed and installed to meet the station's flow requirements. Map 2-3 shows river network in the project area.



Map 2-3: River network in the project area

(b) Wastewater

During construction, mobile toilets will be supplied to the construction sites, while at the workers' camp septic tanks will be used. During operation wastewater shall be disposed of by means of pipeline connections leading to underground lines and septic tanks. Outdoor wastewater lines shall have a minimum diameter of 100 mm and unless otherwise stated, a minimum longitudinal slope of 0.5%. Underground wastewater lines shall have to be installed with a minimum cover of 60 cm. Currently, there are no designated public wastewater systems in all project areas from Regional to District level. In this case, new facilities will have to be provided through the Project for

wastewater management. In remote areas, discharge of wastewater will be through a septic tank system.

(c) Storm Water Drainage

The new and existing surfaces around new structures and associated facilities shall be provided with positive surface slopes in order that rainfall run-off does not collect adjacent or seep into the ground water system in the vicinity of structures, embankment and associated facilities. Storm water drainage systems shall be designed to direct storm water away from structures. Ditches, swales, and open channels shall have a minimum longitudinal gradient of 0.5%. Routing of surface or roof storm water to green areas shall only be done to a limited degree to avoid both soil erosion and water logging of green areas. Slopes and elevations on green areas shall not be such that surface water can easily run on to pavements from green areas.

Furthermore, hydrological studies to guide the design process must be carried during the detailed feasibility assessment and geotechnical assessment, that the Contractor will carry out prior to commencement of construction and detailed designing. TRC in collaboration with the procured contractor shall agree the time to commence this critical study. Considerations must be taken on the effect of climate change potential vulnerable flooding area in the Project areas, such as Malagarasi flood plains, and Nyamgongo and Ruhita wetland areas and within several flood plains of the rivers and streams where the SGR traverses. Specific designs will provide the number and position of structures to accommodate the volume of storm water.

(d) Electrical Power Supply

A stable power supply will be needed during construction and operation phases. Major expected uses of supply will be for camps, sub camps, construction sites, sleepers' production factory, quarries, and mechanical workshops during construction as well as for train operations, marshalling yard and workshops, station operations, rolling stock maintenance and office building lightning during operation phase. TANESCO is expected to supply power through 220 kV power transmission line into substations and via its network to these mentioned project facilities.

Complete electrical installation for all buildings and workshops including main connection, distribution lines and cables, outlets etc will be undertaken. Electrical lighting will be installed in all rooms and outside paved areas to provide lighting for security as well. In remote sites, solar collectors and generators shall be installed for lighting and for the technical equipment permanently. Only a small size installation will be needed since the consumption is expected to be moderate. Emergency power supply will be required throughout including generators.

(e) Communication and IT Servers

Telecommunication connection, internal wiring and telephone system will be required. IT – cables, outlets and server shall be installed. In remote areas telecommunications will be carried out by radio and mobile phones.

CHAPTER THREE

3 PROJECT ALTERNATIVES

Consideration of alternatives in the ESIA process is crucial as it provides the opportunity to analyse different means of meeting the same purpose of a proposed activity. This helps to make better and more informed decisions and thus, achieve the same or better results with less negative effects including costs. This section considers two alternatives from the four that were identified during scoping from which two have been incorporated into the design.

3.1 The “No Project” Alternative

This alternative refers to the option of not undertaking the proposed railway construction project or any of its other alternatives. Adopting this option would surely avoid most of the negative effects associated with the project but also will lose many benefits associated with the project however, this alternative means the railway link from Uvinza- Kigadye would not be constructed, making it impossible to exploit the nickel deposits at Msongati in Burundi because there will be no link to that area. In fact, this option conflicts with several national and international agreements between EAC member states. Such a decision would lead to a continuation of poverty and unreliable infrastructure which, negatively will affect production and social development in western Tanzania. More importantly, the option would mean continuation of the people’s hardships and poor regional development. The ‘no project’ alternative only serves to show what will happen to the status quo but it is not a development option under these conditions and circumstances.

3.2 Project Corridor Alternatives

During feasibility study, the corridor investigation and analysis were done in consideration of three alternative options. All three corridor options were subjected to investigations and analysis aiming to determine the most feasible alignment corridor in terms of technically, economically, environmentally, and social aspects. During the development of these corridor alternatives, areas of conflicts which are probably difficult to resolve (e.g., national parks, critical subsoil conditions, political risks and interests, hydrological conditions, etc.) were avoided wherever possible. The three developed corridor alternatives were defined as Corridor 1, 2, and 3.

The focus was the area of branch-off at Uvinza on the Tabora - Kigoma section and how to proceed to Musongati. On specific corridor sections, attention was paid to areas with difficult topographical and geological conditions and where the proposed alignment was to pass near environmentally sensitive areas or where existing roads and rivers are crossing.

3.2.1 The Corridor 1 – Uvinza-Makere-Kitanga

The total length was 170 km. The first 30km is flat and then relatively hilly as it approaches Kitanga. The Corridor passes at the bottom of the valleys until when it branches off the central line west of Uvinza, shortly behind the town and heading almost straight North. At about 45 km northeast of Kasulu, Corridor 1 crosses the national highway B8 near Makere. For almost 60 km the alignment runs almost parallel to the B8 highway. Before crossing the river Malagarasi, the alignment turns northwest to Kitanga village, the border with Burundi. These extreme conditions require several bridges and viaducts. In this corridor, travel time is expected to be higher due to the topographical conditions that might force speed reductions in certain sections of the alignment. The most specific aspect of this Corridor is that it traverses the western plains of the Malagarasi River from Uvinza, which has a wildlife corridor since in this area, elephants move between Moyowosi, Burigi and Kisigo Game Reserves and contains several important wildlife species, including those threatened and on IUCN Red List of key stone species (e.g., elephants, sitatunga roan).

3.2.2 Corridors 2 - “Uvinza-Kasulu-Kigadye

The feasibility study for Uvinza- Kasulu Kigadye Corridor” was adopted as an option to connect Kasulu with overall alignment length of 156.4km. The general topographical conditions is comparable to those in Corridor 1. Corridor 2 branching off the central line west of Uvinza, shortly behind the town. The alignment climbs a slope and heads North and runs near the national trunk road B8, on the east side, to avoid a swampy area east of trunk road B8 the corridor is forced to crossroad B8 twice, one time south of the village Mutinde and the second time north of Mutinde. From here to Kasulu and about 15 km northeast of Kasulu, the Corridor 2 runs parallel to road B8 again. East of the Village Nyakitonto the Corridor crosses road B8 again and running parallel at its northern side. Near Mugombe the Corridor turns northwest and winding up to the north and to Kigadye at the border with Burundi.

Corridor 2 shows favourable operational conditions. Travel time both for passenger and freight trains is shorter compared to Corridor 1. This corridor traverses’ areas off both the Core Conservation Areas outside Gombe National Park and the Greater Gombe Ecosystem but cuts across Masanza Forest Reserve several sparsely populated areas

3.2.3 Corridors 3 - Kigoma-Buhigwe-Nyamugali

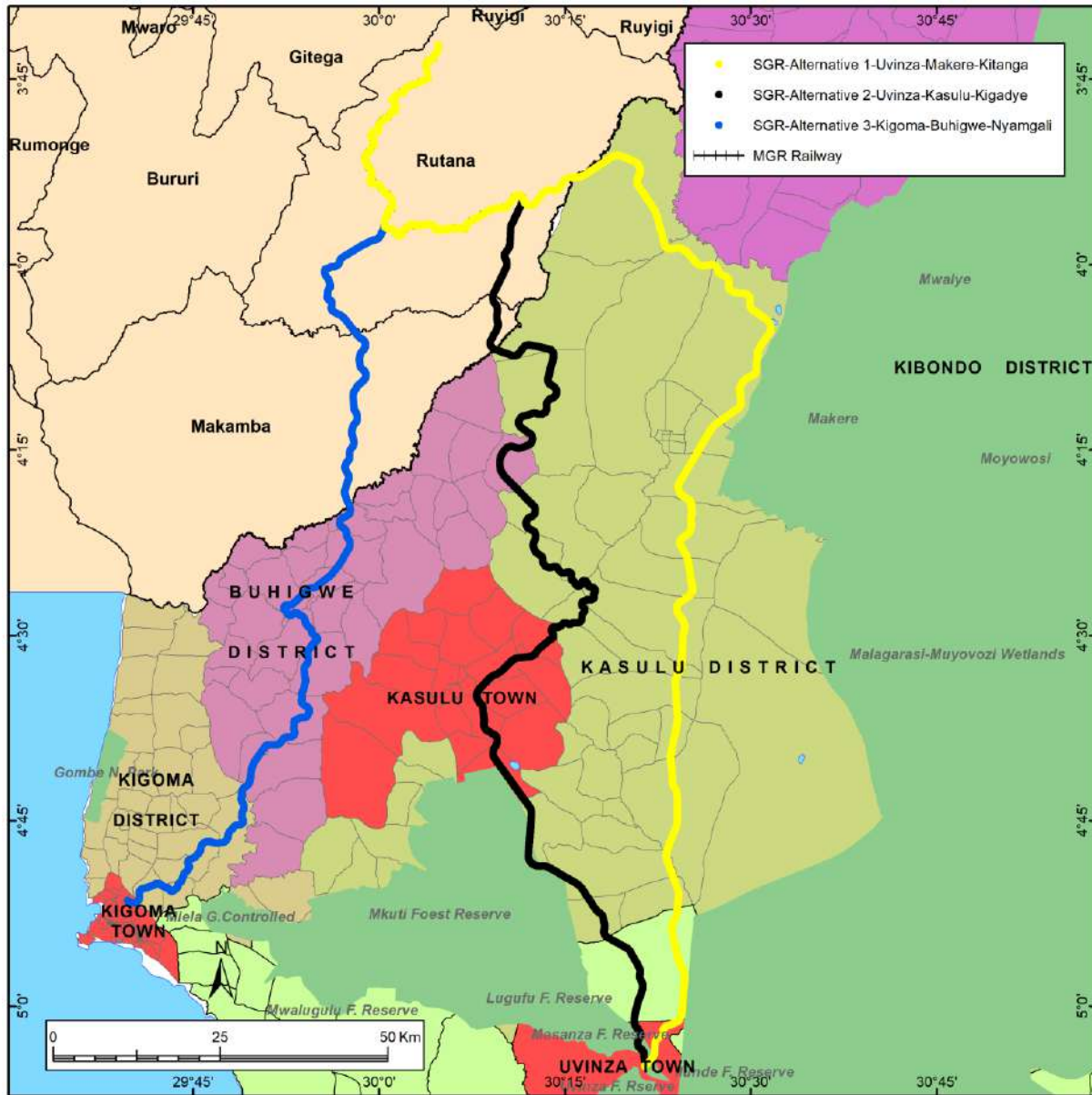
The overall length of Corridor 3 is 89.3km. This is the shortest corridor that starts at Kigoma and not near Uvinza as Corridor 1 and 2. Due to difficult topographic conditions, Corridor 3 requires a considerable number of bridges and viaducts to reach Nyamugali, a village at the border with Burundi. This corridor might be relatively expensive given the required engineering works that may be needed because it traverses close to the eastern arm of the western Rift Valley. The most specific aspect about this corridor is that it traverses areas close to Gombe National Park, an area that has community of

chimpanzees. In addition to wildlife, this corridor is on a plateau where settlement and plantation farming have concentrated.

3.3 Recommended Corridor:

After weighting all the options, the Uvinza – Kasulu – Kigadye Corridor (Corridor 2) was recommended as the "preferred option" as it exhibits favourable conditions, especially with regard to;

- Corridor length
- Ecological and Environment issues
- Operational conditions / Traffic and transport criteria
- Easy in accessibility during construction



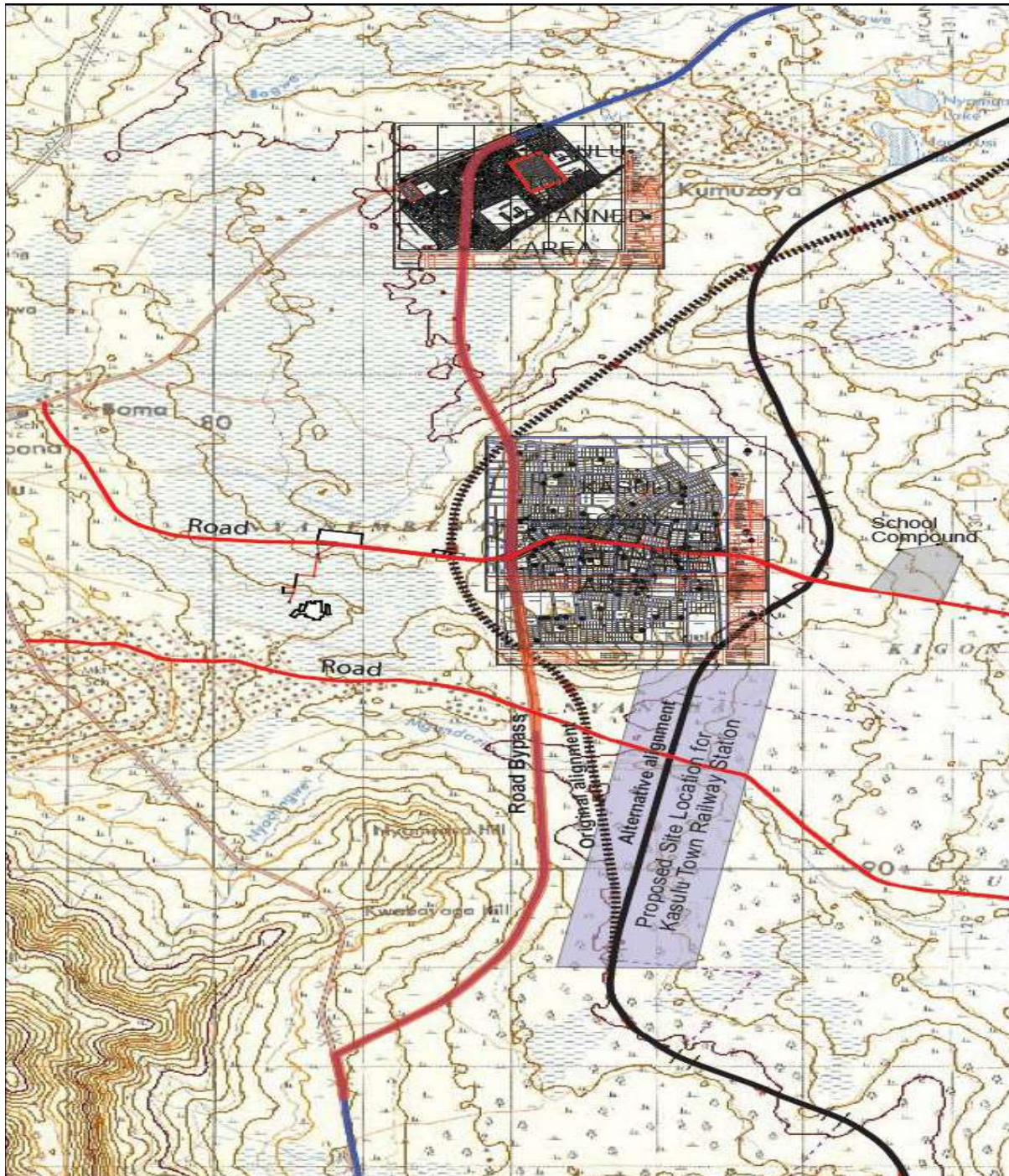
Map 3-1: Showing alternative proposed corridors

3.4 Alternative alignment to avoid Kasulu road by-pass

In a continuation of the recommended Uvinza – Kasulu – Kigadye corridor", the original proposal was interfering with the proposed road bypass, which aimed at avoiding traffic congestion in Kasulu town centre. The Town council is also proposing to locate the main bus stand along this road bypass and therefore the original railway line proposed alignment would also affect the planned main bus stand.

To avoid the proposed railway line interfering with the proposed bus stand, it is now decided that the railway line be shifted about 2.5 km to the east, so that the railway station is linked to the existing access gravel road which is also the proposed access road to the bus stand and the town canter (Map 3-2). Thus, there are two alternative

roads to the railway station 1) the existing access road to Murufiti Ward, and (2) the proposed access road within the approved Town Plan.



Map 3-2: Alternative Location of Railway Line at Kasulu Town

3.5 Alternative Alignment to avoid a Sensitive Government Institution

The initial alternative was traversing close to a sensitive government installation that was previously a refugee camp but now turned into a military camp. Recently, the government undertook an extension of the boundaries of the said Camp which, has resulted in the SGR alignment, Shunga Station and a passing loop all being inside the military camp. The Government has plans to expand building extending to the area the SGR was initially crossing. Valuation of the affected properties and people have already been done. Also, the current SGR alignment cuts across several streams that feed the Camp. therefore, in view of the sensitivity of this location, it is recommended to realign the SGR away from the extended boundaries of the Camp by about 500m going southwest (Map 2-2).

3.6 Considering Climate Change Impacts and Scenarios in assessing project alternatives

It is clear that the recommended current provisional alignment did not consider the projections and impacts of Climate Change. However, it is worth noting that this alignment is subject to change to a fixed alignment after design whereby Climate Change impacts should be taken onboard from design stage to operation stage which will include of various structures and facilities designing methods, type of construction materials, types of railways fixing materials and spare parts to be used as well as maintenance schedules. All these aspects will be guided by the geotechnical and hydrological studies that will be undertaken

CHAPTER FOUR

4 POLICY, LEGAL AND ADMINISTRATIVE FRAMEWORK

4.1 Introduction

The development of SGR from Uvinza to Kigadye will attract the application of various legislations and the project owner (TRC) must adhere and strictly comply with all the pertinent regulatory requirements including national and African Development Bank. The objective of this Chapter is to understand the key provisions of regulatory framework related to the environmental and social aspects of the proposed project activities.

4.2 National Policy, Legal and Institutional Framework

4.2.1 The Constitution of the United Republic of Tanzania

The United Republic of Tanzania Constitution of 1977 (Amended from Time to Time) is the supreme law of the country and fits in the legal framework because it plays two major roles; first it is a grand norm, the instrument which all other laws of the country derive their legitimacy. That means, all the laws enacted in the country must conform to it and should not be inconsistent with the constitution.

Therefore, all the laws enacted to regulate the rail transport sector in Tanzania derives their legitimacy from the constitution as provided in Article 64. -(1) which state that “Legislative power in relation to all Union Matters and also in relation to all other matters concerning Mainland Tanzania is hereby vested in Parliament”. Secondly, the constitution allows freedom of movement, that the citizens of United Republic of Tanzania are free to move within and out the boundaries of the country. This means the constitution allows the movement of passengers and goods, the provision necessitated the construction and provision of transportation infrastructure and services which includes the railway transport sector.

The Constitution of the United Republic of Tanzania came into operation on the 26th of April 1977. It is a fundamental law and considered the foundation of all other legislation enacted in the Republic of Tanzania. The right to give and receive information is enshrined in the Constitution, which includes the giving and receiving of information on environment and natural resource management.

Since all laws spring from the Constitution, it is mandatory for every one including investors and developers (TRC in this case), to ensure compliance and adherence of the laws. Following the completion and approval of the ESIA report by the Minister responsible for Union and the Environment in the Vice President's Office, an Environmental Certificate is issued as per the laws. This certificate contains specific and general conditions that the developer, his contractors and subcontractors are required to comply with. Key elements in these conditions are recommendation provided in the Environmental and Social Management and Monitoring Plans that have been prepared

as part of the ESIA that has been approved. It is this document (ESMP) that will be used to assess compliance of the developer in all required measures.

In addition, the Contractor is also required to prepare Contractor's Environmental and Social Management Plan (CESMP) that will resonate to a large extent the ESMP that has been approved in the ESIA and submit it to TRC on how he will implement it. This will be a document that TRC will be using to check on accountability and compliance to implementation of the measures. Other key plans and procedures to deliver compliance shall include among others, a RAP report, Labour Influx Management Plan, Security Management Plan; Sexually Transmitted Disease Management Plan; Off-site Working Procedures; fatal Traffic Accident Analysis Report. Others may include Health and Safety Management Plan; Traffic Management Plan; Blasting and Explosives Procedures; Community safety Operation Management Plan; Biodiversity Action Plan etc. These plans and procedures shall ensure compliance to several environmental and social and cultural aspects within the project area.

Drawing lessons from on-going SGR construction projects in Lots 1 to 5, TRC has engaged an external monitoring institution – Independent Environmental and Social Consultant (IESC) that carries out quarterly monitoring of project implementation and compliance to national and international laws. With these measures in place, it is expected that the contractor and TRC will deliver compliance in all critical aspects of the project including, adhering to the provision of these policies and laws as well as the approved ESMP.

4.2.2 Policy Framework

Several national policies and strategies are applicable to the proposed SGR project and are provided in Table 4-1.

Table 4-1: Applicable National Policies and Strategies

	Policy	Relevant sections
1	National Environmental Policy of 2021	<p>The key objective of the National Environmental Policy (NEP) is:</p> <ul style="list-style-type: none"> • To strengthen coordination of environmental management in sectors at all levels. • To enhance environmentally sound management of land resource for socio-economic development. • To promote gender consideration in environmental management. • To ensure predictable, accessible, adequate, and sustainable financial resources for environmental management <p>Critically, the National Environmental Policy emphasizes the application of Environmental Impact Assessment</p>

	Policy	Relevant sections
		<p>studies in order to identify and propose mitigation measures for risks and impacts arising from development projects.</p> <ul style="list-style-type: none"> • It encourages the development of sustainable regimes for soil conservation and forest protection, taking into consideration the links between desertification, deforestation, freshwater availability, climatic change, and biological diversity <p><i>This Environmental Impact Assessment (EIA) is in line with the NEP directives and provides mitigation measure that the developer (TRC), the Contractor and sub-contractors are required by law to adhere and report annually, the implementation of mitigation measures through a prescribed Monitoring process to the National Environment Management Council. Failure to do is invites penalties.</i></p>
2	National Community Development policy of 1997	<p>The policy puts in place measures that enable communities to realize their potential through wise utilization of natural resources.</p> <p>Objectives of Community Development Policy: The major objective of the Community Development Policy is to enable Tanzanians as individuals or in their families and/or groups/associations to contribute more to the government objectives of self-reliance and therefore bring about development at all levels.</p> <p><i>The proposed SGR project has several undertakings which are directly linked to the community and their respective development such as employment, business, improvement of infrastructure as well as surrounding communities and township growth. However, since land is a resource that is mainly depended upon by local communities for their development, losing land may have severe consequences on community development.</i></p>
3	National Cultural Heritage Policy of 2008	<p>The Cultural Heritage Policy provides guidance on the implementation of the Tanzania Antiquities Act (Act No. 10 of 1964; amended 1979, Act No. 22) for government and non-government stakeholders. Key elements of the policy include the following:</p>

	Policy	Relevant sections
		<ul style="list-style-type: none"> • Defines the roles and responsibilities of different cultural heritage stakeholders. • An analysis of the ways in which cultural heritage activities are managed and administered by the government. • Clarifies measures by which cultural heritage resources will be protected, managed, preserved, conserved, and developed; and • An analysis of best practices for conducting research and conservation of cultural heritage resources. <p>A key element of the policy is the stipulation that cultural heritage impact assessments should be mandatory prior as part of private and public development projects (MNRT 2018).</p> <p><i>The proposed SGR project will ensure compliance of this policy by applying chance find procedures throughout implementation.</i></p>
4	National Energy Policy of 2015	<p>The first energy policy for Tanzania was formulated in April 1992. Since then, the energy sector has undergone several changes, necessitating adjustments to this 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 this Policy 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.</p> <p>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 stop this decline, the government gave priority to the upgrading of basic economic infrastructure, especially communication, so that they can fully support the production sector.</p> <p>The operation phase of the proposed SGR is expected to use electricity <i>in train operations, marshalling yard, maintenance workshops, sleeper factory, rolling stock</i></p>

	Policy	Relevant sections
		<i>maintenance, stations operation and office buildings lightning and therefore adherence to this policy principle.</i>
5	National Forestry Policy of 1998	<p>The national forest policy is based on 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) in regard with forest resources management.</p> <p>Over the past three decades the perspectives on the role of the forest for society have changed and broadened considerably because of social, economic, environmental, cultural, and political changes. On the other hand, there have been relentless pressures on the forest resources arising from the ever-increasing demand for fuelwood, fodder, timber, and demand of forest land for other uses. The overall aim of this policy 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.</p> <p>The proposed SGR route passes through Forest Reserves. The forest policy advocates for a permit and directs the conduct of EIA for development projects that will affect forest reserves including services crossing them (e.g. railways).</p> <p><i>The proposed SGR project will ensure that policy provisions are adhered to throughout project implementation</i></p>
6	National Land Policy of 1997	<p>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 endangering the ecological balance of the environment".</p> <p><i>This ESIA responds to envisaged policy requirement providing mitigation measures from the project implications on land resources and land tenure and may</i></p>

	Policy	Relevant sections
		<i>lead to spiraling of land degradation as well as land dispossession for the local land users.</i>
7	National Water Policy of 2002	<p>The overall objective of this policy is to develop a comprehensive framework for the sustainable management of the national water resources. The policy seeks to ensure that water plays an important role in poverty alleviation.</p> <p><i>The SGR project will use water for various activities and will ensure the sustainable use and management of water including the enhancement of water resources management within the project influence area</i></p>
8	National Employment Policy of 2021	<p>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 labour force and tapping available natural resources.</p> <p>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 that require special treatment while seeking employment and proposes responsibilities of different authorities to deal with different aspects of the policy.</p> <p><i>The proposed SGR project is expected to provide employment to local people during construction and operation and therefore it adheres with this policy.</i></p>
9	National Transport Policy of 2003	<p>The mission of this policy is to "Develop safe, reliable, effective, efficient, and fully integrated transport infrastructure and operations which will 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".</p> <p><i>The proposed SGR Project will, in the success scenario, contribute towards delivering efficient and cost-effective</i></p>

	Policy	Relevant sections
		<i>domestic transport service to all segments of the population along the alignment and sectors of the national economy with maximum safety and minimum environmental degradation.</i>
10	National Health Policy of 2017	<p>The objective of this policy is to:</p> <ul style="list-style-type: none"> • provide geographically balanced and in acceptable standards, affordable and sustainable health services in general. • uplift the health status of the citizens, especially the vulnerable groups by putting in place health infrastructure that meets community expectations and increase life expectancy of Tanzanians. • To prevent and control infectious and non-infectious diseases especially HIV/AIDS, malaria, tuberculosis, malnutrition, and workplace diseases. <p><i>The proposed SGR may trigger health challenges including those that this policy is concerned about but also is expected to contribute significantly to other objectives of this policy as it will enhance accessibility.</i></p>
11	National HIV and AIDS Policy of 2003	<p>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 implication on social services and welfare. Thus, the policy recognizes the linkage between poverty and HIV/AIDS, as the poor section of the society are the most vulnerable.</p> <ul style="list-style-type: none"> • Prevent of transmission of HIV/AIDS. • Enhance sectoral roles through participation and financial support; and • Promote and participate in research on HIV/AIDS, including dissemination of scientific information and development of HIV vaccine. <p><i>The proposed SGR project can be a precursor of incidents of HIV/AIDS due to the high influx of people into the project area to seek for jobs and income. The situation can</i></p>

	Policy	Relevant sections
		<i>result in increase in the incidence of diseases including STI, and HIV/AIDS therefore the Policy directives on the prevention of transmission of HIV/AIDS must be complied with during the implementation period.</i>
12	National Gender Policy of 2002	<p>To provide guidelines that will ensure that gender sensitive plans and strategies in all sectors and institutions are developed.</p> <p>It puts emphasis on 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 the society.</p> <p><i>The construction and operational phase of the SGR project will employ both men and women hence this policy requirement is applicable.</i></p>
13	National Livestock Policy of 2006	<p>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.</p> <p>The Policy has considered the comparative advantage the country has as regards to 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 direct impact on the development of the livestock industry. The Policy further emphasizes on the importance of value addition to access competitive markets and to prolong shelf life of livestock products.</p> <p><i>There are several pastoralists along the railway alignment that crosses the SGR. The SGR may have both benefits and impacts on the livestock sector and therefore this policy becomes relevant by proper planning and designing of underpasses and overpasses along livestock keeping communities.</i></p>

	Policy	Relevant sections
14	National Climate Change Strategy of 2012	<p>To enable Tanzania to effectively adapt to climate change and participate in global efforts to mitigate climate change, whilst also achieving sustainable development.</p> <p><i>The objective of SGR project is in line with the 2012 National Climate Change Strategy by factoring in climate change scenarios from the designing stage of fixing the alignment.</i></p>
15	National Wildlife Policy 2007	<p>This policy visions for protection and conservation of wildlife and wetlands.</p> <p>Management and development of wildlife and wetland resources.</p> <p><i>This ESIA provides measures to be taken in areas with potential wildlife.</i></p>
16	National Agriculture Policy of 2013	<p>The objective of the policy is to develop an efficient, competitive and profitable agricultural industry that contributes to the improvement of the livelihoods of Tanzanians and attainment of broad-based economic growth and poverty alleviation. The policy highlights the challenges facing the agricultural sector in Tanzania and opportunities that would lead to increased production and productivity if utilized effectively. Related to this project, one of the key challenges in facing the sector is poor infrastructure.</p> <p><i>The SGR project in a success scenario, will promote the expansion of domestic, regional and international market opportunities for various agricultural commodities through safe, fast, reliable and cost-effective movement of agricultural products between markets. In addition, it will promote the growth of agribusinesses and medium to large-scale farms and hence the increase in rural jobs market.</i></p>
17	The National Occupational Health and Safety Policy of 2010	<p>This policy aims for prevention and control of hazards at workplaces and adaptation of work processes and environment to workers to increase their productivity.</p> <p><i>SGR Project will engage unskilled and skilled workers,</i></p>

	Policy	Relevant sections
		<i>Contractor and Employer will be obliged to ensure provision of safe working environment by providing proper and adequate protective gear as well as working tools along with frequent toolbox trainings throughout the project implementation.</i>

4.2.3 Legal Framework - Acts

Several national laws and regulations are applicable to the proposed SGR project as given Table 4-2

Table 4-2. Applicable National Laws

	Acts	Relevant sections
1	The Environmental Management Act, 2004, Written Law (Miscellaneous) (No. 3) Act, 2016 and 2021;	<p>The main legislative which provides for legal and institutional framework for sustainable management of environment; The Act outline principles for management, impact and risk assessments, prevention and control of pollution, waste management, environmental quality standards, public participation, compliance, and enforcement, to provide for implementation of the National Environment Policy.</p> <p>Part VI of EMA (2004) expresses the need of EIA and other assessments and directs that EIA is mandatory for all development projects (Section 81(2)).</p> <p><i>TRC commissioned the EIA in compliance with the Environmental Management Act, they shall be required to commit to implementing the Environmental and Social Management, and Monitoring Plan (ESMMP) laid out in this Report and any other conditions prescribed by NEMC, prior to being issued an EIA certificate. The SGR project will comply with EMA directives by following the EMA requirements and related regulations and standards.</i></p>
2.	The Railway Act, 2017	<p>The Act was passed in 2017 to replace the Railways Act No.4 of 2002. This act facilitated the establishment of the new railway company, Tanzania Railway Corporation (TRC), (the Employer).</p> <p>It guides the development, maintenance and promotion</p>

	Acts	Relevant sections
		<p>of the railway infrastructure, rail transport services and related matters.</p> <p>The Act gave power to TRC to acquiring, holding, and alienating movable and immovable properties; Borrowing and lending; entering any contract or any other transaction</p>
3.	The Forest Act, 2002	<p>This Act deals with the protection of forests and forest products in forest reserves, the restrictions, and prohibitions in forest reserves. Forest Management plans are administered under the Forest ordinance (1957).</p> <p>The current Forest Act No 14 of 2002 requires that for any development within a Forest Reserve, Private Forest or Sensitive Forest, the proponent must prepare an Environmental Impact Assessment for submission to the Director of Forestry.</p> <p>The law also requires licenses or permits for certain activities undertaken within the national or local forest reserves, such as, among others, felling or removal of trees, harvesting forest produce, entering a forest reserve for the purpose of tourism or camping, mining activities, occupation or residence within the reserve, cultivation, erecting any structures.</p> <p><i>The SGR route passes through the national and community Forest Reserves. The SGR project will engage with the forestry stakeholders and acquire all the necessary permits to ensure that provisions of this act are adhered to throughout project implementation.</i></p>
4.	The Occupational Health and Safety Act, 2003	<p>This law requires employers to provide a good working environment for workers to safeguard their health.</p> <p><i>The ESIA has taken into consideration the potential for occupational health issues associated with the Project and appropriate mitigation measures have been outlined in this report. The project will contractually oblige its contractors and suppliers to adhere to the Operational Safety and Health Act 2003.</i></p>
5.	The Wildlife Conservation Act No 5/09 of 2009	<p>Section 74 of the Act states that "A human activity, settlement or any other development that will adversely affect wildlife shall not be permitted within five hundred</p>

	Acts	Relevant sections
		<p>meters from the wildlife protected area borderline without the permission of the Director."</p> <p><i>The EIA will consider the extent to which the Project will interact with species that are afforded protection through international laws and treaties. TRC and its contractors will comply with the requirements of this Act where applicable</i></p>
6	The Explosive Act Cap 45 R.E 2002	<p>The explosives act provides custody for regulating explosives in Tanzania; the act prohibits none to participate in making explosives prior issues of the license. This prohibition includes import, manufacture, possession, acquisition, or disposition of explosives.</p> <p>The Commissioner for Mines to may legally issue a permit to manufacture and use explosives for purposes of blasting. Part V of the Act further requires a permit for transport of explosives. Part VI requires a permit for acquisition, possession, and disposal of explosives. Part VII requires a permit for storage of explosives. An explosive can give conditions.</p> <p><i>The SGR project will engage with the relevant stakeholders and acquire all the necessary permits to ensure that provisions of this act are adhered to throughout project implementation.</i></p>
7.	The Land Act Cap 113 R.E 2019	<p>The Act address various issues including defining the legal framework for land tenure system, and how land could be used for social and economic development.</p> <p>The Act also defines issues of land acquisition and compensation to the affected people.</p> <p>It further provides guidance to land ownership/land tenure in Tanzania.</p> <p><i>The SGR project involves resettlement of people and their properties; the project is committed to follow the whole process of valuation and compensation in alignment with the requirements of this law.</i></p>
8.	The village Land Act, Cap 114 R.E 2019	<p>The Act was enacted specifically for the administration and management of land in villages.</p> <p>The Act give power to village council for management of the village land in accordance with the principles of a trustee managing property on behalf of a beneficiary. The</p>

	Acts	Relevant sections
		land requires to be managed with respect to sustainable development, relationship between land uses, other natural resources, and the environment
9.	The Water Resources Management Act, 2009	<p>The Act provides the 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 participation of stakeholders and the public in implementation of the National Water Policy.</p> <p>Water demand for the SGR Project is anticipated to be extensive for construction, dust suppression and for use in the works camps, although appropriate permits will be obtained, and their conditions met for water used by the Project.</p> <p><i>The SGR Project will extract water from several surface water and groundwater sources. The project will acquire all the relevant permits and will strive to meet all the permit conditions, eg. Water use will need to be monitored and reported to the relevant Water Authority to ensure permit conditions are adhered to.</i></p>
10.	The HIV and AIDS (Prevention and Control) Act, 2008	<p>The law provides for public education and programmes 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 for the purpose of providing 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 programmed on HIV and AIDS for employees under his control and such programmes shall include provision of gender responsive HIV and AIDS education”.</p> <p><i>The Project Contractor will develop and implement an HIV/AIDS policy and information document for all workers directly related to the Project.</i></p>
11	The Employment and Labour Relations Act Cap 366 R.E 2019	<p>The Act makes provisions for core labour rights, to establish basic employment standards, including prevention and settlement of disputes.</p> <p>Part II of the Act describes fundamental rights and protections for child labor, forced labor, discriminations,</p>

	Acts	Relevant sections
		<p>and freedom of associations while Part III provides for employment standards, which include issues like Hours of Work, Remuneration, Leave, Unfair Termination of Employment and Other Incidents of termination.</p> <p><i>TRC and Contractor shall ensure that recruitment and human resources aspects of the project are adheres to employment standards and requirements set out in this Act</i></p>
12	The Grazing Land and Animal Feed Resources Act, 2010	<p>An Act to provide for the management and control of grazing-lands, animal feed resources and trade related to animals.</p> <p><i>The SGR Project is expected to touch grazing land in different villages along the way leave. This ESIA for the Uvinza -Kigadye SGR project will provide mitigation measures to minimize impact on grazing land.</i></p>
13	The Antiquities Act No. 10 of 1964 and Amendment No. 22 of 1979	<p>Principal legal instrument for the preservation and protection of sites and articles of Paleontological, Archaeological, Historical or Natural interest</p> <p><i>The ESIA will address issue relevant to this Act and make specific recommendations to protect those cultural and historical resources that may be found during the construction of the railway line.</i></p>
13	The Mining Act Cap 123 R.E 2019	<p>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 to produce lime, or material used for the manufacture of cement.</p> <p>This act make 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</p>

	Acts	Relevant sections
		<p>Act".</p> <p><i>The SGR project shall apply for relevant mining permits before starting sand, gravel and/or other mining activities. Where these materials are sourced from suppliers, the project will ensure that they are licensed and compliant prior to using their services.</i></p>
14	The Land Use Planning Act of 2007	<p>The Land Use Planning Act provides procedures for the preparation, administration, and enforcement of land use plans. It aims at protecting the environment of human settlements and of ecosystems from pollution, degradation, and destruction to attain sustainable development.</p> <p>Section 22 of the Act gives power to Local Government Authorities to secure orderly and environmentally sustainable development in the village, ward and to preserve the land resources including forest and wildlife.</p> <p><i>The SGR project entails defining a 30m (either side of the centerline) right of way resulting in acquisition of additional land for the project. The Lands Act regulates all issues of land acquisition.</i></p>
15	The Land Acquisition Act Cap 118 R.E 2002	<p>This Act provides for the compulsory acquisition of lands for public purposes and in connection with housing schemes. The Act empowers the President to acquire any land for any estate or term where such land is required for any public purpose. The Act (section 11) provides procedures for compensation to landowners or land users when acquired land for project development interferes with their access to or use of land.</p> <p>However, the Act has no provisions requiring the disclosure of the Resettlement Action Plan or the Livelihood Restoration Plan if they are required when a project interferes with people's livelihoods. Some of the project components will require the acquisition of land. Therefore, international standards will apply if their properties to be affected or people to be displaced.</p> <p><i>TRC shall ensure compliance with the requirements of this Act during the whole resettlement and compensation process.</i></p>
16	The Urban Planning Act, No. 8 of 2007	<p>The objectives of the Act, among others, include making serviced land available for shelter and human settlements development in general to all sections of</p>

	Acts	Relevant sections
		<p>community; improve the level of the provision of infrastructure and social services for sustainable human settlements development. Section 29 of the Act provides for issuing planning consent and submission of ESIA report. It states that no person shall develop any land within a planning area without planning consent granted by the planning authority. The application for planning consent to develop land must be accompanied by ESIA report for all proposals concern industrial location, dumping sites, sewerage treatment, quarries or any other development activity which is likely to have injurious impact on the environment.</p> <p><i>The ESIA for the proposed SGR project shall respond to the requirement of the Urban Planning Act and particularly section 29 and addressing significant impacts associated with the proposed development as well as possible mitigation measures to minimize the impacts.</i></p>
17	The Land Transport Regulatory Authority Act, 2019	<p>The Act has the established the Land Transport Regulatory Authority to regulate land transport sector. The Authority has empowered to coordinate land transport safety activities; register crew and certify drivers of regulated; certify worthiness of rolling stock and road worthiness of public service vehicles and goods vehicles; as well as to issue, renew and cancel permits or licenses.</p> <p><i>Project proponent will observe the provisions of this act as some of the components will require the development of access roads and most of the construction materials will be transported by road.</i></p>
18	Water Supply and Sanitation Act, No.5 of 2019	<p>The Act provides for the institutional and legal framework for water supply in urban and rural areas. It provides for prevention and control of water pollution and participation of stakeholders and public in implementation of the National Water Policy.</p> <p>Furthermore, the Act provides the measures to control water quality and quantity for the community use and protect the aquatic ecosystems. Water supply and wastewater management is of paramount importance for sustainability of the project.</p>
19	Energy and Water Utilities Regulatory Authority Act of 2001	<p>The Act is responsible for regulating energy development and water utilities in Tanzania and requires relevant developers to obtain permits and authorization from</p>

	Acts	Relevant sections
		<p>EWURA for any proposed development. The proposed development includes issue of energy and water use for the construction and operation of the project.</p> <p><i>The Employer intends to utilize energy from TANESCO using the current generators connection, expecting to be connected with national grid that will be used for the railway transmission line and substations.</i></p>
20	The Petroleum Act, 2015	<p>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 in accordance with the provision of this act. Section 8 (1) states that "Prior to the issuance of the license, the applicant must comply with all necessary Environmental requirements as provided for under the Environmental Management Act."</p> <p><i>The project is expected to store in camps and transport petroleum products between camps and sites. The Project shall ensure that appropriate licenses are acquired for the storage of petroleum products and that transport of these products throughout project implementation complies with the requirement of this Act.</i></p>
21	The Tanzania Investment Act, (2002)	<p>The Tanzania Investment Act provides section that define conditions for investing and doing business in Tanzania. Alongside stating incentives for investors, the Act also sets out immigration quotas for foreign workers, conditions for obtaining credit from domestic sources by foreign investors and procedures for technology transfer. Although investors are required to submit environmental status report as part of the bid document to the TIC, the Act itself does not contain any provisions for ensuring that investment activities are undertaken in an environmentally acceptable manner.</p> <p>This project needs to adhere to the provisions of the act and other laws related to the investment and local content in Tanzania.</p>

	Acts	Relevant sections
22	The Industrial and Consumers Chemicals (Management and Control) Act of 2003	<p>The Act provides for among other issues, importation, transportation, storage, use and disposal of chemicals in Tanzania. The contractor is required to obtain certificate from the Chief Government Chemist for importation, storage or disposal of any chemicals (e.g. Asphalt, Lime etc.). Furthermore, Railway Contractor like any other individual dealing with chemical 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. Failure to compliance might lead to revocation of the certificate.</p> <p><i>TRC shall engage with the relevant authority (GCLA) to obtain the relevant certificate and ensure that contractors fully comply with the condition of the certificate and the requirements of this Act; inspected and regularly monitored as provided for under part III and IV of the acts.</i></p>
23	Public Health Act of 2009	<p>This 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".</p> <p><i>The ESIA study has taken into consideration the potential impacts that the Project may have on the public health and the appropriate mitigations have been outlined</i></p>
24	Child Act of 2009 revised in 2019	<p>The primary objective is to protect and preserve all rights of children. This law is related to the SGR project on the issue of child labour and violence against children. Section 12 of the law emphasized harmful employment to a child. The law state that "A person shall not employ or engage a child in any activity that may be harmful to his health, education, mental, physical or moral development".</p> <p>The law emphasized on protecting children against all forms of exploitation and violence and abuse. The law defines child abuse" as means a contravention of the rights of the child which causes physical, moral or emotional harm including beatings, insults,</p>

	Acts	Relevant sections
		discrimination, neglect, sexual abuse and exploitative labour. This is also linked with the SGR project on any issue related to child abuse and protection.
25	Grave Removal Act of 1969	Provides for removal of graves from land required for public purposes.
26	National Museums Act Number 7 of 1980	For conservation, curation and management of movable objects and artifacts in museums.

4.2.4 Regulations and Guidelines

Table 4-3. Applicable Regulations and Guidelines

	Regulation/ Guideline	Description with respect to the Project
1	Environmental Impact Assessment and Audit Regulations No. 349 of 2005 as amended in 2018	<p>The EIA process is described under the Environmental Impact Assessment and Audit Regulations GN No. 349 of 2005 (and amendment GN 474 of 2018) ('the EIA Regulations') promulgated in terms of the EMA Sections 82(1) and 230(2) (h) and (q).</p> <p>The regulations provide the procedures and requirements for undertaking ESIA for various types of development projects with significant environmental impacts. In addition, the Regulations provide a list of projects that qualify for Environmental Assessment procedures in Tanzania. Regulation 4 Part III classifies projects into four types:</p> <p>Type A Projects requiring a mandatory ESIA; and Type B1- Borderline projects. Type B2 -Projects that are no mandatory and Special Projects category.</p> <p>The EMA guides environmental management and is administrated by the National Environmental Advisory Committee, the Directorate of Environment and the NEMC. This SGR Project falls under Type A projects that requires full ESIA. At the end of the ESIA process an environmental certificate is issued by the Minister responsible for environment.</p>

	Regulation/ Guideline	Description with respect to the Project
2.	The Environmental Management (Registration and Practice of Environmental Experts) Regulations, 2021	<p>These Regulations make provision with respect to Environmental Experts and establish the Environmental Expert Committee. The regulation has gone further to categories experts with respect to their expertise and experience.</p> <p>The SGR lot project being a special Type A project, requiring mandatory ESIA needed registered experts with experience to undertake the ESIA</p>
3	The Environmental Management (Hazardous Waste Control and Management) Regulations, 2021	<p>The Regulations for control of all categories of hazardous waste, covering the generation, collection, storage, transportation, treatment, recycling, reuse, recovery and disposal; and their movements in, into and out of Mainland Tanzania.</p> <p>The SGR activities have potential to generate hazardous waste at the garage and workshops. The contractor will be obliged to adhere to the requirements of this regulation in management of generated hazardous waste. These regulations and the World Bank Group Environmental, Health, Safety Guidelines for Railways, April 2007, World Bank Group Environmental, Health and Safety (EHS) Guidelines, April 2007</p>
4	The Environmental Management (Control and Management of Electrical and Electronic Equipment Waste) Regulations, 2021	<p>The applies to all categories of electrical and electronic equipment wastes with respect to generation, collection, storage, transportation, importation, exportation, distribution, selling, purchasing, recycling, refurbishing, assembling, dismantling and disposal of electrical and electronic equipment waste or components, and their movement into or outside Mainland Tanzania.</p> <p>Several activities in SGR implementation have the potential to generate Electrical and electronic equipment wastes. The contractor will be obliged to adhere to the requirements of the regulation in their management together with the World Bank Group Environmental, Health, Safety Guidelines for Railways, April 2007, World Bank Group Environmental, Health and Safety (EHS) Guidelines, April 2007t.</p>
5	The Environmental Management	The objective of the Regulations is to impose a total ban on the import, export, manufacturing, sale, and

	Regulation/ Guideline	Description with respect to the Project
	(Prohibition of Plastic Carrier Bags) Regulation,2022	use of plastic carrier bags regardless of their thickness. The SGR contractors and subcontractor shall restrain from use of the banned plastic carrier bags. TRC management shall also impose restriction on the use of banned plastic bags during the SGR operation.
6	The Tanzania 2025 Development Vision	<p>A Tanzanian who is born today will be fully grown up, will have joined the working population and will probably be a young parent by the year 2025. Similarly, a Tanzanian who has just joined the labour force will be preparing to retire by the year 2025. What kind of society will have been created by such Tanzanians in the year 2025? What is envisioned is that the society these Tanzanians will be living in by then will be a substantially developed one with a high-quality livelihood. Abject poverty will be a thing of the past. In other words, it is envisioned that Tanzanians will have graduated from a least developed country to a middle-income country by the year 2025 with a high level of human development.</p> <p>The economy will have been transformed from a low productivity agricultural economy to a semi-industrialized one led by modernized and highly productive agricultural activities which are effectively integrated and buttressed by supportive industrial and service activities in the rural and urban areas. A solid foundation for a competitive and dynamic economy with high productivity will have been laid. Consistent with this vision, Tanzania of 2025 should be a nation imbued with five main attributes.</p> <p>High quality livelihood.</p> <p>Peace, stability, and unity.</p> <p>Good governance,</p> <p>A well-educated and learning society; and</p> <p>A competitive economy capable of producing sustainable growth and shared benefits.</p>
7	The Land (Compensation Claims) Regulations 2001	The Land Regulations 2001 were promulgated in terms of the Land Act, Act No. 4 of 1999 sections 12 & 179. The form of compensation is stipulated in Section 10(1) of the Land Regulations 2001. Furthermore, the Regulations list the entities that are eligible for

	Regulation/ Guideline	Description with respect to the Project
		compensation and/or resettlement. If the person does not agree with the amount or method of payment or is dissatisfied with the time taken to pay compensation, he /she may apply to the High Court. The High Court shall determine the amount and method of payment and determine any additional costs for inconveniences incurred. The proponent will comply with this Act throughout the project lifetime.
8	The 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 the 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. Offences 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 vehicles into the air are also given. All these tolerance limits will be complied with during mobilisation, construction as well as operations of the SGR
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 usage 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

	Regulation/ Guideline	Description with respect to the Project
		<p>Committee of 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 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.</p> <p>The regulations give NEMC the power to designate main water polluting activities for which prior grant of permit must be obtain 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.</p>
10	The Environmental (Solid Waste Management) Regulations, 2009 as amended in 2016	The regulation has been made under section 114, 115, 116, 117, 118, 119, 120, 121, 122 and 230 of Environmental Management Act, 2004. These regulations apply to all matter pertaining to solid waste generation and management. They aim at among other things, setting standard for permit to dispose solid waste and license to own or operate solid waste disposal site. The SGR Uvinza to Kigadye project is likely going to generate significant amount of solid waste and its management must comply with these regulations.
11	The Environmental Management Regulations (Hazardous Waste Control), 2021	<p>These regulations have been made under Regulations 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 from generation, 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 following principles of environment and sustainable development:</p> <ul style="list-style-type: none"> • The precautionary principle • Polluter pays principle, and

	Regulation/ Guideline	Description with respect to the Project
		<ul style="list-style-type: none"> • The producer extended responsibility. • Hazardous waste such as petrochemicals, metals etc are likely to be generated from the SGR Project works and these must be managed as these
12	Environmental Management (Soil Quality Standards) Regulations (2007)	<p>These Regulations require the project proponent:</p> <p>To comply with soil quality standards that may be prescribed by the National Environmental Standards Committee (Part II, Section 5).</p> <p>To abstain from polluting soils (Part III, Section 15)</p> <p>To abstain from discharging hazardous, waste, materials, and chemicals on soils (Part III, Section 16)</p>
13	Environmental management (Quality Standards for Control of Noise and Vibration Pollution) Regulations (2011)	<p>These Regulations require the project proponent to:</p> <p>Make or cause to be made any loud, unreasonable, unnecessary, or unusual noise that annoys, disturbs, injures, or endangers the comfort, repose, health, or safety of others and that of the environment (Part III, Section 6).</p> <p>Use the best practicable means to ensure that the emission of noise from that machinery, facility or premises does not exceed the permissible noise levels as specified in Schedule 1 (Part V, Section 8).</p>
14	The Petroleum (waste oils recycling operations) rule, 2017	<p>The rule applies to the regulation of activities related to petroleum waste oils recycling operation and related issues in Tanzania.</p> <p>The SGR project is expected to produce several types of petroleum wastes. The contractor shall require the service of licensed agent under this rule.</p>
15	The Railways (Safety Standards of Infrastructure and Rolling Stock) Regulations, 2018	<p>The Regulations require TRC to develop, implement and maintain safety standards in relation to infrastructure.</p> <p>The width of formation level be in such that can maintain the function of the track, taking into consideration the gauge, track structure, permanent way appurtenance, maintenance work and other factors, and meet among others the following criteria-</p> <p>a) brake system; b) system protecting rolling stock from colliding or minimizing the impact of a collision; c) fire protection or control system; d) anything that</p>

	Regulation/ Guideline	Description with respect to the Project
		affects the control movement of rolling stock such as windscreen wipers and demisters, lights and anti-glare equipment

4.2.5 The Institutional Framework

The proposed Railway line is a linear project touching the interest of several, institutions and administrative framework as discussed here below.

- ***Institutional and Administrative Framework in Tanzania***

The project touches the interest of three districts namely Uvinza, Kasulu and Buhigwe as well Kasulu Town Council in Kigoma Region Tanzania. Therefore, the project falls under the jurisdictions of ***The Local Government Authorities*** for administrative purposes. The Local Government Authorities include the Municipal Councils, District Councils, Town Councils, Townships 'Kitongoji', Ward 'Mtaa' and Village which will be responsible to ensure that the interests of local communities are considered, including compensation of affected people, protection from environmental pollution as well as resolving conflicts relating to project implementation.

Since the proposed development is about railway development its administrative framework falls under the ***Ministry of Works and Transport*** that will be responsible for coordinating the proposed railway line through TRC. The responsibilities of the Ministry are devolved to the ***Land Transport Regulatory Authority (LATRA)***.

- ***The Land Transport Regulatory Authority (LATRA)***

LATRA was established under section 4 subsection (1) of the Land Transport Regulatory Authority Act of 2018 which state that *There is established a body to be known as the Land Transport Regulatory Authority or in its acronym "LATRA". LATRA responsibilities with respect to this project will include:*

- a). Promoting effective competition and economic efficiency of regulated sectors.
- b). Promoting safety of regulated sectors.
- c). Protecting the interests of consumers in relation to costs, quality, and standards of transport services.
- d). Protecting the financial viability of efficient suppliers.
- e). Promoting the availability of regulated services to all consumers including low income, rural and disadvantaged consumers; and
- f). Considering the need to protect and preserve the environment.

- ***Sector Ministries***

Under the existing institutional and legal framework, the sector ministries are required to establish Sector Environmental Sections headed by the Sector Environmental Coordinator. The Sector Ministries Environmental Sections are responsible for co-ordination of the environmental management activities in the sector including: -

- (a) ensuring environmental compliance by the Sector Ministry.
- (b) ensuring all environmental matters contained in other sector ministries are implemented.
- (c) evaluating existing and proposed policies and legislation and recommend measures to ensure that those policies and legislation take adequate account of effect on the environment.
- (d) promoting the public awareness of environmental issues through educational programmes and dissemination of information.
- (e) undertaking analysis of environmental impact of sectoral legislation, regulation, policies, plans, strategies and programmes through strategic environmental assessment (SEA); and
- (f) overseeing the preparation of and implementation of EIA required for investments in the sector.

- ***The Regional Secretariat***

The Regional Environmental Management Expert within the Regional Administrative Secretary office is responsible for co-ordination of all environmental management in their respective regions. The Regional Environmental Expert is responsible for: -

- (a) advising the local authorities on matters relating to the implementation of and enforcement of by-laws and Acts; and
- (b) creating a link between the region and the Division of Environment and the National Environmental Management Council.

- ***The National Environmental Management Council (NEMC)***

The EMA (2004) empowers NEMC to manage the EIA process which includes screening and approval of ESIA reports. After approving the ESIA reports, EMA (2004) requires NEMC through the Minister responsible for Environment to issue an Environmental Certificate. Therefore, the EIA process for the proposed Uvinza – Kigadye railway project will be managed by the same institution.

Other institutions whose administrative decisions will be relevant to the proposed development include the Ministry of Land and Human Settlement for land issues, the Ministry of Water for water related issues, Tanzania Forest Agency Services under the Ministry of Natural Resources and Tourism (Forestry Division) will be responsible for issues related to the loss of forest and forest products. This ESIA addresses the administrative set up and the extent the project has fostered co-ordination among key decision makers and actors.

4.3 Project Implementation Entity – Roles and Responsibilities

4.3.1 Introduction

A clear and well-structured implementation arrangement is a prerequisite for the success of the project in achieving its desired objectives. This section described role and responsibilities for the Project Implementation Entity (PIE) for the Uvinza-Kigadye SGR. It also outlines institutional and legal framework for the implementation of the project (with focus on PIE), implementation agencies and other stakeholders, legislative and regulatory requirements for the implementation of the Environmental and Social Management Plan (ESMP).

4.3.2 The Project Implementation Entity (PIE)

Tanzania Railways Corporation (TRC) is the main PIE with overall responsibility for ensuring that the Project is fully implemented by taking into account Employer's Requirements (i.e., TRC) as well as national and the Lenders' requirements and standards (i.e., in this Uvinza-Kigadye SGR, the lender is the African Development Bank-, AfDB) as well as other applicable international conventions and standards for railway construction.

TRC is mandated to implement railway construction and operation in Tanzania through the Railway Act, 2017 that created TRC and guides the development, maintenance and promotion of the railway infrastructure, rail transport services and related matters. The Act give powers to TRC to build railway infrastructure and superstructure, acquire, hold, and alienate movable and immovable properties and operate a railway system by making sure it is safe, maintained and sustainable.

- **Director General:** The DG is the overall in charge for management of TRC and all its activities. He is the accounting officer answerable for everything that happens or is planned for TRC. Thus, to be able to manage, these responsibilities the TRC has structured itself to provide key personnel at managerial level who are responsible for day-to-day operation. Most of the development programmes are under the Directorate of Commercial Investments (DCI) who reports to the Director General.
- **The DCI:** For the Uvinza - Kigadye SGR, the DCI will lead the project implementation. He will be assisted by a Project Manager and Deputy Project Manager.
- **Key Directorates:** Given the nature of the project, other key personnel such as the Director of Legal Services, Director of Human Resources and the Director of Planning, Finance and Administration will be part of the PIE.
- **Manager for Environment and Social:** This Manager deals with all matters related to environmental and social compliance both for national and for the lenders.

- **Consultant:** Drawing from other SGR projects, TRC is represented at the project level by a Project Consultant. Currently, there has not been any one that has been appointed but there will be a Project Consultant, who represent TRC at the project implementation and make technical reviews and suggestion, including approving invoices from the contractor on behalf of TRC.
- **Contractor:** He is responsible for timely and efficient construction of the project in accordance with directives and specification provided, approved and agreed by TRC. He is also responsible for procuring materials, equipment and sub-contractors for the various works.

4.3.3 Institutional and Legal Framework

Roles and responsibilities for the PIE (TRC) for the Uvinza-Kigadye SGR project are provided in the Railway Act 2017. The institutional arrangement is relatively as described above, the DG being the key decision maker and overall, in charge of the operations within TRC.

TRC operations are governed by the Railway Act 2017 but also, they must comply with all other national laws and conventions that Tanzania has ratified. Therefore, the list of policies and laws described in Chapter 3 of this ESIA report are relevant to this SGR Project. TRC is required to ensure that the contractor and his sub-contractors all comply with the policies, laws and standards adopted for this SGR project.

4.3.4 Regulatory Framework for Implementation of ESMP

The Environmental Management Act (EMA) 2004 and the Environmental Management (Environmental Impact Assessment and Audit) (Amendment) Regulations (2018), directs that no development activity shall be allowed to proceed without obtaining an environmental certificate from the Minister responsible for Union and the Environment in the Vice President's Office of United Republic of Tanzania. This requirement demand that developers must carry out Environmental Impact Assessment for the proposed project and submit to National Environment Management Council (NEMC), a report that will be reviewed and once approved, a certificate will be issued to the developer (in this case TRC).

The Act and the regulations require the preparation of the ESMP that will guide management of identified risks and impacts and a monitoring programme that will continuously check the effectiveness of the measures given in the ESMP. The law also states that resource must be set aside to ensure the ESMP is implemented.

The implementation of the ESMP falls under the developer – namely in this case, TRC with roles subdivided between him and the contractor depending on the impacts identified. To facilitate this process, the Contractor prepares a Contractor ESMP that will guide his activities in the implementation of the ESMP and reports to the TRC and /or the Lenders as the case may be.

The NEMC is mandated to ensure compliance with the implementation of ESMP by receiving from TRC implementation status reports annually as well to conduct compliance monitoring, to inspect whether the developer (TRC) complies with directives

provided in the certificates and all other national and international conventions that Tanzania has ratified.

The implementation of the ESMP may also involve other agencies and stakeholders depending on issues at stake. For example, there could be need to carry Biodiversity Action Plan monitoring that may require special skills from competent entities such as research /training institutions. Monitoring of some parameters such as noise, air quality, vibration, health related issue etc may be done by other agencies rather than TRC.

Implementation of the ESM may also involve communities especially through compliance monitoring where communities may be asked to comment on whether the project is adhering to prescribed protocols. This sort of engagement however, will depend on whether the community members and other stakeholders were fully involved in the ESIA process and the report were disclosed to them so that they know what the TRC and the contractor is expected to do. Extensive sensitization and awareness raising and information sharing will fill this gap and enable other stakeholder be active participants in the implementation of the ESMP.

4.4 International Policies and Guidelines

4.4.1 The African Development Bank Requirements

African Development Bank Group's Integrated Safeguards System: Policy Statement and Operational Safeguards, 2013

The environmental and social safeguards of the African Development Bank (AfDB) are a cornerstone of the Bank's support for inclusive economic growth and environmental sustainability in Africa. As the Bank adapts to emerging environmental and social development challenges, safeguards can quickly become out of date. The Bank has developed an Integrated Safeguards System (ISS) order to articulate its safeguard policies while improving their clarity, coherence and consistency. The ISS builds on a variety of previous policies and safeguards. The ISS brings these policies and strategies into a consolidated framework that is intended to enhance the effectiveness and relevance of the Bank's work. The ISS contains of four interrelated components that include:

- **The Integrated Safeguards Policy Statement** – It describes common objectives of the Bank's safeguards and lays out policy principles. It is designed to be applied to current and future lending modalities, and it takes into account the various capacities and needs of regional member countries in both the public and private sectors.
- **Operational Safeguards (OSs)** – are a set of five safeguard requirements that Bank clients are expected to meet when addressing social and environmental impacts and risks.

- **Environmental and Social Assessment Procedures (ESAPs)** – This provides guidance on the specific procedures that the Bank and its borrowers or clients should follow to ensure that Bank operations meet the requirements of the OSs at each stage of the Bank’s project cycle.
- **Integrated Environmental and Social Impact Assessment (IESIA)** – These Guidance Notes provide technical guidance to the Bank’s borrowers or clients on standards on sector issues, such as roads and railways, hydropower, or fisheries, or on methodological approaches clients or borrowers are expected to adopt to meet OS standards.

The AfDB’s Operational Safeguards include the following:

Operational Safeguard 1: Environmental and social assessment – This overarching safeguard governs the process of determining a project’s environmental and social category and the resulting environmental and social assessment requirements.

Operational Safeguard 2: Involuntary resettlement land acquisition, population displacement and compensation – This safeguard consolidates the policy commitments and requirements set out in the Bank’s policy on involuntary resettlement, and incorporates a number of refinements designed to improve the operational effectiveness of those requirements.

Operational Safeguard 3: Biodiversity and ecosystem services – This safeguard aims to conserve biological diversity and promote the sustainable use of natural resources. It also translates the commitments in the Bank’s policy on integrated water resources management into operational requirements.

Operational Safeguard 4: Pollution prevention and control, hazardous materials and resource efficiency – This safeguard covers the range of key impacts of pollution, waste, and hazardous materials for which there are agreed international conventions, as well as comprehensive industry-specific and regional standards, including greenhouse gas accounting, that other multilateral development banks follow.

Operational Safeguard 5: Labor conditions, health and safety – This safeguard establishes the Bank’s requirements for its borrowers or clients concerning workers’ conditions, rights and protection from abuse or exploitation. It also ensures greater harmonization with most other multilateral development banks (AfDB,2013)

- ***The AfDB Group's Handbook on Stakeholder Consultation and Participation, 2001***

The Handbook provides guidelines and outlines specific actions that AfDB staff should take to promote participation at every stage of the AfDB's project cycle, including the preparation of Country Strategy Papers, and Poverty Reduction Strategies. The Handbook explains the concept of stakeholder participation, including a description of different levels of participation, its benefits and risks, and underlying principles. It provides an overview of some of the most frequently used participatory methods, tools, and techniques and explores some key institutional and resource implications related to mainstreaming participatory approaches in the AfDB's work. It also identifies current constraints and recommends specific steps that can be taken to translate the AfDB's policy commitment to participation into action. Finally, the Annexes provide advice on where staff can go for further information on participation, including references for written materials, relevant websites and a variety of African and international institutions with such expertise.

The ESIA process involved public and stakeholder consultations in all the districts that the proposed Project will traverse. The outcomes of these consultations are as presented in this report. Further and better particulars on stakeholders' engagement can be found in part 5 of this report.

4.4.2 Relevant International Conventions and Treaties

Tanzania has signed and ratified several international conventions and treaties that commit the country to conservation and protection of biological and environmental resources respectively.

Herein follows a review of the international conventions and treaties that are relevant to this proposed Project which must be complied with and adhered to during its implementation and management.

4.4.3 African Charter on Human and Peoples Right

The African Charter on Human and Peoples' Rights (also known as the Banjul Charter) is an international human rights instrument that is intended to promote and protect human rights and basic freedoms in the African continent. The Charter consider that 'the freedom, equality, justice and dignity are essential objectives for the achievement of the legitimate aspirations of the African people'.

The Charter recognizes most of what are regarded universally accepted civil and political rights. The civil and political rights recognized in the Charter include the right to freedom from discrimination (Article 2 and 18(3)), equality (Article 3), life and personal integrity (Article 4), dignity (Article 5), freedom from cruel, inhuman or degrading treatment or punishment (Article 5), rights to due process concerning arrest and detention (Article 6), the right to a fair trial (Article 7 and 25), freedom of religion (Article 8), freedom of information and expression (Article 9), freedom of association (Article 10), freedom of assembly (Article 11), freedom of move

The Charter also recognizes certain economic, social and cultural rights, and overall, the Charter is considered to place considerable emphasis on these rights. The Charter recognizes right to work (Article 15), the right to health (Article 16), and the right to education (Article 17). The Charter is also understood to include a right to housing and a right to food as “implicit” in the Charter, particularly considering its provisions on the right to life (Art. 4), right to health (Art. 16) and to development (Art. 22). Thus, the Railway line project should consider Human right issues.

a). The Convention on Wetlands of International Importance (RAMSAR Convention), 1971

The Ramsar Convention provides a framework for national action and international co-operation for the conservation and wise use of wetlands and restrains member countries from unsustainable use of their wetland resources.

The RAMSAR Convention encourages contracting parties to: -

- i. develop management plans and to establish appropriate legal and administrative structures for the application of management plan; and
- ii. examine the possibility of establishing appropriate wetland restoration projects.

In Tanzania, the major wetlands include lakes, rivers, marshes (fresh water) and swamps, estuaries delta (without mangroves), floodplains, mangroves, open coasts and Man-made wetlands delta (without mangroves).

The proposed Project of railway line traverses through and impact the areas with most noticeable rivers, wetlands, and floods such as: - impacting the wetland area at Nyamgongo flood plain at Asante Nyerere village and interfering with Malagarasi flood plain.

The most fundamental characteristic of the above-mentioned area is that they are a source of water, and they sustain characteristic biota or living organisms. Therefore, the prevention, minimization or mitigation measures have been proposed in this EIA study to ensure those wetlands are not affected by the proposed Project during implementation.

b).The UNESCO Convention for the Protection of the World Cultural and Natural Heritage, (World Heritage Convention) 1972

This Convention aims to encourage the identification, protection, and preservation of earth's cultural and natural heritage. It recognizes that nature and culture are complementary, and that cultural identity is strongly related to the natural environment in which it develops.

The Convention provides for the protection of those cultural and natural 'properties' deemed to be of greatest value to humanity. It is not intended to protect all properties of great interest, importance, or value, but rather a select list of the most outstanding of these from an international viewpoint.

In the course of implementing this Project, cultural and heritage sites may be discovered. Recommendations will be made according to Tanzanian legislation and policies and international best practices on handling these sites.

c).The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention or CMS), 1980

This Convention covers the protection of migratory species and their habitats and is the only global convention established exclusively for the conservation and management of migratory species. It is also concerned with wild animals that migrate across or outside national jurisdictional boundaries.

There were no specific migratory species identified in the project area; however, it was mentioned by stakeholders that chimpanzee do migrate through the project area. This Convention should therefore be considered in the course of the Project implementation, and where applicable, best practices should be followed on the safe and appropriate handling of migratory species of wild animals.

d).The Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), 1979

This Convention seeks to control the trade in species of wild animals and plants that are, or may be, threatened with extinction as a result of international trade. CITES is an important line of defense against the threat posed to diversity by invasive species.

Initial activities of the proposed Project will include identification of species in the project area, to avoid introduction of harmful alien species during landscaping and re-vegetation.

e).The African Convention on the Conservation of Nature and Natural Resources, 1968

The fundamental principle of this Convention requires contracting states to adopt the measures necessary to ensure conservation, utilization and development of soil, water, flora and fauna resources in accordance with scientific principles and with due regard to the best interests of the people. The contracting states are also required to take effective measures for the conservation and utilization of soil, water, floral and faunal resources. Protected species should be accorded special protection, including the maintenance of habitats necessary for their survival. In the Convention is included 2 lists of protected species, Class A and Class B.

The proposed Project on construction of railway line traverses forest reserves and water bodies such as Mkuti forest Reserves in Uvinza District and Malagarasi River and flood plain. Therefore, this Convention should be considered while implementing the Project, and where applicable, best practices should be followed on the safe and appropriate handling of soil, water flora and fauna resources.

CHAPTER FIVE

5 BASELINE CONDITIONS OF THE STUDY AREA

The development of baseline characteristics is a critical component of the planning and implementation processes. It serves as a key benchmark against which program performance and positive and negative impacts on the environment, people, and communities can be assessed over the course of the project through periodic monitoring and evaluation. As a result, it is an important component of the environmental and social impact assessment. The baseline study for Tanzania's proposed railway line from Uvinza to Kigadye has been completed for all potentially impacted areas, particularly those areas and communities that are likely to be positively and negatively influenced, directly or indirectly, by the project.

5.1 Physical environment

5.1.1 Geology and climatic conditions

The proposed railway line project from Uvinza to Kigadye in Tanzania side to Burundi boarder traverses varying topographical, geographical and soil, climatic, hydrological and vegetation as well as environmental characteristics. The classifications of these environmental characteristics are discussed on broad bases covering the regional to district levels highlighting the most unique critical features.

a). Topographic Features

The Kigoma region is a gently inclined plateau with steep hills rising sharply from 800 meters at Lake Tanganyika's level to 1,750 meters to the east, descending from the north and east into gently rolling hills with three major perennial rivers: Malagarasi, Luiche, and Ruchugi. The major drainage area is comprised of the first two rivers. The rivers descend to river valleys at 1000 meters and a swampy, flat delta area at 800 meters, where they enter Lake Tanganyika.

The railway line primarily runs through the districts of Uvinza, Kasulu, and Buhigwe, as well as Kasulu Town Council. The topography of the Uvinza district is made up of highlands, lowlands, and lakeshores. The western hill strip along the shores of Lake Tanganyika defines the highland altitude, while the eastern and southern lake shores define the lowland altitude. Lowland elevations range from 900 to 1500 meters above sea level. The lakeshore area is located between the Southern Hill Strips and the shores of Lake Tanganyika. Kasulu district is divided into lowlands and highlands at 1,200-1,800 meters above sea level, as well as plateaus at 914-1,300 meters above sea level.

b). Climatic Condition

The Kigoma region has a typical tropical climate, with a long wet rainy season from late October to May and a short dry spell of 2-3 weeks in January or February followed by a prolonged dry season. Annual rainfall varies from 600 mm to 1500 mm, with the

highlands receiving the most, the lower slopes receiving the most, and the valley bottom and lakeshore areas receiving the least. The average daily temperature ranges from 250 degrees Celsius in December and January to 280 degrees Celsius in September. Temperature decreases as altitude increases. The railway line passes through areas with adequate rainfall, ranging from 1,300 mm to 1,500 mm, and temperatures ranging from 16 °C to 29 °C degrees centigrade.

c). Geology and Soil

Geologically the Kigoma region falls under the Manyovu red beds as a regional geological formation that trends North South direction of west part of Tanzania. This area is characterized mainly by sedimentary rocks consisting of Bukoban sandstone, siltstone, phyllites, shales and limestone.

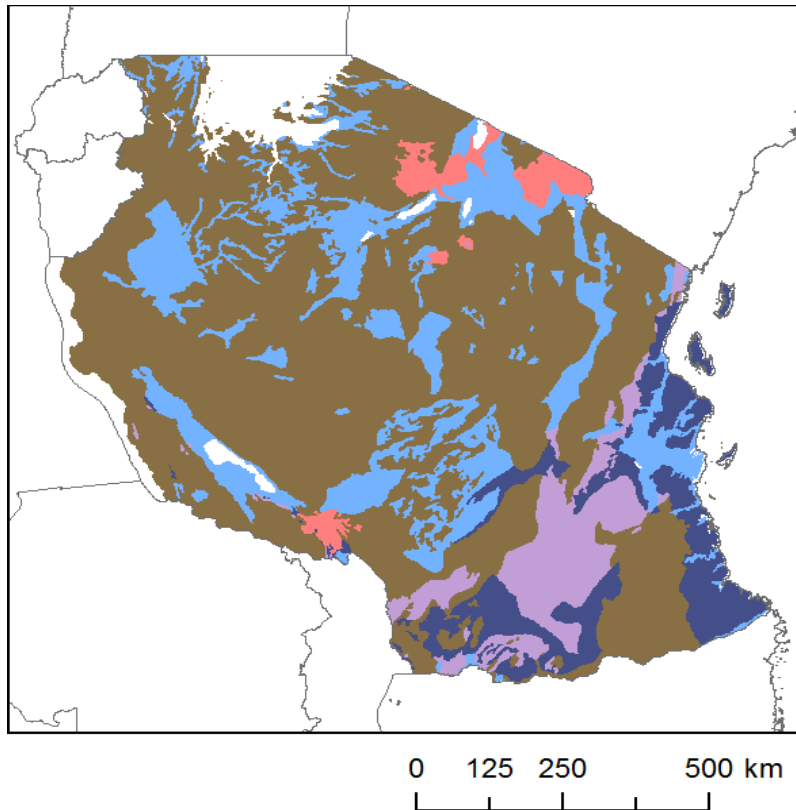
The soils of Kigoma region can generally be categorized as follows: Along the lake shore the soils are deep and well drained comprising the dark reddish brown fine sandy loams, and sandy loams partly stony and severely eroded. The heavy black soils are found in permanently waterlogged areas with black clayey soils which have a high proportion of sand in swamp fringes subject to seasonal water logging. These are highly fertile areas because of high proportion of sand and silt. However, these soils are not subject to seasonal wetting and drying like the cotton soils because the water table is high. In the low relief areas, the soils are dark reddish clay loams with good internal drainage while the black and brown alluvial soils are mostly found in areas of high relief.

5.1.2 Hydrology

Kigoma region encompass three major perennial rivers of Malagarasi, Luiche and Ruchugi. The first two rivers comprise the major drainage area. The descent of these rivers leads to rivers valleys at 1000 metres, and swampy and flat delta areas at 800 metres where the rivers enter Lake Tanganyika. The proposed railway line will interfere with Malagarasi River and part of extensive flood plain.

5.1.2.1 Ground water resources

The main hydrogeological condition in the project area is unconsolidated sedimentary and basement complex as showed in Map 5-1



Tanzania - Aquifer Type and Productivity

- Unconsolidated - Low to High
- Volcanic - Low to Moderate
- Sedimentary Intergranular/Fracture - Low to High
- Sedimentary Intergranular/Fracture - Low to Moderate (sometimes High)
- Basement - Low to Moderate

Map 5-1: Tanzania Aquifer type and productivity

From the Map 5-1, it can be noted the main aquifers along the corridor are basement complex and unconsolidated sedimentary. Groundwater occurrence in Basement Complex rocks is largely limited to secondary permeability, such as weathered zones, joints, fractures, faults, or solution features. The potential of weathered zones depends on the degree and depth of weathering and associated fracturing, and the saturated thickness. The aquifers are generally discontinuous, and often confined. Higher yields are obtained where thick weathered zones are associated with bedrock fracturing. The basement aquifers are typically up to 50 m thick. Recharge generally occurs through fracture zones, faults, or lineaments.

The unconsolidated sedimentary aquifer is mainly alluvial deposits found along river valleys and flood plains. Borehole yields vary depending on lithology. The thickness of unconsolidated aquifers is usually not well defined, but the water table depth tends to vary between 10 and 20 m. Boreholes are often drilled to depths of 100-200 m. Rainfall is the dominant source of recharge, but infiltration also occurs from rivers and lakes

5.1.2.2 Surface water

The Uvinza- Kigadye SGR is within the Lake Tanganyika basin. and Internal Drainage Basin the SGR crosses the Muyowosi and Malagarasi Ramsar Wetlands sites. Apart from the perennial and seasonal rivers, SGR corridor also crosses wetlands and flood plains from Uvinza to Kigadye. Table 5-1 shows the seasonal and perennial rivers crossed by the SGR line

Table 5-1 : Seasonal and perennial rivers crossed by the SGR line

Sno.	Shape	Type	River Name	Northings	Eastings
0	Point	River		9545185	190423
1	Point	River		9543763	192559
2	Point	Stream		9543075	192524
3	Point	Stream		9541777	192257
4	Point	River		9538981	192038
5	Point	Tributary		9536477	191274
6	Point	Stream		9535362	189047
7	Point	Stream		9534478	187589
8	Point	Stream		9532622	188440
9	Point	Stream		9530861	190084
10	Point	Stream		9530266	189619
11	Point	Tributary		9529972	186836
12	Point	Tributary		9530019	186686
13	Point	Stream		9530038	185745
14	Point	Tributary	Mugera	9528683	185173
15	Point	Tributary	Mugera	9527480	185054
16	Point	Tributary	Mugera	9527027	185254
17	Point	River	Nyawigera	9525592	186066
18	Point	Stream		9524097	187834
19	Point	Stream		9522857	188926

Sno.	Shape	Type	River Name	Northings	Eastings
20	Point	River	Mgela	9521433	190009
21	Point	River		9517226	190997
22	Point	Stream		9516406	190616
23	Point	Stream		9515625	190097
24	Point	Stream		9514756	190369
25	Point	Stream		9514200	190726
26	Point	Stream		9513830	191064
27	Point	River	Katchonge	9512229	192149
28	Point	Tributary	Katchonge	9512230	192933
29	Point	River		9511675	193830
30	Point	Tributary		9511644	194592
31	Point	Tributary		9511680	195072
32	Point	Tributary		9511605	195329
33	Point	Tributary		9511227	195526
34	Point	Tributary		9510815	195642
35	Point	Tributary		9510424	195798
36	Point	Tributary		9510176	196001
37	Point	Tributary		9509699	196449
38	Point	Tributary		9509592	196579
39	Point	Tributary		9509545	196742
40	Point	Tributary		9509675	197049
41	Point	Tributary		9509976	197238
42	Point	Tributary		9510148	197488
43	Point	Tributary		9510038	197847
44	Point	Stream		9509495	198212
45	Point	Tributary		9508653	199230
46	Point	Tributary		9508437	199086
47	Point	Stream		9507828	199095
48	Point	Tributary	Kalenge	9507541	198426

Sno.	Shape	Type	River Name	Northings	Eastings
49	Point	Tributary	Kalenge	9507658	198198
50	Point	Tributary	Kalenge	9507657	198019
51	Point	Tributary	Kalenge	9507253	197548
52	Point	Tributary	Kalenge	9507032	197345
53	Point	Tributary	Kalenge	9506814	197268
54	Point	Tributary	Kalenge	9506551	197310
55	Point	Tributary	Kalenge	9506420	197404
56	Point	Tributary	Kalenge	9506088	197565
57	Point	Tributary	Kalenge	9504957	197310
58	Point	Tributary	Kalenge	9504815	197197
59	Point	Tributary		9503939	196410
60	Point	Tributary		9503966	196157
61	Point	Tributary		9503926	195962
62	Point	Tributary	Nyaluseke	9503847	195144
63	Point	Tributary	Nyaluseke	9503850	194679
64	Point	River	Nyaluseke	9503413	193502
65	Point	River	Galaganza	9503042	192965
66	Point	Tributary	Galaganza	9502873	192801
67	Point	Tributary		9501089	192188
68	Point	Tributary		9500677	191770
69	Point	River	Ruhita	9499539	190784
70	Point	River	Hwzi	9496427	185062
71	Point	River	Mgandazi	9490856	183489
72	Point	Tributary	Nyamagonga	9471135	195117
73	Point	Stream		9457949	200768
74	Point	Tributary		9454524	204936
75	Point	Tributary		9453527	205502
76	Point	Tributary		9452492	206076
77	Point	Tributary		9451994	206199

Sno.	Shape	Type	River Name	Northings	Eastings
78	Point	Tributary		9450558	206356
79	Point	Tributary		9450896	206184
80	Point	Tributary		9449711	206655
81	Point	Tributary		9448965	206468
82	Point	Tributary		9447977	206114
83	Point	Tributary		9447703	206023
84	Point	Tributary		9447343	205896
85	Point	Tributary		9446302	205630
86	Point	Tributary		9446016	205579
87	Point	Tributary		9445227	205440
88	Point	Tributary		9445102	205415
89	Point	Tributary		9444246	205413
90	Point	Tributary		9444066	205459
91	Point	Tributary		9443831	205550
92	Point	Stream		9440287	206421

5.1.2.3 Flooding events

There are two basic types of floods: flash floods and the more widespread fluvial or river floods. Flash floods generally cause greater loss of life and river floods generally cause greater loss of property. The main type of flood in the project area is fluvial or river flood which occurs when the water level in a river, lake or stream overflows the banks.

The flood risk areas along the SGR line are localized in different stretches with the most critical area being in the Muyowosi and Malagarasi Ramsar site and wetland.

5.1.2.4 Existing sources of pollutants

Water quality parameters from both surface water and groundwater sources are generally within the recommended standards with the exception of some parameters such as turbidity, phosphates, electrical conductivity and pH.

High concentrations of phosphorus may be attributed to poor agricultural practices and runoff from urban areas and also due to natural processes of the weathering of rocks and erosion. During the field work it was observed there are no industries and chemical dumps in the vicinity of the water sources and therefore the low pH for some sources can be attributed to agricultural practices. High turbidity was also observed in most of the water sources due to soil erosion and sediment transport due anthropogenic activities in the catchment areas. Sediment, nutrients and agrochemicals from the catchments due to anthropogenic activities threatens the human use of the water sources and also affects the aquatic ecosystems.

5.1.3 Noise and Vibration

5.1.3.1 Identification of sensitive receptors for noise and vibration

According to the IFC General EHS Guidelines, a sensitive receptor is defined as any point on the premises or location occupied by persons where extraneous noise and/or vibration is received. Typical examples of such sensitive receptor locations include permanent or seasonal residences, hotels or motels, schools and daycares, hospitals and nursing homes, places of worships, parks and campgrounds.

For this study, the identification and selection of sensitive receptors for noise and vibration along the SGR Uvinza to Kigadye was conducted based national standard TZS 934 (Part I): 2017 (3rd Ed) ISO 1996-1: 2016 and the Environmental Management (Standards for Control of Noise and Vibration Pollutions) Regulations, 2014).

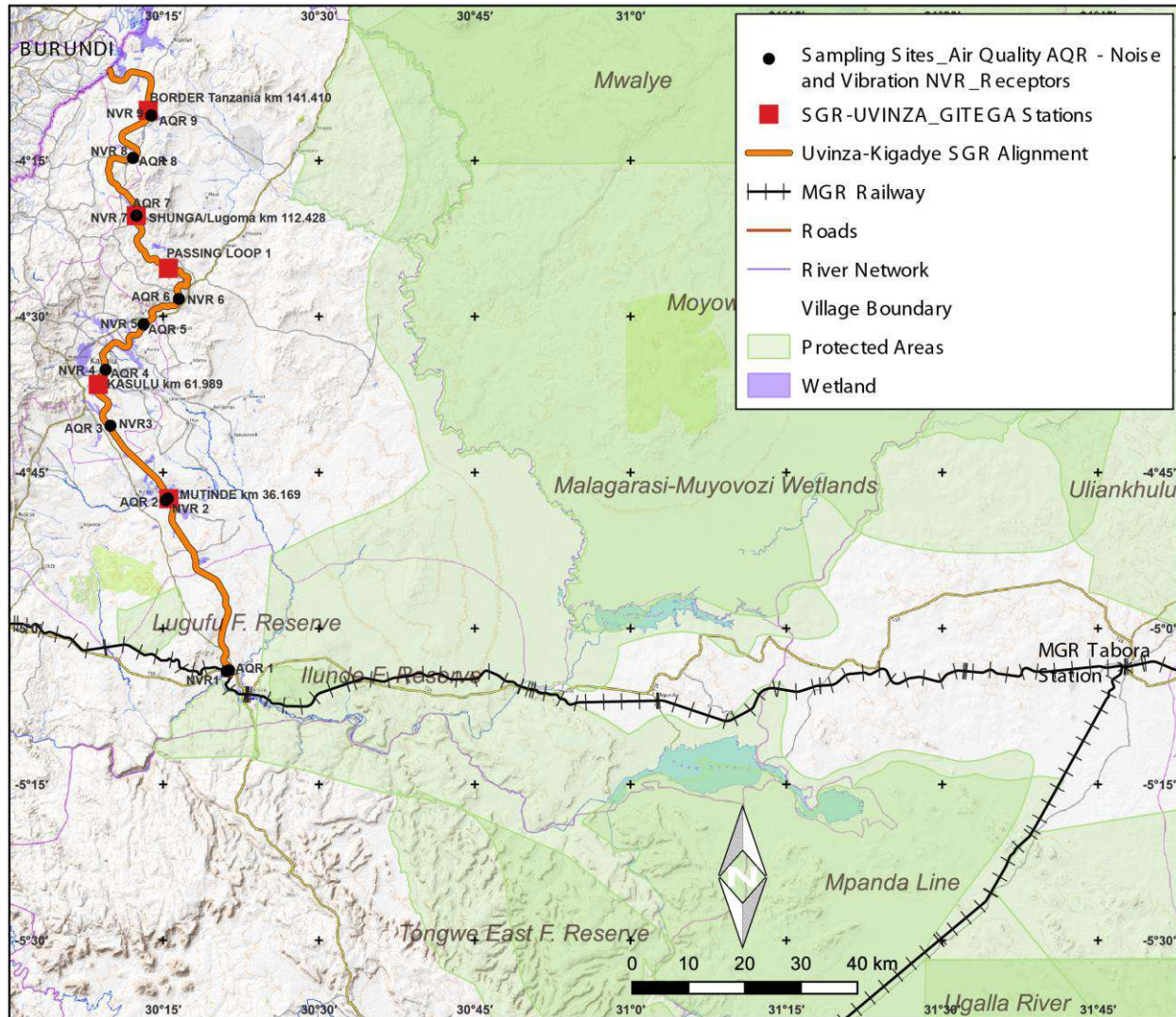
Additional criteria considered for identification and selection of sensitive receptors along SGR lot 5 include:

- i) **Proximity of the receptor to the SGR lot 5 alignment or other project facility:** The selection of sensitive receptors was restricted to a narrow strip on both sides of the alignment of no more than 500 m from the alignment. Some studies have shown that annoyance from railway vibrations is inversely proportional to distance from railway track, with a rapid decrease in vibration disturbance as the distance increases from 25 to 150 metres and a slower rate of reduction over 200 metres, until no vibration disturbance is detected at 500 metres (DUAP, 1997).
- ii) **Affected Community:** Residential, learning institutions, places of worships and commercial areas with significant number of affected people in the proximity of the alignment from Uvinza town to Kigadye village in Kasulu district, Kigoma region were considered to be sensitive receptors for this study;
- iii) **Traceability of the receptor:** Qualified as permanent receptor for future re-assessment and monitoring;
- iv) **Avoidance of intervening row(s) between noise source, sensitive receptor and reflective surfaces:** Receptors were not shielded or blocked by structures such as buildings and the measuring point was located several meters (minimum 3 m) from reflecting surfaces to provide an unbiased indication of the incident sound pressure level;
- v) **Preference:** where two or more receptors appeared to be aligned in a straight line from the proposed alignment and on the same side of the alignment, the most exposed receptor was selected for collection of baseline information.
- vi) **Meteorological conditions** for areas along Uvinza – Kigadye alignment were collected from the Tanzania Meteorological Agency (TMA). The information collected include: wind speed, wind direction, temperature, rainfall and other relevant data. The information was collected for Uvinza, Rungwe Mpya (Mutinde), Kasulu, Nyakitonto and Heru Ushingo.

It has to be noted that Uvinza – Kigadye alignment to a large extent does not traverse through populated areas; hence a total of nine monitoring points were identified along the alignment as shown in Table 5-2 and Map 5-2Map 5-2.

Table 5-2: Location of monitoring points for Noise and Vibration receptors

Code	Village/street name	Ward	Monitoring location	Land use	Chainage (Km+000m)	Distance from Track (m)	Side of the track (LHS/RHS)	Coordinates (UTM 36)	
								Eastings	Nothings
NVR-1	Kibaoni	Uvinza	Kibaoni household	Residential	0+800	45	LHS	206786	9439321
NVR-2	Kaguruka	Rungwe Mpya	Kaguruka Household	Residential	36+300	149	LHS	195771	9469746
NVR-3	Kasyenene	Nyumbigwa	Madandi Secondary School	Learning institution	52+950	315	RHS	185506	9482622
NVR-4	Kigondo	Kigondo	Kigule Primary School	Learning institution	65+210	124	LHS	184625	9492542
NVR-5	Kanazi	Ruhita	Nyakabondo Primary School	Learning institution	79+280	350	LHS	191328	9500624
NVR-6	Nyakitonto	Nyikitonto	Mkesha Baptist Church	Place of worship	88+400	77	RHS	197627	9505146
NVR-7	Shunga	Buhoro	Shunga station	Residential	112+370	65	RHS	190000	9519896
NVR-8	Katundu	Mugera	Mgogo Primary	Learning institution	128+560	10	RHS	189333	9530135
NVR-9	Heru Ushingo	Heru Shingo	Kihenya Secondary School	Learning institution	140+550	460	RHS	192576	9537680



Map 5-2: Location of monitoring points for air quality, noise and vibration

5.1.3.2 Noise Measurement and Data Analysis

A noise meter Lutron SL4033SD was used for measurement of baseline noise level for all sensitive receptors along SGR Uvinza – Kigadye. The device is a class I noise meter and is in compliance international standards for sound level meter specifications IEC 61672:1999, IEC 61260:1995 and IEC61672 Class 1 and provides an automatic or manual recording of actual noise level.

For this study, monitoring of baseline noise conditions was conducted from 14th to 25th June, 2023. Measurement of baseline noise conditions was conducted as per national standard TZS 934 (Part I): 2017 (3rd Ed) ISO 1996-1: 2016. The measurement was conducted at the receiving point. Baseline noise levels were collected during both day-time and night-time. According to Tanzania standard (TZS 932:2017) and the

Environmental Management (*Standards for Control of Noise and Vibration Pollutions*) Regulations, 2014

- daytime starts from **06:00 to 22:00** and
- night-time starts from **22:00 to 06:00**.

According to TZS 932: 2017, measurement duration during day-time should be at-least 4 hours and at-least 2 hours during night-time. Considering the time given for the additional study and effectiveness of the undertaking, day-time noise levels were collected for at least 10 hours between **08:00** and **18:00** and then between **20:00** and **22:00** while night-time noise levels were collected between **22:00** and **01:00**.

During measurement, the noise meter was set to A-weighting scales to enable the meter to respond in the same manner as the human ear. The noise meter was mounted on tripod stands 1.5 m above ground level and set to fast time response for all measurements to capture day-time and night-time noise level readings. Depending on the type of noise sources, noise data acquisition was performed every 1 second or 2 minutes. The noise meter was directed towards the noise source, in this case the SGR Uvinza- Kigadye alignment. During period of this study, locations of quarry sites, borrow pits/dump sites and other project component had not been indicated and could not be assessed. A datalogger was inserted into the noise meter for live acquisition of noise data.

For analysis, energetic noise averaging was done to determine the day-time LAeq (10 h) and night-time LAeq (2 h). The energy average sound level is given by the following expression.

$$L_{Aeq(t,h)} = 10 \log_{10} \left[\frac{1}{N} \sum_{i=1}^N 10^{\frac{L_i}{10}} \right]$$

Where:

LAeq (t, h) = equivalent noise level for the corresponding monitoring period: t = 10 h for day-time and t = 3 h for night-time

Li = instantaneous noise level, and

N = total number of noise data

In addition, the following statistical parameters LA10 and LA90, which show the sound pressure levels that are exceeded for 10% and 90% of the measurement period, respectively were also determined. The LA10 and LA90 were then used to calculate Noise Pollution Level (LPL), Pollution Noise Index (TNI) and Noise Climate (NC) using the following formulae:

- a) $NPL = LA_{eq} + (L_{10} - L_{90})$
- b) $PNI = 4 (L_{10} - L_{90}) + (L_{90} - 30)$
- c) $NC = L_{10} - L_{90}$

5.1.3.3 Vibration measurement and analysis

A vibration meter Lutron BVB-8207SD (Photo 5-1) was used to measure baseline vibration level. The equipment meets ISO 8041-1:2017 performance specifications and tolerance limits for instruments designed to measure vibration values. Measurements were done on the principal axis which is the vertical direction.

The collection of baseline ground vibration was conducted considering Tanzania standard TZS 1471: 2018 (2nd Ed), and FTA - Transit Noise and Vibration Impact Assessment, 2006. The FTA (2006) stipulates that ambient vibration monitoring is generally done in continuous mode to reflect the continuous and intermittent operations during construction and operation phase of the project.

For FTA, the preferred units of vibration measurements are in terms of Root Mean Square (RMS) velocity. FTA (2006) refers RMS velocity to be more appropriate in describing human response than Peak Particle Velocity (PPV). PPV is commonly used in monitoring blasting vibration and its potential to structural damage and is well stipulated in the Environmental Management (*standards for control of Noise and Vibration Pollution*), Regulations 2014. Although FTA (2016) may not require background data on vibration levels in its vibration screening procedures, this study presents the day-time and night-time vibration velocity levels as measured from biaxial sensors in x-axis and y-axis or in y-axis and z-axis. The x- and y-axis criteria is applied if the concern is for people in an upright position while the y- and z-axis criteria is applied if the concern is for people in a lateral position (e.g., asleep at night). This is important in ensuring that the correct frequency weighting is applied to the relevant axis of vibration.



Photo 5-1: Vibration meter Lutron BVB-8207SD and monitoring set-up

5.1.3.4 Observed baseline noise and vibration levels

The baseline noise conditions for SGR Uvinza - Kigadye were analysed and presented according to the degree of noise protection for each category of receptor. These include:

- i) Learning institutions and place of worship (**Degree I of noise protection**)
- ii) Residential area receptors (**Degree II of noise protection**)

i) Noise Receptors at learning institutions and place of worship

The sensitive receptors in this category include: NVR-3 Madandi Secondary School, NVR-4 Kigule Primary School, NVR-5 Nyakabondo Primary school, NVR-6 Mkesha Baptist church, NVR-8 Mgogo Primary School and NVR-9 Kihinya Secondary School. Photo 5-2 shows the area around various learning institution and place of worship monitoring points. These monitoring points fall under stricter standards on noise protection with degree I of noise protection. The monitoring point at Kihinya Secondary School (Photo 5-2d) was located in the proximity of busy road connecting Heru Ushingo and Kigadye village.

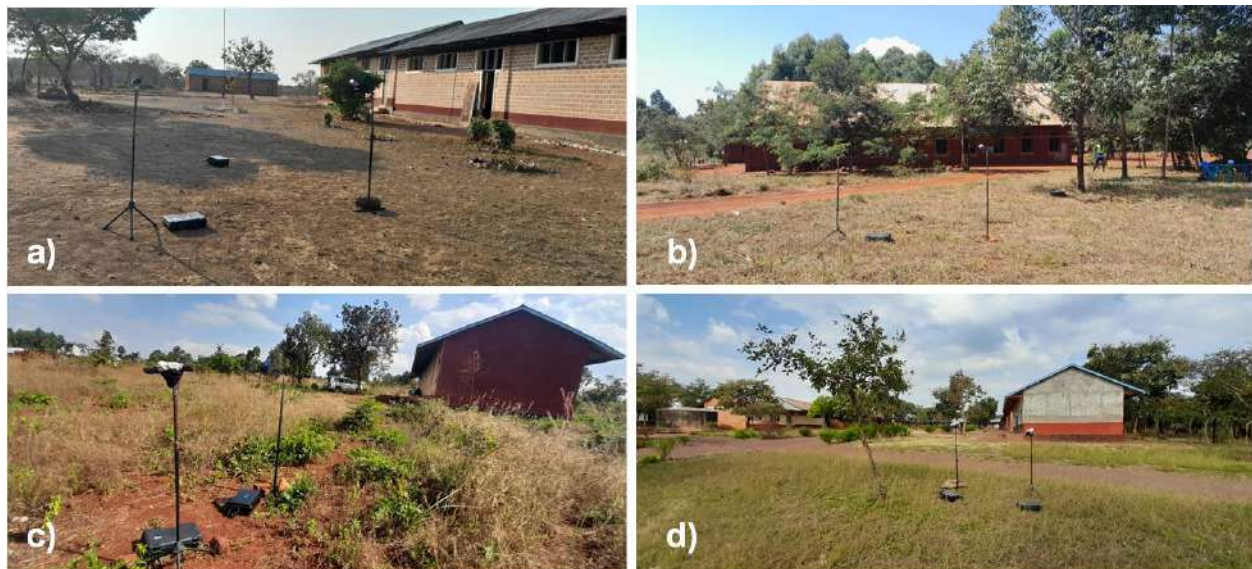


Photo 5-2: Noise Equipment SL4033SD and typical monitoring points

- a) Madandi Secondary School, b) Kigule Primary School, c) Mgogo Primary School (within Way Leave), d) Kihinya Secondary school (in the proximity to the proposed Tanzania Boarder Station)

Typical examples of variation of noise intensity during monitoring period (day-time and night-time) for the learning institutions and place of worship receptors are provided in **Error! Reference source not found.** Figure 5-1 and Figure 5-2. The monitoring period for all receptors was at least 10 hours during day-time and at least 2 hours during night-time.

Figure 5-1 shows variation noise intensity as a function of time NVR-3 Madandi Secondary School with noise level of 32.5 dB(A) exceeded 90% (LA90) during monitoring period, noise level of 43.9 dB(A) exceeded 10% (LA10) during the monitoring period, and energetic average noise level of 42.9 dB(A) for day-time. The night-time statistical noise levels were LA90 of 35.1 dB(A), LA10 of 41.8 dB(A) and energetic average noise level of 39.2 dB(A).

The variation of noise intensity during monitoring period at Kigule Primary School (NVR-4) is provided in Figure 5-2 with LA90 noise level of 33.5 dB(A), LA10 noise level of 44.6 dB(A) and energetic average LAeq (10h) of 41.9 dB(A) for day-time while for night-time statistical values were LA90 noise level of 39.3 dB(A), LA10 noise level of 44.8 dB(A) and energetic average LAeq (2h) of 43.1 dB(A).

According to the URT Environmental Management (Standards for control of Noise and Vibration Pollution) Regulation 2014, learning institutions and place of worship receive **degree I of noise of protection**. This is also echoed in the Tanzania standard **TZS 932: 2017** with permissible noise level of 52 dB(A) during day-time and 42 dB(A) during night-time. Frequently recommended World Bank Group and IFC General EHS Guidelines (section 1.7: Environmental Noise Management) sets the limits at 55 dB(A) during day-time and 45 dB(A) during night-time. In this case Tanzania standard and regulations are more stringent. Generally, the observed energetic average noise levels are in compliance with both Tanzania standard **TZS 932: 2017** and international recognized guidelines such as IFC General EHS Guidelines (section 1.7: Environmental Noise Management).

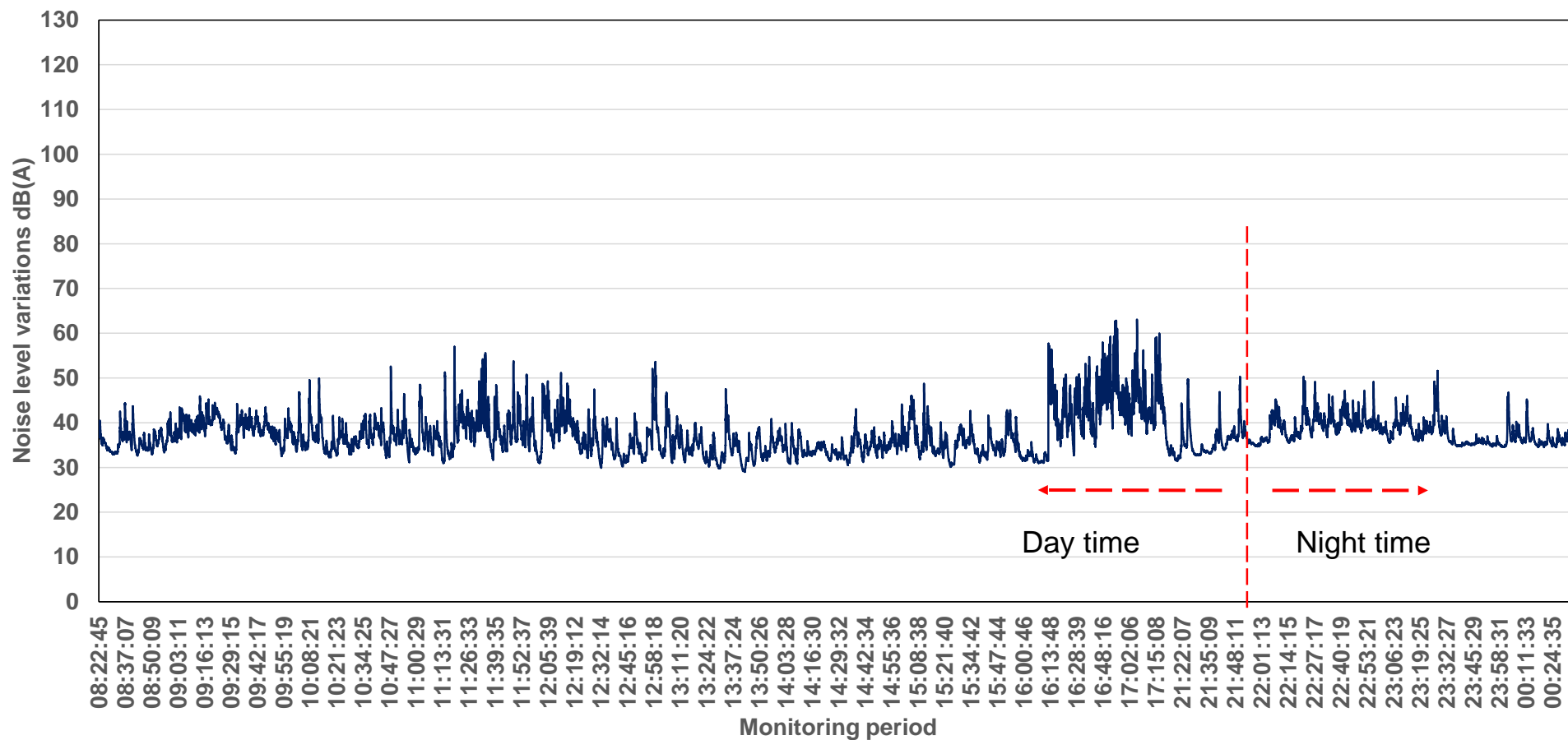


Figure 5-1: Variation of noise intensity during monitoring period at NVR-3 Madandi Secondary School

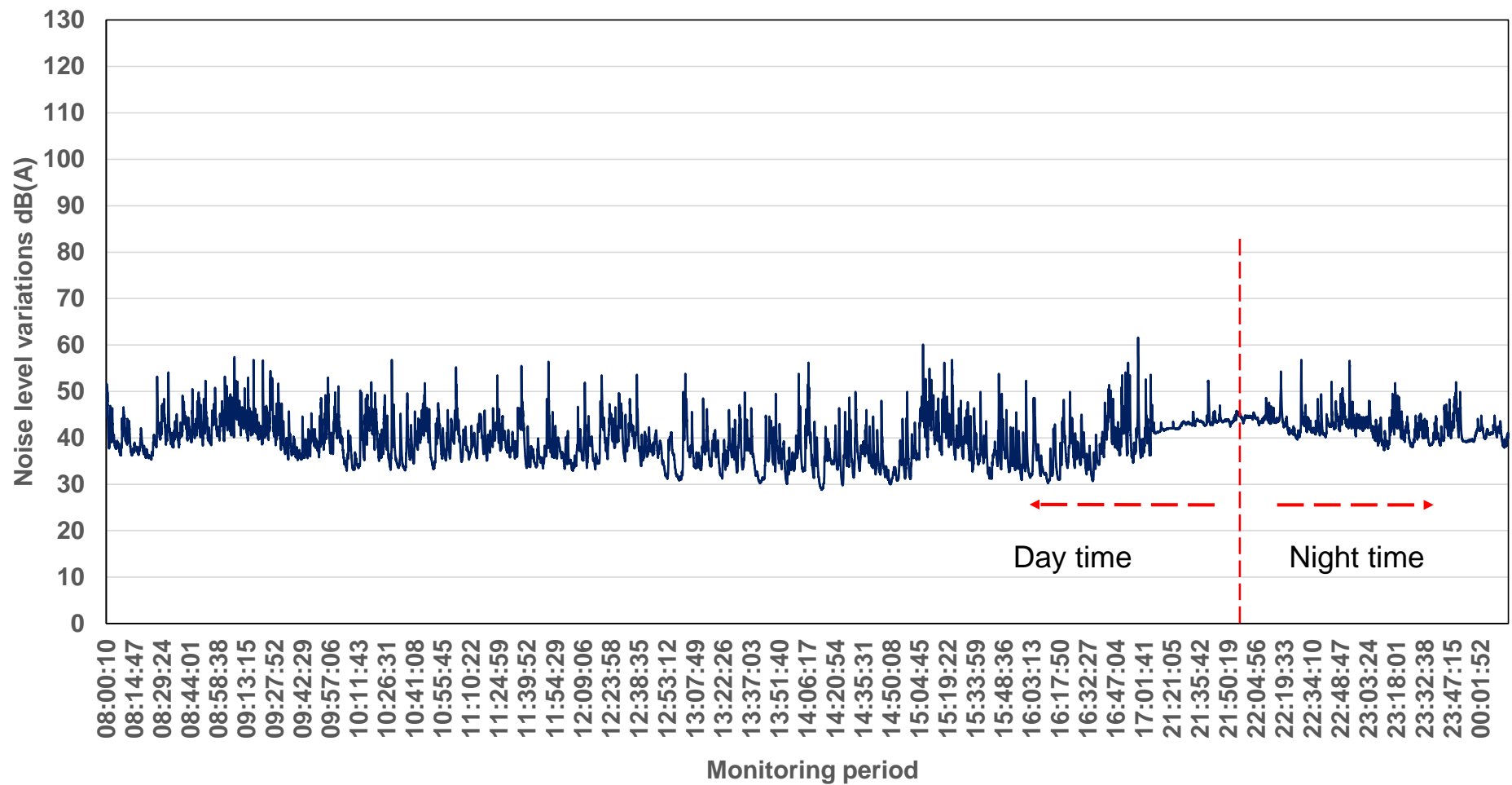


Figure 5-2: Variation of noise intensity during monitoring period at NVR-4 Kigule Primary School

ii) Residential area receptors (Degree II of noise protection)

In this category, sensitive receptors which are essentially residential households are close to the location of alignment from Uvinza to Kigadye. Receptors in this group include NVR-1 Kibaoni household, NVR-2 Kaguruka household (*in proximity to the proposed Mutinde station*) and NVR-7 Shunga household (*in proximity to the proposed Shunga/Lugoma station*). Photo 5-3 shows noise measurement at various residential monitoring points. The residential receptors are within 200 m from the SGR Uvinza – Kigadye alignment.

According to the URT Environmental Management (*Standards for control of noise and vibration Pollution*) Regulations 2014, residential sensitive receptors are classified as areas with **degree II of noise protection**.



Photo 5-3: Noise measurement at residential receptors

a) Kibaoni household; b) Kakurungu household (in proximity to Mutinde station), Shunga household (in proximity to Shunga/Lugoma station)

Typical variation of noise intensity during monitoring period (day-time and night-time) for residential receptors is given in Figure 5-3. The monitoring period for all residential sensitive receptors was at least 10 hours during day-time and at least 2 hours during night-time. The background noise level LA90 exceeded 90% during the monitoring period was 39.0 dB(A), noise level of 49.9 dB(A) exceeded 10% (LA10) during the monitoring period, and energetic average noise level of 47.2 dB(A) for day-time. The night-time statistical noise levels were LA90 of 36.5 dB(A), LA10 of 42.9 dB(A) and energetic average noise level of 41.2 dB(A).

According to the URT Environmental Management (*Standards for control of Noise and Vibration Pollution*) Regulation 2014, residential sensitive receptors receive **degree II of noise of protection** and is echoed in the **TZS 932: 2017**. At NVR-1 Kibaoni residential area both the energetic average noise level during day-time (47.2 dBA) and night-time (41.2 dBA) were in compliance with the Tanzania standard TZS 932: 2017 and international guidelines such as the IFC General EHS Guidelines (Section 1.7: Environmental Noise Management) which set maximum permissible noise levels at 55 dB(A) during day-time and 45 dB(A) during night-time.

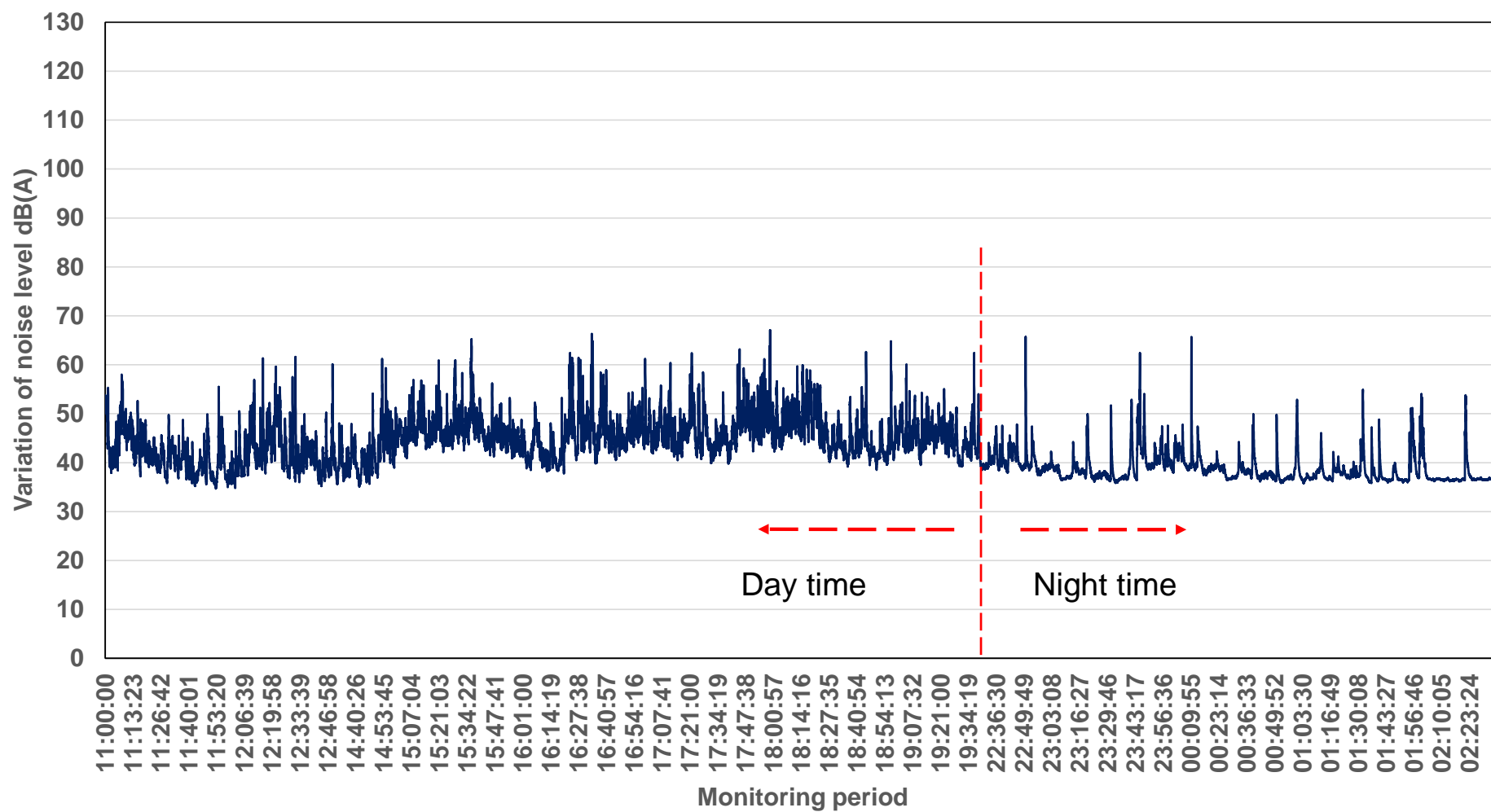


Figure 5-3: Variation of noise intensity during monitoring period at NVR-1 Kibaoni household

iii) Summary of baseline noise levels at various monitoring points

The SGR Uvinza -Kigadye alignment traverses through different current and planned land uses including learning institutions, places of worship, residential areas, road traffic environment, and shrub land. The baseline noise level is therefore influenced by noise from institutions, residential and commercial activities, ongoing road construction activities (Kasulu - Kibondo road), and local road traffic movements. Receptors located in commercial and in proximity to MGR line, ongoing SGR construction activities (borrow pit and quarry site operations) were noted to have higher noise levels.

a) Day-time baseline noise conditions

Figure 5-4 and Table 5-3 present a summary of day-time noise levels at various receptors along SGR Uvinza - Kigadye alignment. The day-time A-weighted equivalent continuous sound energy level (LAeq(10h)) results ranged from 41.9 dB(A) (at NVR-4: Kigule Primary School) to 50.1 dB (A) (at NVR-7: Shunga residential area). At all receptors, the measured baseline noise levels were found to be in compliance with the daytime WHO guidance on health and environment (2022) level of 54 dB(A) and Tanzania standard TZS 932: 2017 maximum permissible noise limit of 52 dB(A) prescribed for learning institutions/places of worship and 55/54 dB(A) prescribed for residential areas.).

Other day-time statistical noise indices measured during this study include LA10 which ranged from 42.5 to 49.9 dB(A); LA90 ranged from 31.4 to 39.0 dB(A); LAmin ranged from 21.3 to 34.7 dB(A) and LAmix ranged 57.0 to 78.0 dB(A) as given in Table 5-3.

The Traffic Noise Index (TNI) which represents the extent of variation in traffic flow. The value of TNI 74 dB(A) is defined as the threshold criterion (*Langdon and Scholes: 1968*). It can be seen from Table 5-3 that TNI is varying in the range of 37.4 to 53.6 dB(A) and all monitoring points exhibited TNI under the threshold limit of 74 dB(A). Also, noise climate (NC) is the range over which the sound levels are fluctuating in an interval of time it varied in the range from 8.3 to 12.2 dB(A). Also, the value of Noise Pollution Level (NPL) varied in the range of 53.0 to 60.8 dB(A).

it should be noted that during the collection of baseline noise data from 14 to 25 June 2023 both private and public school were closed and students were in holiday. This is reflected in the baseline noise level LAeq (10 h) having low values at learning institution receptors.

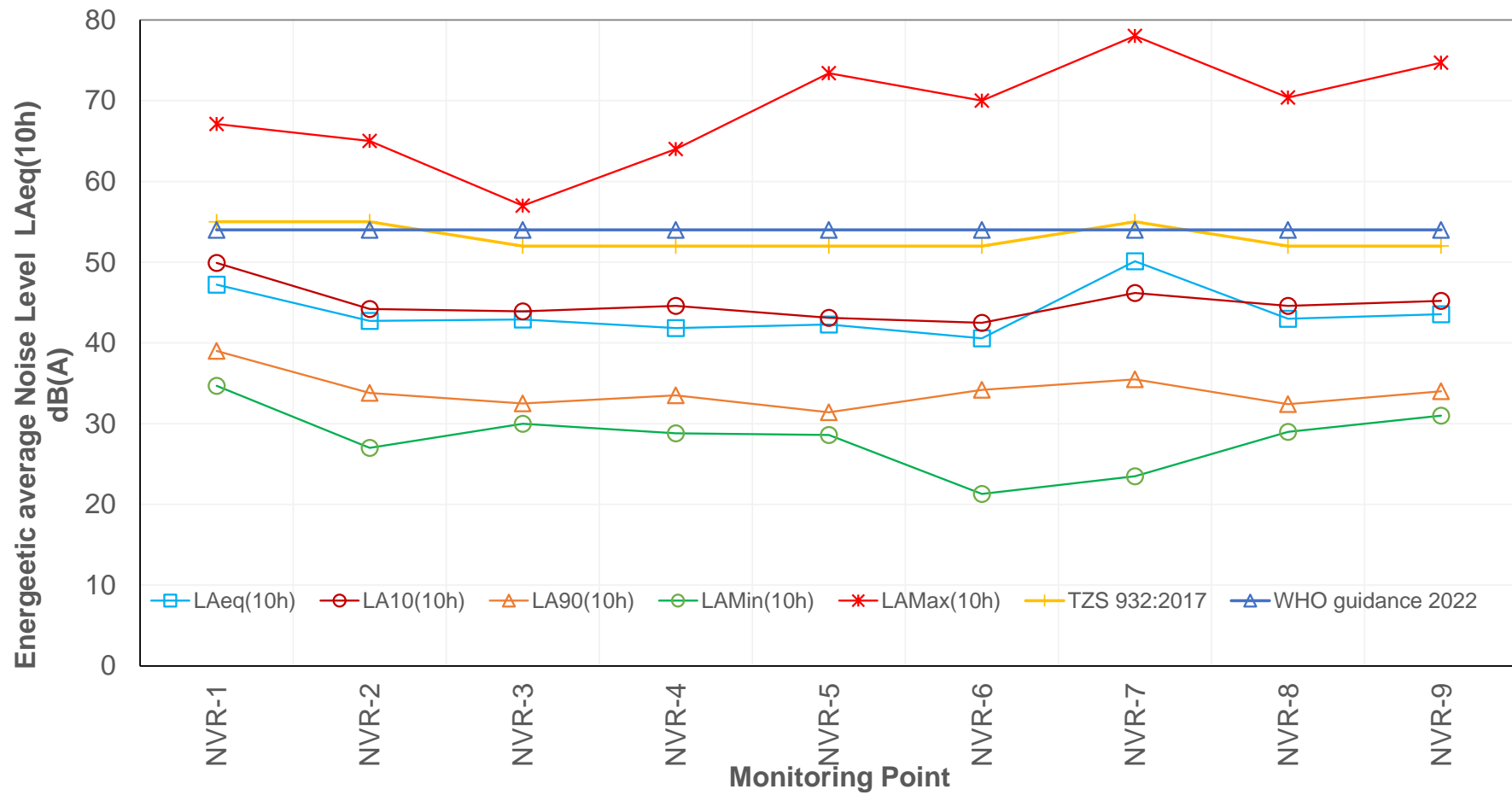


Figure 5-4: Summary of day-time baseline noise levels at various monitoring points

Table 5-3: Summary of day-time baseline noise levels at various monitoring points

Code	Monitoring location	Land use	Chainage (Km+000 m)	Distance from Track (m)	Side of the track (LHS /RHS)	Coordinates (UTM 36)		Energetic average of measured noise levels: dB(A)					Calculated noise levels: dB(A)			TZS 932: 2017	WHO guidance: 2022
						Eastings	Northings	LAeq (10h)	L10	L90	LMin	LMax	NPL	PNI	NC	dB(A)	dB(A)
NVR-1	Kibaoni household	Residential	0+800	45	LHS	206786	9439321	47.2	49.9	39.0	34.7	67.1	58.1	52.6	10.9	55	54
NVR-2	Kaguruka Household	Residential	36+300	149	LHS	195771	9469746	42.7	44.2	33.8	27.0	65.0	53.1	45.4	10.4	55	54
NVR-3	Madandi Secondary School	Learning institution	52+950	315	RHS	185506	9482622	42.9	43.9	32.5	30.0	57.0	54.3	48.1	11.4	52	54
NVR-4	Kigule Primary School	Learning institution	65+210	124	LHS	184625	9492542	41.9	44.6	33.5	28.8	64.0	53.0	47.9	11.1	52	54
NVR-5	Nyakabondo Primary School	Learning institution	79+280	350	LHS	191328	9500624	42.3	43.1	31.4	28.6	73.4	54.0	48.2	11.7	52	54
NVR-6	Mkesha Baptist Church	Place of worship	88+400	77	RHS	197627	9505146	40.6	42.5	34.2	21.3	70.0	48.9	37.4	8.3	52	54
NVR-7	Shunga station	Residential	112+370	65	RHS	190000	9519896	50.1	46.2	35.5	23.5	78.0	60.8	48.3	10.7	55	54
NVR-8	Mgogo Primary	Learning institution	128+560	10	RHS	189333	9530135	43.0	44.6	32.4	29.0	70.4	55.2	51.2	12.2	52	54
NVR-9	Kihenya Secondary School	Learning institution	140+550	460	RHS	192576	9537680	43.6	45.2	34.0	31.0	74.7	54.8	48.8	11.2	52	54

b) Night-time baseline noise conditions

Figure 5-5 and Table 5-4 present a summary of night-time noise levels at various receptors along SGR Uvinza - Kigadye alignment. The night-time A-weighted equivalent continuous sound energy level L_{Aeq} (2 h) results ranged from 39.2 dB(A) (at NVR-3: Madandi Secondary School) to 45.6 dB(A) (at NVR-5: Nyakabondo Primary School). All the measured baseline noise levels during night time were in compliance with the WHO guidance on health and environment (2022) noise level of 44 dB(A) for railway noise with exception baseline noise level at NVR-5 Nyakabondo Primary School which was slightly higher mainly due to trucks and motorcycles passing by and social entertainment in the vicinity to the monitoring point.

About 66% (equivalent to 5 sensitive receptors) of the measured noise levels were found to be in compliance with the night-time Tanzania standard TZS 932: 2017 maximum permissible noise limit of 42 dB(A) prescribed for learning institutions and 45 dB(A) prescribed for residential areas. About 44.0% (equivalent to 4 sensitive receptors) of the measured noise levels were found to violate the maximum permissible noise level TZS 932: 2017.

Other night-time statistical noise indices measured during this study include LA_{10} which ranged from 41.8 to 53.0 dB(A); LA_{90} ranged from 34.4 to 41.5 dB(A); L_{Amin} ranged from 34.1 to 40.5 dB(A) and L_{Amax} ranged from 48.2 to 65.7 dB(A) as given in Table 5-4.

The Traffic Noise Index (TNI) which represents the extent of variation in traffic flow. The value of TNI 74 dB(A) is defined as the threshold criterion (*Langdon and Scholes: 1968*). The TNI varies in the range of 17.0 to 68.8 dB(A) and all monitoring points exhibited TNI under the threshold limit of 74 dB(A). Also, noise climate (NC) is the range over which the sound levels are fluctuating in an interval of time it varied in the range from 1.4 to 18.6 dB(A). Also, the value of Noise Pollution Level (NPL) varied in the range of 43.8 to 64.2 dB(A).

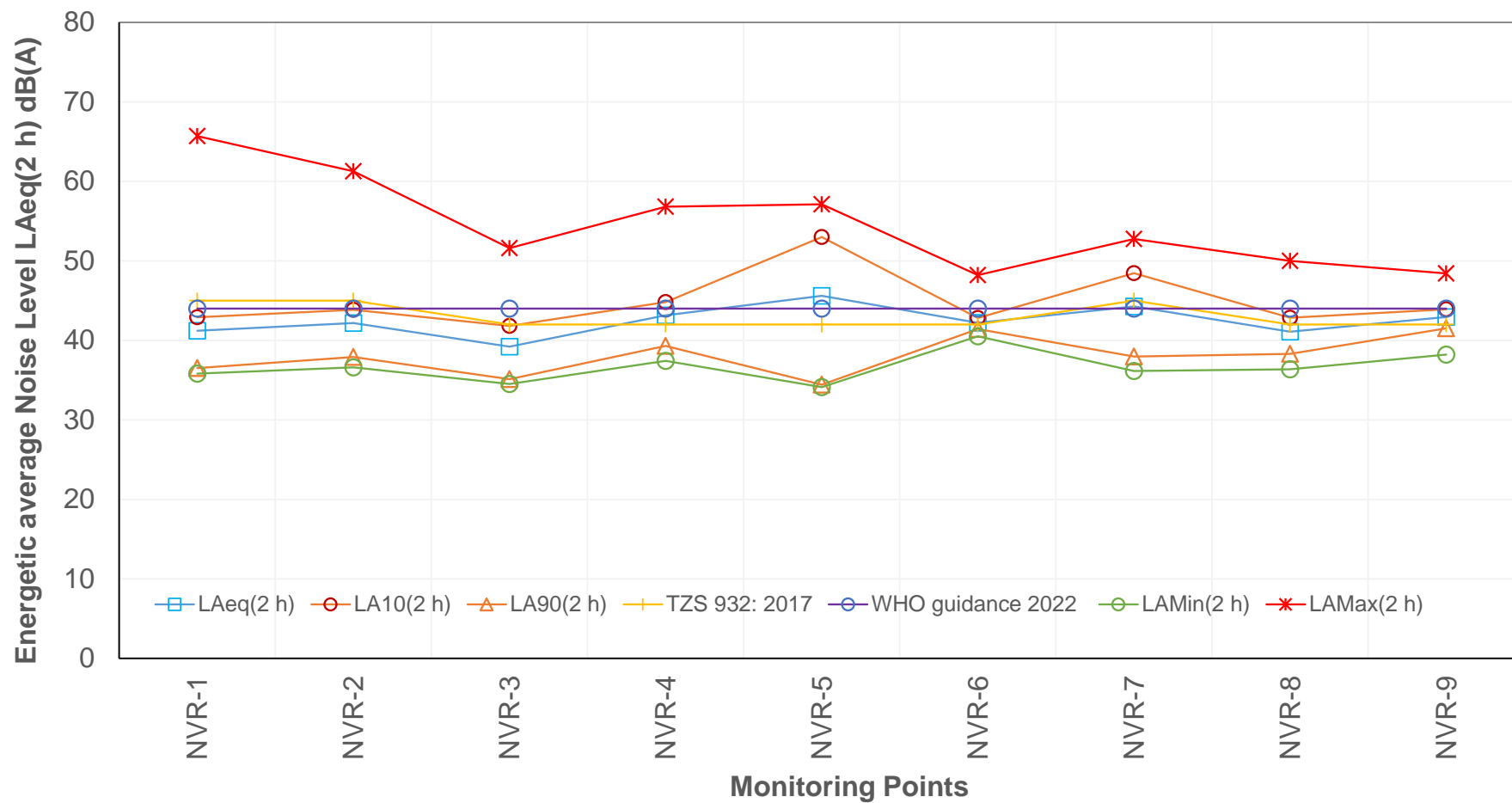


Figure 5-5: Summary of night -time baseline noise levels at various monitoring points

Table 5-4: Summary of night -time baseline noise levels at various monitoring points

Code	Monitoring location	Land use	Chainage (Km+000)	Distance from Track (m)	Side of the track (LHS /RHS)	Coordinates (UTM 36)		Energetic average of measured noise levels: dB(A)					Calculated noise levels: dB(A)			TZS 932: 2017	WHO guidance: 2022
						Eastings	Northings	LAeq (2h)	L10	L90	LA Min	LA Max	NPL	PNI	NC	dB(A)	dB(A)
NVR-1	Kibaoni household	Residential	0+800	45	LHS	206786	9439321	41.2	42.9	36.5	35.8	65.7	47.6	32.1	6.4	45	44
NVR-2	Kaguruka Household	Residential	36+300	149	LHS	195771	9469746	43.0	43.9	37.9	36.6	64.0	49.0	31.9	6.0	45	44
NVR-3	Madandi Secondary School	Learning institution	52+950	315	RHS	185506	9482622	39.2	41.8	35.1	34.5	51.6	45.9	31.9	6.7	42	44
NVR-4	Kigule Primary School	Learning institution	65+210	124	LHS	184625	9492542	43.1	44.8	39.3	37.4	56.8	48.6	31.3	5.5	42	44
NVR-5	Nyakabondo Primary School	Learning institution	79+280	350	LHS	191328	9500624	45.6	53.0	34.4	34.1	57.1	64.2	68.8	18.6	42	44
NVR-6	Mkesha Baptist Church	Place of worship	88+400	77	RHS	197627	9505146	42.2	42.8	41.4	40.5	48.2	43.6	17.0	1.4	42	44
NVR-7	Shunga station	Residential	112+370	65	RHS	190000	9519896	44.0	48.5	38.0	36.2	52.8	54.8	50.0	10.5	45	44
NVR-8	Mgogo Primary	Learning institution	128+560	10	RHS	189333	9530135	41.1	42.9	38.3	36.4	50.0	45.6	26.5	4.6	42	44
NVR-9	Kihenya Secondary School	Learning institution	140+550	460	RHS	192576	9537680	42.9	43.9	41.5	38.2	48.4	45.3	21.1	2.4	42	44

5.1.3.5 Observed baseline vibration levels

a) Vibration RMS-velocity profiles

Figure 5-6 shows a typical instantaneous variation of vibration-velocity during monitoring period at NVR-4 Kigule Primary School. The monitoring period was at least 10 hours during day-time and at least 3 hours during night-time. From this vibration profile, the minimum vibration level was 0.01 mm/s, maximum vibration level of 2.15 mm/s and vibration-RMS velocity of 0.110 mm/s. As can be seen from the figure, high vibration-velocity levels were recorded during day-time which is attributed to trucks and motorcycles passing near the monitoring point while insignificant vibration levels were recorded during night-time.

The measured vibration RMS-velocity level of 0.110 mm/s at Kigule Primary School is in compliance with vibration RMS-velocity for Federal Transmission Administration (FTA) and preferred Australian guidelines.

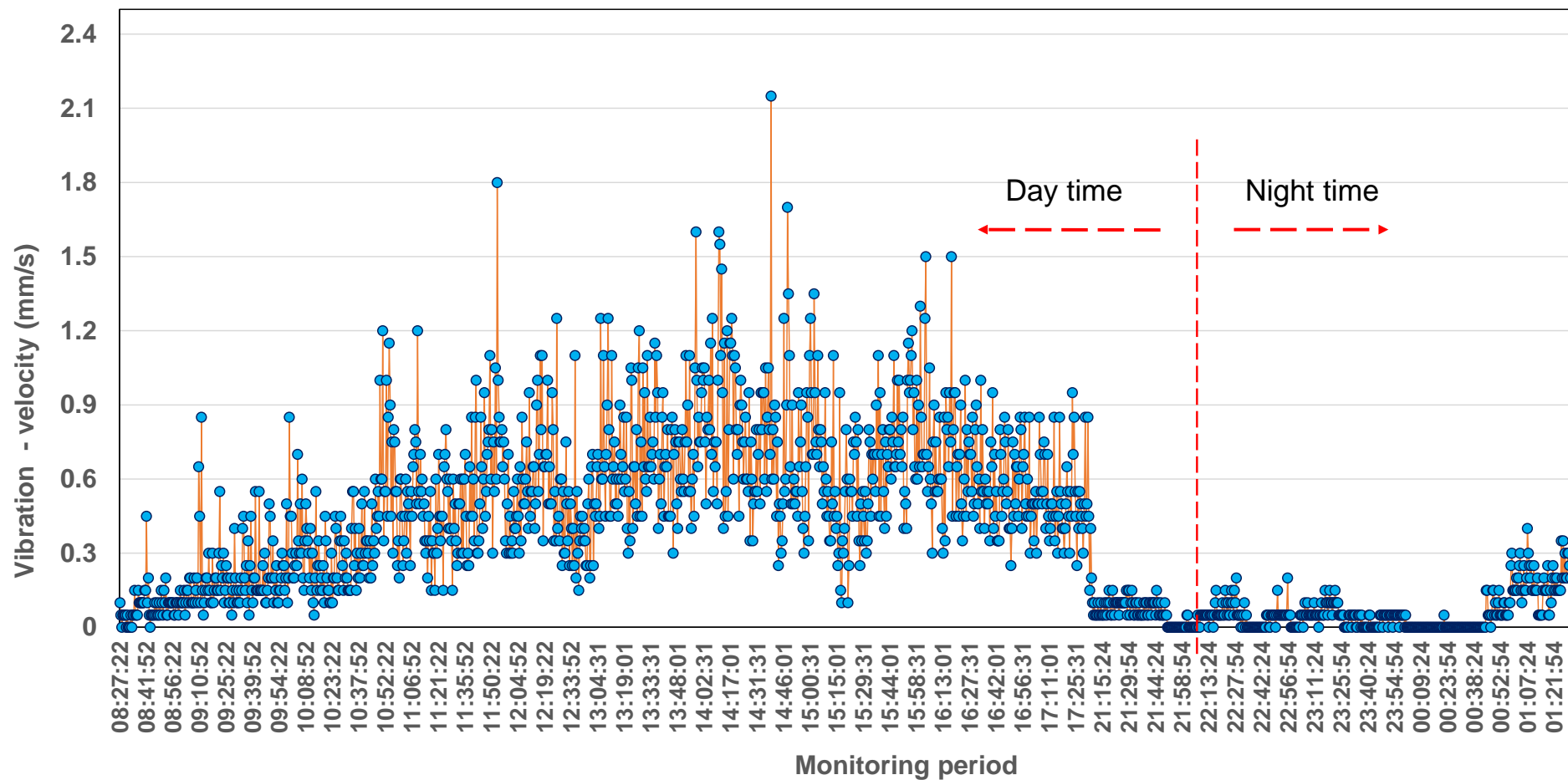


Figure 5-6: Variation of vibration (velocity) level with time at NVR-4 Kigule Primary School

b) Summary of Vibration RMS

Table 5-5 provides a summary of baseline vibration RMS-velocity measured at various sensitive receptors along SGR Uvinza-Kigadye alignment. The measured vibrations are compared to FTA and the Australian guidelines on vibration-velocity (RMS). Results of vibration RMS-velocity ranged from 0.011 mm/s (at NVR-4: Kigule Primary School) to 0.318 mm/s (at NVR-1 Kibaoni residential area).

About 44.4% (equivalent to 4 monitoring points) of the measured vibration RMS – velocity was found to be in compliance with FTA Guidelines vibration RMS-velocity level of 0.21 mm/s for residential areas and 0.26 mm/s for learning institutions and places of worship.

For the rest of the monitoring points, the measured baseline vibration RMS-velocity levels were higher than the vibration RMS-velocity for FTA.

Table 5-5: Summary of measured baseline Vibration RMS-velocity levels

Code	Monitoring location	land use	Chainage (Km+000)	Distance from the alignment	Coordinates (UTM 36 M)		Baseline vibration level (RMS – velocity)			FTA Guidelines (2006)
					Eastings	Nothings	Min (mm/s)	Max (mm/s)	Average (mm/s)	RMS (mm/s)
NVR-1	Kibaoni household	Residential	0+800	45	206786	9439321	0.0	1.70	0.318	0.21
NVR-2	Kaguruka Household	Residential	36+300	149	195771	9469746	0.05	1.13	0.243	0.21
NVR-3	Madandi Secondary School	Learning institution	52+950	315	185506	9482622	0.00	3.10	0.386	0.26
NVR-4	Kigule Primary School	Learning institution	65+210	124	184625	9492542	0.01	2.15	0.110	0.26
NVR-5	Nyakabondo Primary School	Learning institution	79+280	350	191328	9500624	0.00	1.50	0.250	0.26
NVR-6	Mkesha Baptist Church	Place of worship	88+400	77	197627	9505146	0.00	1.15	0.264	0.26
NVR-7	Shunga station	Residential	112+370	65	190000	9519896	0.00	1.75	0.313	0.21
NVR-8	Mgogo Primary	Learning institution	128+560	10	189333	9530135	0.00	0.65	0.120	0.26
NVR-9	Kihenya Secondary School	Learning institution	140+550	460	192576	9537680	0.00	0.41	0.160	0.26

5.1.4 Air quality

5.1.4.1 Equipment, Approach and Methods for baseline air quality

Ambient air sampling was conducted in accordance with Tanzanian standard **TZS 837 -2: 2020 (3rd Ed)** and WHO Ambient Air Quality Guidelines of 2005 as revised 2021. The sampling and measurements of baseline air quality conditions was conducted using an **Aeroqual Series 500** as illustrated in Photo 5-4 and Photo 5-5. This is a Portable Multi RAE Lite wireless portable multi gas monitor that utilizes an Aeroqual S500 V6.5 software. The instrument is in compliance with European standard EN 61779, EN 50104 and EN 45544.

The study for air quality was conducted from 14th to 25th June, 2023. The baseline conditions collected include PM2.5, PM10, NOx, SOx, COx and VOC. For all pollutants, data was collected on 24 hr (on 3X8 hourly basis) as per Tanzanian standard TZS 845: 2012 and WHO Air Quality Guidelines – 2021 requirement.

Table 5-6 and **Error! Reference source not found.** provide locations monitoring points for air quality.



Photo 5-4: Air quality equipment (Aeroqual S500 and sensors for various pollutants)

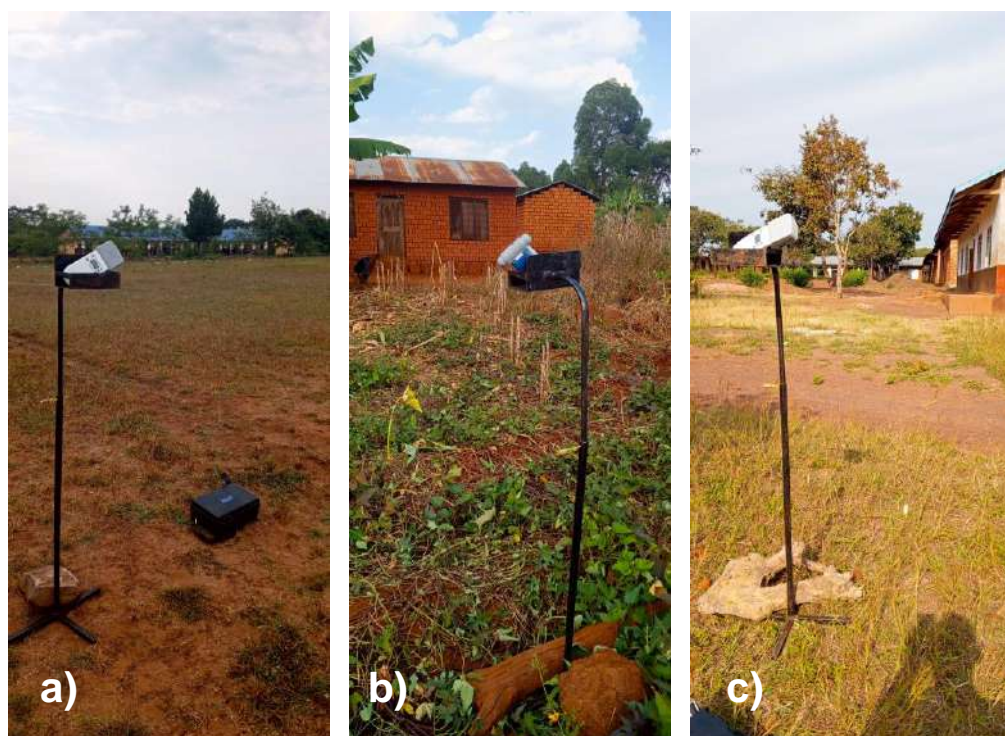


Photo 5-5: Aeroqual S500 monitoring set-up

a) De Paul Primary School, b) Shunga residential/Lugoma station, c) Kihenya Secondary School

Table 5-6: Location of monitoring for air quality

Code	Monitoring point	Land use	Distance from track (m)	Chainage (Km+000m)	Coordinates	
					Eastings	Northings
AQR-1	De Paul Primary School	Learning institution	453	0+700	206406	9439163
AQR-2	Kaguruka Primary School	Learning institution	540	36+100	195428	9469402
AQR-3	Kigule Primary School	Learning institution	315	52+950	185506	9482622
AQR-4	Madandi Secondary School	Learning institution	124	65+210	184625	9492542
AQR-5	Nyakabondo Primary School	Learning institution	350	79+280	191328	9500624
AQR-6	Mkesha Baptist Church	Place of worship	77	88+400	197627	9505146

Code	Monitoring point	Land use	Distance from track (m)	Chainage (Km+000m)	Coordinates	
					Eastings	Northings
AQR-7	Shunga residential area	Residential area	65	112+370	190000	9519896
AQR-8	Mgogo Primary School	Learning institution	10	128+560	189333	9530135
AQR-9	Kihenya Secondary School	Learning institution	460	140+550	192576	9537680

5.1.4.2 Observed baseline air quality conditions

Baseline concentrations for six (6) key air quality pollutants were recorded during additional study along SGR lot 5. These include: oxide of nitrogen (NO_x), carbon monoxide (CO_x), Sulphur dioxide (SO_x), PM_{2.5}, PM₁₀, Volatile Organic Compounds (VOC), and Ozone (O₃).

Particulate Matter (PM) in urban and rural environment is a complex mixture with components having diverse chemical and physical characteristics. The potential exposure and risks associated with PM are complicated due to heterogeneity and the possibility that potential particles to cause injuries varies with size and other physical characteristics, chemical composition and source(s). This study monitored two different size of particulate matter baseline conditions, that is particulate matter with size less than 10 µm (PM₁₀) and particulate with size less than 2.5 µm (PM_{2.5}).

a) Particulate Matter (PM₁₀, PM_{2.5})

Table 5-7 provides 24 hours averaging particulate matter for PM₁₀ and PM_{2.5} baseline concentrations at various monitoring points. The PM₁₀ baseline concentrations ranges between 18 µg/m³ (at AQR-1: De Paul Primary School) and 51 µg/m³ (at AQR-2: Kaguruka Primary School). About 89% of the measured baseline concentrations were in compliance with WHO Air Quality Guidelines (2021) threshold of 45 µg/m³ and the Tanzania standard TZS 845: 2019 threshold of 50 µg/m³. Non-compliant monitoring point is AQR-2 Kaguruka Primary school.

The average PM_{2.5} ranged between 10 µg/m³ at AQR-1 De Paul Primary School and 28 µg/m³ at AQR-2 Kaguruka Primary School. The high PM₁₀ and PM_{2.5} concentrations at Kaguruka Primary School is mainly due to the bare land and high wind blow during monitoring period. As observed from Table 5-7, 89% of the monitoring points were in compliance with Tanzanian standard TZS 845: 2019 threshold of 25 µg/m³.

Table 5-7: Summary of baseline PM10 and PM2.5 concentrations

Code	Monitoring point	Land use	Distance from track (m)	Chainage (Km+000m)	Coordinates (UTM 36 M)		PM10				PM2.5			
					Eastings	Northings	Min (ppm)	Max (ppm)	Ave (ppm)	Ave (µg/m³)	Min (ppm)	Max (ppm)	Ave (ppm)	Ave (µg/m³)
AQR-1	De Paul Primary School	Learning institution	453	0+700	206406	9439163	0.009	0.024	0.016	18	0.005	0.011	0.008	10
AQR-2	Kaguruka Primary School	Learning institution	540	36+100	195428	9469402	0.008	0.136	0.044	51	0.005	0.07	0.024	28
AQR-3	Kigule Primary School	Learning institution	315	52+950	185506	9482622	0.011	0.11	0.034	40	0.007	0.035	0.014	17
AQR-4	Madandi Secondary School	Learning institution	124	65+210	184625	9492542	0.01	0.068	0.031	36	0.006	0.02	0.014	17
AQR-5	Nyakabondo Primary School	Learning institution	350	79+280	191328	9500624	0.008	0.046	0.020	23	0.004	0.022	0.010	12
AQR-6	Mkesha Baptist church	Place of worship	77	88+400	197627	9505146	0.009	0.076	0.027	31	0.005	0.022	0.009	11
AQR-7	Shunga residential area	Residential area	65	112+370	190000	9519896	0.011	0.075	0.021	24	0.006	0.036	0.010	11
AQR-8	Mgogo Primary School	Learning institution	10	128+560	189333	9530135	0.012	0.284	0.030	35	0.008	0.028	0.012	15
AQR-9	Kihenya Secondary School	Learning institution	460	140+550	192576	9537680	0.01	0.035	0.022	25	0.007	0.013	0.010	11
Tanzania standard TZS 845: 2019										50				25
WHO Ambient Air Guidelines 2021										45				15

b) Ambient gaseous concentrations

Table 5-8 summarizes ambient gaseous concentrations pollutants at various sampling points along SGR Uvinza – Kigadye alignment. All sampling points were found with enough oxygen (O₂) level ranging from 20.7 % to 21.9%. This range value is normal and naturally present in air environment.

The ozone (O₃) ambient concentration ranges from 33 at AQR-1 De Paul Primary School and AQR-6 Mkesha Baptist church to 89 µg/m³ at AQR-4 Kigule Primary School. These baseline concentrations are in compliance with both Tanzania standard TZS 845: 2019 thresholds of 120 µg/m³ and WHO ambient air quality guideline 2021 threshold of 100 µg/m³. Similarly, NO₂ ambient concentrations ranged from 39 at AQR-8 Mgogo Primary School to 62 at AQR-6 Mkesha Baptist church. The values are compliance with both Tanzania standard TZS 845: 2019 and WHO ambient air quality guideline 2021 thresholds of 80 µg/m³. The volatile organic compound concentrations ranged between 0 and 46 µg/m³. Further, all monitoring points were detected with 0.00 ppm of carbon monoxide or was below the detection limit of the Aeroqual S500 sensor. Sulphur dioxide baseline concentrations ranged from 459 at AQR-1 De Paul Primary School to 717 at AQR-9 Kihanya Secondary School. These values are significantly higher and non-compliant to both Tanzania standard TZS 845: 2019 threshold of 80 and WHO ambient air quality guideline 2021 thresholds of 40 µg/m³.

Table 5-8: Summary of measured ambient gaseous concentration

Code	Monitoring point	Coordinates UTM 36M		O ₃			SO ₂			NO ₂			CO			VOC		
		Eastings	Northings	Min ppm	Max ppm	Ave µg/m ³	Min ppm	Max ppm	Ave µg/m ³	Min ppm	Max ppm	Ave µg/m ³	Min ppm	Max ppm	Ave µg/m ³	Min ppm	Max ppm	Ave µg/m ³
AQR-1	De Paul Primary School	206406	9439163	0	0.03	33	0	0.6	459	0	0.06	61	0	0	0	0.01	0.19	46
AQR-2	Kaguruka Primary School	195428	9469402	0	0.04	62	0	0.8	531	0	0.05	46	0	0	0	0	0.04	20
AQR-3	Kigule Primary School	185506	9482622	0	0.05	89	0	1	501	0	0.06	47	0	0	0	0	0.07	28
AQR-4	Madandi Secondary School	184625	9492542	0	0.04	48	0	0.7	531	0	0.08	46	0	0	0	0	0.04	20
AQR-5	Nyakabondo Primary School	191328	9500624	0	0.04	50	0	1.3	713	0	0.08	61	0	0	0	0	0.02	13
AQR-6	Mkesha Baptist church	197627	9505146	0	0.03	33	0	0.5	555	0	0.07	62	0	0	0	0	0.05	24
AQR-7	Shunga residential area	190000	9519896	0	0.03	50	0	0.7	586	0	0.04	46	0	0	0	0	0	0
AQR-8	Mgogo Primary School	189333	9530135	0	0.04	48	0	0.7	479	0	0.09	39	0	0	0	0	0	0
AQR-9	Kihenya Secondary School	192576	9537680	0	0.03	45	0	1.3	717	0	0.046	51	0	0	0	0	0.01	10
Tanzania Standard TZS 845: 2019						120			80			80			2000			-
WHO ambient air guideline 2021						100			40			80			4000			-

5.1.5 Greenhouse Gas Conditions

5.1.5.1 SGR Uvinza-Kigadye project area

The baseline conditions include the existing greenhouse gas (GHG) emissions, prior to the construction and operation of the Proposed Development. The track route corridor for SGR Uvinza - Kigadye covers approximately 1,079ha, along the 156.4 kms route. The route comprises a mixture of forest, farmland and shrub. Given the minimal development or activity on this area prior to construction of the Proposed Development, the baseline GHG emissions can be considered nil. Conversely, carbon is likely to be stored within vegetation and soil in this area and it can be considered a carbon sink.

5.1.5.2 National GHG emissions

Tanzania submitted its updated Nationally Determined Contribution (NDC) in July 2021 with estimated emission of 112,738 ktCO₂e in 1994 and 153,556 ktCO₂e in 2014. The national inventory (1994-2014) is shown in Figure 5-7 and Figure 5-8. The most significant gas is carbon dioxide (CO₂) followed by methane (CH₄) and then nitrous oxide (N₂O). The overall trend shows a steady rise in emissions across the time series. This trend is primarily from methane emissions and, to a lesser degree, carbon dioxide emissions. Nitrous oxide emissions vary across the time series but do not show a definitive trend.

The most significant sector is land use, land use change and forestry (LULUCF) followed by Agriculture, Waste, Energy and then industrial processes and product use (IPPU). All sectors show an increasing trend across the time series except for LULUCF, which has been comparatively flat across the time series.

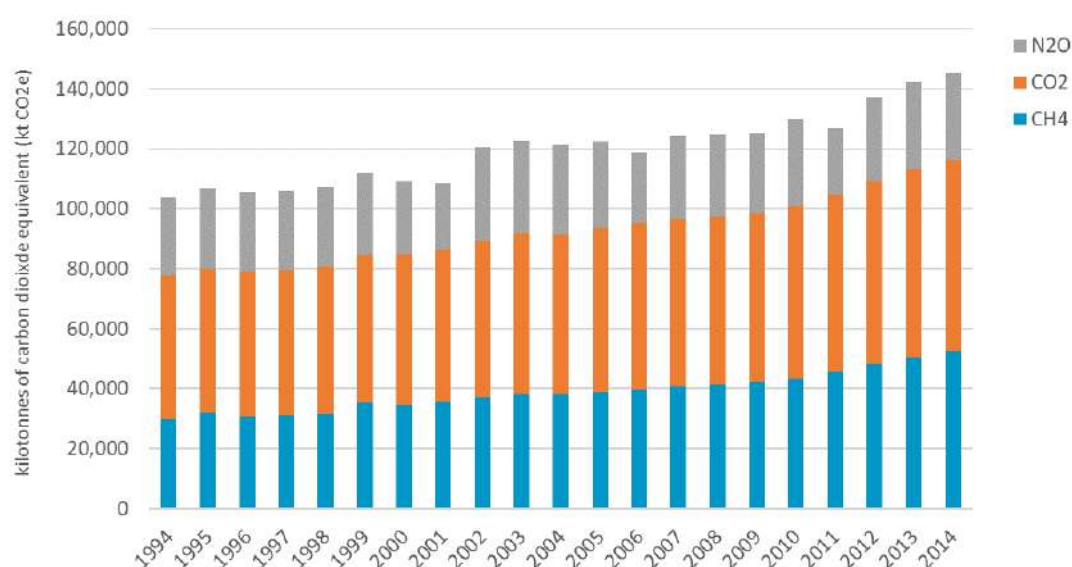


Figure 5-7: Summary of national GHG emissions (1994-2014) by gas

Source: Tanzania GHG Inventory Report, 2018

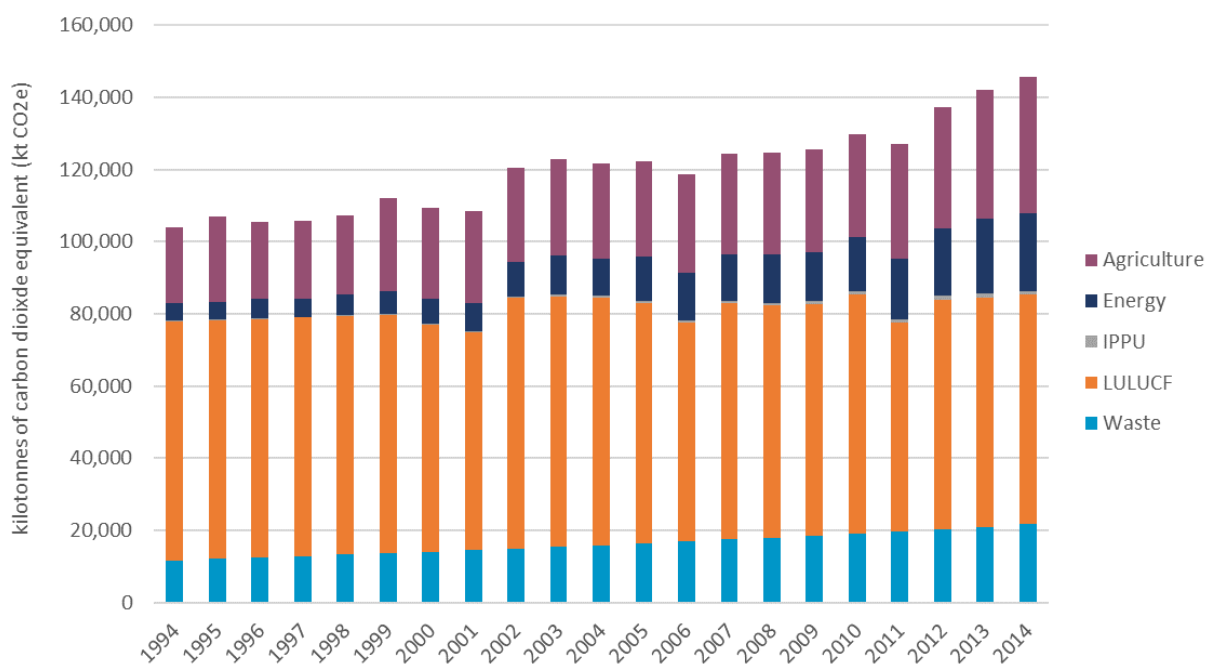


Figure 5-8: Summary of national GHG emissions (1994-2014) by Sector

Source: Tanzania GHG Inventory Report, 2018

5.1.5.3 Greenhouse gas projections

A Business as Usual (BAU) reference scenario was developed based on the updated GHG inventory. This scenario considers the evolution of the national energy system and anticipated GDP and population growth from 2014 to 2030. The BAU scenario does not account for the potential impact of any climate mitigation policies but is instead meant to give an indication of how GHG emissions in Tanzania could be expected to grow during this period, if no climate mitigation policies are developed as provided in Figure 5-9.

An assessment was also made of Tanzania's voluntary commitments submitted through its INDC, thus enabling a comparison to the BAU scenario. The INDC scenarios assume either a 10% (Low Ambition) or 20% reduction (High Ambition) of BAU emissions by 2030.⁴ Submitted to the UNFCCC in September 2015, Tanzania's voluntary commitments commence in 2016.

⁴ <http://www4.unfccc.int/Submissions/INDC/Submission%20Pages/submissions.aspx>

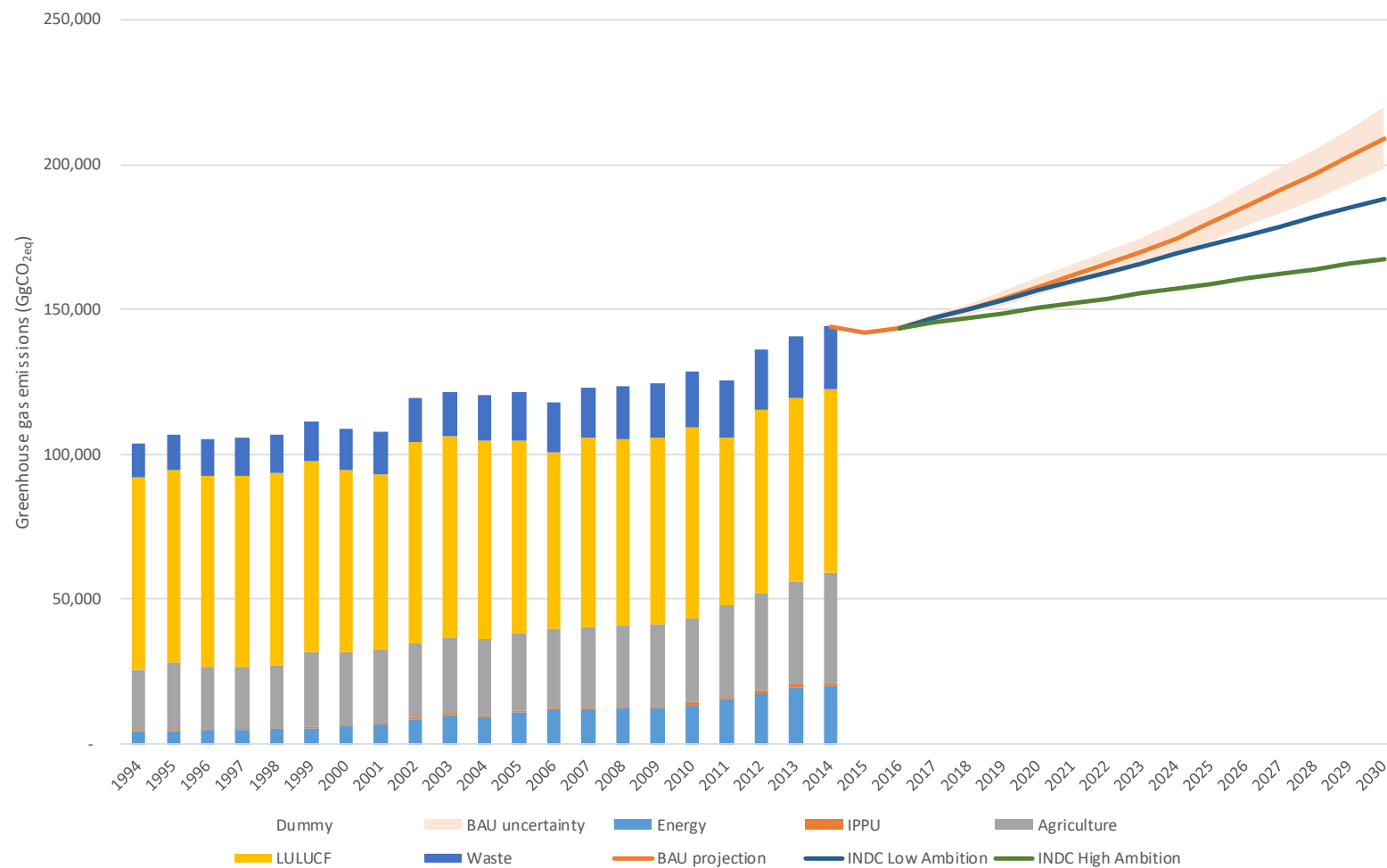


Figure 5-9: GHG emissions projections to 2030 representing historic emissions by sector (1994 - 2014), BAU (orange), INDC Low Ambition (blue), and INDC High Ambition (Green).

Source: Tanzania GHG Inventory Report, 2018

5.2 Biodiversity environment

5.2.1 Flora Characteristics

The Uvinza-Kigadye SGR corridor lies at the centre of three great ecosystems, the Massito-Ugalla ecosystem- south of the project area, Great Gombe ecosystem Northwest and the Muyowosi-Kisigo ecosystem northeast of the project. The vegetation of the project area falls under Zambezian regional centre of endemism which is part of the Greater African Subequatorial Savannas & Mixed Woodlands (AT11) covering the entire width of the continent from the drylands and grasslands of southern Africa north to the beginning of the Equatorial Forest zone, extending to the southern shore of Lake Victoria. The project area is characterized wet miombo woodland type varying in degree of degradation as modified by anthropogenic activities. The once continuous miombo woodland of Tabora to Kigoma is fragmented due to growth of settlement, agriculture, charcoal burning and grazing. The evidence of wet miombo can be seen in protected areas such as Massito located south of the project area, Lugufu forest reserve west of the project area and Mkuti forest reserve.

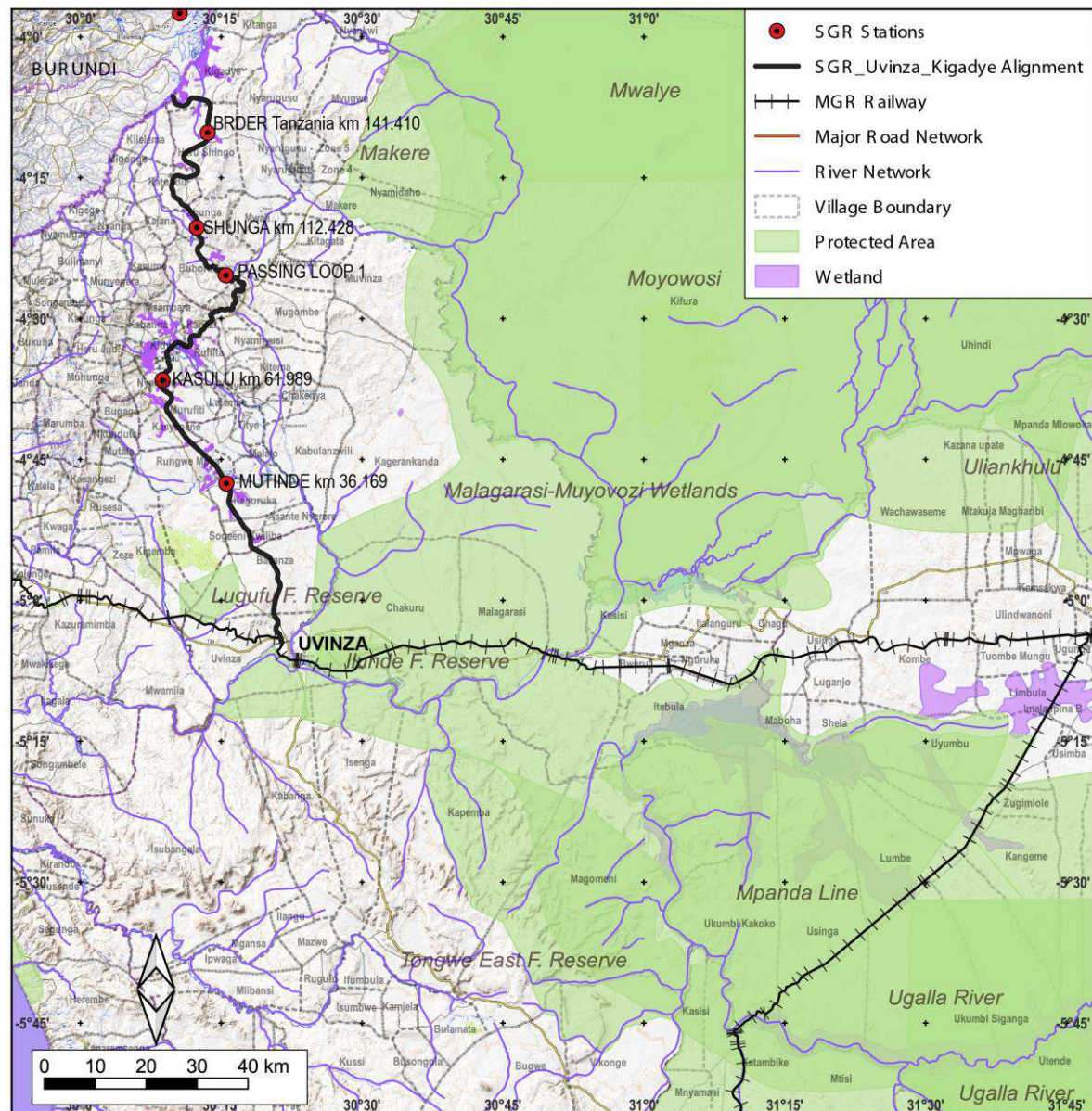
The corridor route is characterized by miombo woodland ranging from open to closed woodland. Within the district there are other forest reserves like Lugufu and Masanza forest reserves. Of the total forest areas of 2,037,100 hectares 873,722 hectares are forest reserve and the remaining 1,163,378 hectares fall under open public forests. Various anthropogenic factors such as human settlement, cultivation, grazing and refugee hosting have contributed to changes of the forest cover within the project area.

Currently the vegetation of the project area can be classified into dense woodland, open woodland, scrub land, riverine vegetation and crop cover in farm lands. The dense woodlands are found in Massito Forest Reserve and Uvinza Forest Reserve; the proposed railway will cut through the Basanza Forest Reserve owned and managed by Tanzania Forest Service Agency (TFS). The open woodlands are more common outside protected areas (reserves) and since they are unprotected, they are highly degraded mostly by settlement, cultivation, construction materials and fuel wood consumption particularly in areas formally occupied by refugees and grazing in area where cattle are available.

Illegal timber harvesting targeting valuable tree species such as *Pterocarpus angolensis* (Mninga), *Khaya nyasica* (Mkangazi), *Azelia quanzensis* (Mkongo), *Melicia excelsa* (Mvule) and *Brachystegia spiciformis* (Mtundu). In highly degraded states, shrubs and scrub vegetation types are evident; similarly riverine vegetation is commonly seen along streams and rivers as well as in permanent and seasonal swamps and wetlands.

At the wider level several protected areas such as Makere Forest Reserve, Muyowosi Game Reserve located close to the border of Burundi in the western reaches of Tanzania. The Moyowosi Reserve is contiguous with Kigosi Game Reserve and is divided by the Moyowosi River and its affluent. Moyowosi is chiefly a floodplain wetland habitat, declared a RAMSAR Wetland of international importance. Gazetted in 1981, Moyowosi now provides a sanctuary for wildlife and migratory birds during the dry season. Thus, the project corridor is likely to traverse through

dispersal areas /Uvinza Open Area or to the proximity to the Game Reserve. The following vegetation types were identified from the project area.



Map 5-3: Ecosystems at close proximity to the project area

Source: ESIA Team, 2023

✓ **Miombo woodland**

The baseline survey on flora characterized the stretch of the railway corridor from Uvinza the starting point to Asante Nyerere west of Muyowozzi game reserve part of Rungwe mpya and north of Katundu village near Shunga village and Heru-Ushingo being dominated by miombo type of vegetation varying in characteristic species, tree density, understory characteristics and level of degradation. The section covered by miombo type of vegetation constitutes about 30% of the entire SGR length from Uvinza to Kigadye.

Miombo flora community are known to harbour valuable timber species as such are highly targeted for harvesting. Field survey identified valuable timber species like *Pterocarpus angolensis*, *Pterocarpus tinctorius* (CITES Appendix iii) *Azania quanzensis*, *Dalbergia melanoxylon* (CITES appendix ii), *Albizia versicolor*, *Isobelinia angolensis* and *Albizia harveyi* along and within the proposed railway ROW, borrow pits, quarry sites, dump sites, workers camps, and stations. Miombo woodland flora community within the ROW are common especially on central to western Tanzania and are unlikely to qualify as 'highly threatened and/or unique ecosystems' or 'areas associated with key evolutionary processes' in accordance with IFC criteria for Critical Habitat (IFC, 2012).

✓ **Grassland vegetation Eucalyptus/Pinus woodlot**

Grassland vegetation community is characteristic from west of Mtabila JKT camp extending on rolling hills to Nyansamba village. Much of this area is used for grazing and farming in valleys and lowland areas. The extensive grassland on rolling hills is interrupted by varying size of woodlots mainly of *Eucalyptus* ssp and *Pinus patula* species.

✓ **Phragmites –Cyperus/papyrus Dominated Community**

This flora community characterizes permanent wetland on flood plains with seasonal to permanent rivers and streams. The flora community is more common in all rivers crossed by the SGR corridor more prominent being Shunga River, Malagarasi and Muyowozu. These sites are nutrient rich area attracting rapid growth of *Papyrus* sp and Reed species with significant population of invertebrates providing suitable feeding grounds for aquatic birds. Species characterizing the areas are *Cyperus exaltatus*, *Phragmites mauritianus*, *Pennisetum purpureum*, *Cynodon dactylon*, *Polygonum senegalense*, *Hydrocotyle sibthorpioides*, *Chenopodium album*, *Citrullus lanatus*, *Ipomoea aquatica*, *Ipomoea cairica*, *Lemna minor* and *Nicandra physalodes*.

✓ **Shrubland Characterized by Regenerating Woodland**

This type of community occurs in previously disturbed area where the condition has allowed the vegetation to regenerate. The Uvinza –Kigadye SGR corridor and associated components touches this type of vegetation at Ruchugi village and Mtabila area. The size of regenerating patches and age of the tree plants within the woodland varies significant depending on nature of disturbance experienced. Area impacted by charcoal burning appeared to be highly affected compared to similar areas impacted by tree cutting and grazing. The characteristics species on this regenerating woodland are *Terminalia catappa*, *Brachystegia* ssp, *Markhamia* ssp, *Combretum collinum*, *Combretum mole*, *Combretum zeyheri*, *Markhamia obtusifolia*, *Combretum celastroides*, *Dichrostachys cinerea*, *Julbernardia globiflora*, *Bussea massaiensis*, *Brachystegia spiciformis*, *Albizia harveyi*, *Excoecaria bussei*, *Senna singueana*,

✓ **Agro-pastoral Vegetation**

Modified vegetation in the form of agricultural crops produced along the project area constituted a variety of food and cash crops grown by local communities living around the project area. The intensity of farming is high from Asante Nyerere village, Rungwe mpya, and Kasulu town all the way to Mtabila.

Rare and Threatened Plant Species.

The global conservation status of most species recorded during baseline survey on SGR RoW and associated facilities have not been assessed by the IUCN and therefore rated “Not Evaluated. However, there are few recorded plant species with conservation status as defined by IUCN 2017 as presented in Table 5-9

Table 5-9:List of Plant species with conservation status identified in the project areas

SN	Family	Species Name	IUCN Status	CITES appendix No
2	Asphodelaceae	<i>Aloe vera</i>	LC	II
3	Fabaceae	<i>Pterocarpus tinctorius</i>	LC	II
4	Fabaceae	<i>Dalbergia melanoxylon</i>	NT	II
5	Euporbiaceae	<i>Euphorbia tirucali</i>	LC	II
6	Orchidaceae	<i>Polystachya setifera</i>	EN	

VU= Vulnerable, EN = endangered, CR= critically endangered, NT=near threatened, LC = less concern source: [IUCN Red List of Threatened Species](#). 2017, IUCN 2018

Invasive Species

Degradation observed along Uvinza –Kigadye SGR ROW has allowed the infestation of invasive species in different part of the project area. During flora baseline survey for the SGR RoW and associated facilities five plant species classified as invasive species *Leucaena leucocephala*, *Calotropis procera*, *Bidens pilosa*, *Lantana camara*, *Imperata cylindrica* and *Syzygium cumini*. Activities of the project may contribute to spreading these invasive species to other areas not infected. In comparison with other area within the country the extent of spread of Invasive species in the project area is low. Five of the species recorded are on the list of invasive species of Tanzania as per Global Biodiversity Information Facility (GBIF) database.

5.2.2 Fauna Characteristics

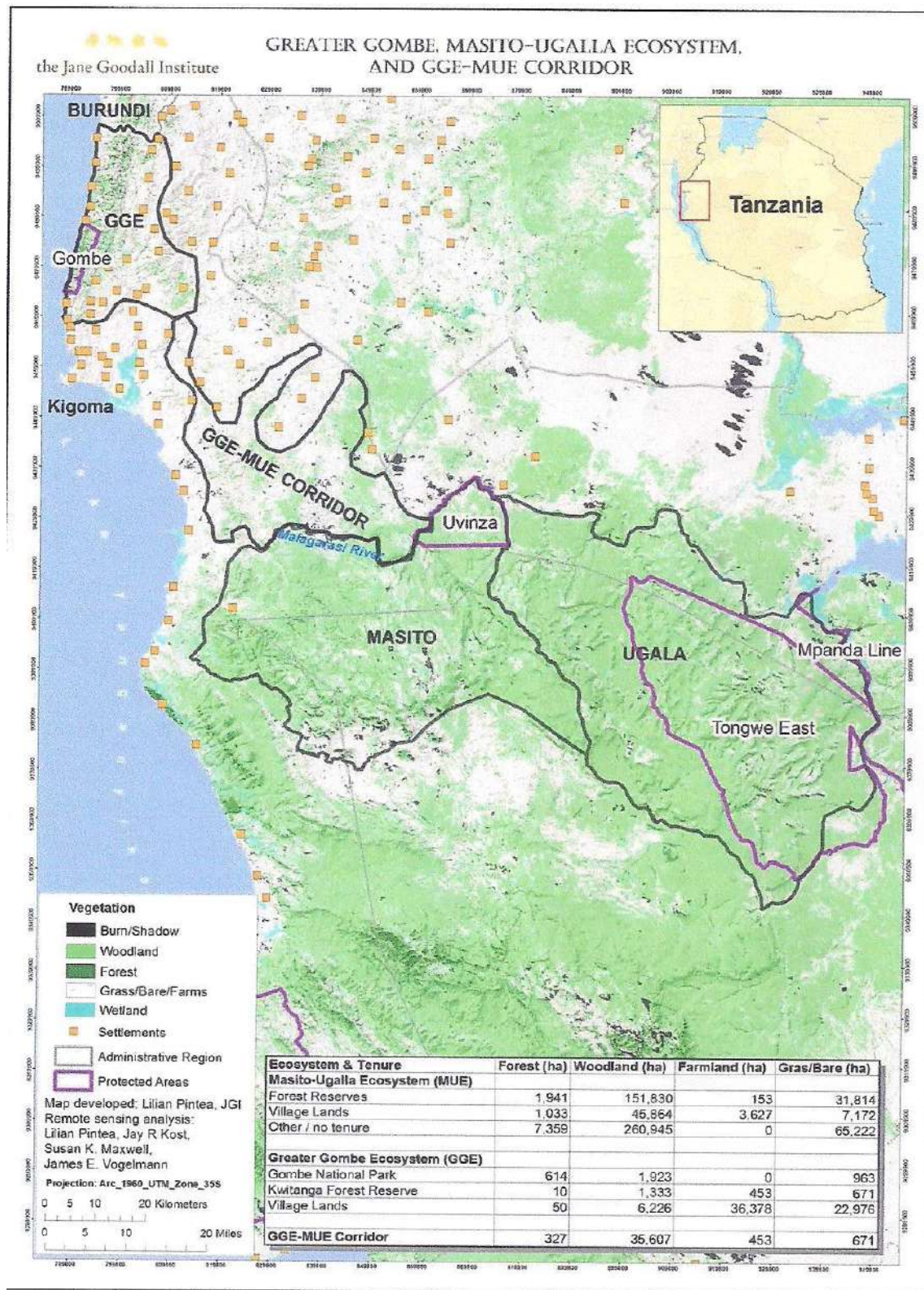
The Uvinza to Msongati railway line will traverse parts of the Greater Gombe-Ecosystem (GGE) which connects Gombe National Park and Kwitanga Forest (the latter being the largest remaining natural forest east of Gombe NP that has a documented community of chimpanzees. Kwitanga Forest is said to be home to approximately 26 chimpanzees. The high chimpanzee density and population size

estimates in Kwitanga forest makes this area an important conservation objective for Greater Gombe Ecosystem. Other recent chimpanzee sightings have been reported in areas bordering Gombe National Park: southeast of Mwamgongo to southeast of Bugamba, and western Mgaraganza. Gombe chimpanzees visit these areas occasionally to feed on banana and oil palm on people's farms. In some cases, chimpanzee feed on natural food species occurring in the area, such as Matunguru (*Afromomum* spp) that ripen in April and May every year. Gombe is the smallest national park in Tanzania, with only 20 square miles (52 km²) of forest running along the hills of the eastern shore of Lake Tanganyika.

Nestled between the Gombe National Park and Mahale Mountains National Park, the Masito-Ugalla Ecosystem (MUE) is a sparsely-population and relatively unprotected forest habitat that is home to more than 500 chimpanzees and other endangered or threatened species such as the red colobus monkey, bush baby, elephants, eland, hartebeest, and duikers. Several corridors link the Greater Gombe Ecosystem and Masito-Ugalla which is bordered by the Kwitanga Forest and Malagarasi River (map 4).

Impact of the proposed railway and trains on wildlife movements is likely to be associated with cumulative physical blockade of wildlife corridors, agriculture and settlement encroachment into wildlife protected areas, habitat alteration including fragmentation, and direct barrier effects as they cross the Uvinza Forest Reserve due to railway construction (and associated high human presence and noise) with varying effects on different animal species. Some species would avoid the railway altogether at much greater distances than others, requiring different conditions for crossing (e.g. chimpanzees). This could lead to fragmentation of wildlife populations and the consequent collapse of the GGE functionality and species extinction. Specifically, cumulative impacts would be due to blockade of any wildlife movement among Lugufu, Uvinza and Ilunde Forest Reserves.

Relatively more significant cumulative impacts are likely to result from blockade of wildlife corridors due to the combined presence of railway networks of railways and trains movement comprising of the Central railway from Dar es salaam to Kigoma, the Uvinza to Msongati railway and the Kaliua to Mpanda and Karema railways within the Greater Gombe - Mahale - Katavi Ecosystems (GGMKEs), which harbor an incredibly high biodiversity species of fauna and flora including the chimpanzees (*Pan troglodytes*) and elephants (*Loxodonta african*) which are one of the flagship species for western Tanzania. Other wildlife protected areas in the GME include Lukwati, Luafi and Rukwa Game Reserves. Taken together, Katavi NP and the surrounding reserves of Lukwati, Luafi and Rukwa, form one of the most impressive ecosystems in Africa (TAWIRI, 2009). Several established elephant corridors (the Katavi-Mahale Corridors), criss-cross these areas and any railway line alternative selected in the area is likely to cross and block these corridors (TAWIRI, 2009).



Map 5-4: The Greater Gombe-Masito-Ugalla Corridors

✓ Fauna Habitats

Fauna habitats along the SGR alignment from Uvinza to Kilema falls within the following major habitat types; protected areas (Game Reserve, Forest Reserve,

Ramsar sites) open area and designated forested areas, wetlands/aquatic habitats, and agroecosystems. The importance of the key habitats in supporting fauna species in the areas are discussed in subsections below. The identified habitats considered the AfDB requirements in particular OS3-Biodiversity and Ecosystem Services. These habitats are grouped under either 'natural' or 'modified' habitats. Under this categorization all protected areas are considered as natural habitats whereas the agro-pastoral land is grouped under modified habitat.

✓ **Protected areas**

The protected areas in close proximity to Uvinza –Kilema SGR ROW are Ugalla Game Reserve (>70 km), Moyowozi Game Reserve and Ramsar site (<50 KM), Malagarasi wetland Ramsar site is east of the project area about 70 Km. However, the project line ends at Malagarasi River at the border with Burundi), Masito Forest Reserve (7 km), Lugufu Forest Reserve (11km), Basanza Forest Reserve (within the ROW) and Uvinza Open Area currently referred as Uvinza Ranch (3 km). These protected areas are recognized both at national and international categories (under IFC standards and AfDB biodiversity guiding note).

✓ **Wetlands**

The Uvinza-Kilema SGR alignment crosses some areas (Photo 5-6) that are characterized as wetlands in categories including the marshes, rivers, riverine forests, inland drainage systems and flood plains (Ramsar Convention on Wetlands, 2018). The wetland areas are known as wildlife rich areas. Near the alignment traverses close about 50 km from Muyowozi wetland Ramsar site (Ramsar Convention on Wetlands, 2018).

The key sites sampled that are crossed by SGR alignment are: Ruchugi, Lugoma marsh area, Mgera river as well as Malagarasi river where the line ends on the Tanzania side. The wetlands located within the Project Area are of variable habitat quality whereas a large part of it is cultivated and/or grazed. Highly disturbed wetlands are the Ruchugi lower and upstream flood plains that are that are already utilized as source of water for communities and are used as agriculture paddy plains, livestock grazing land during dry season and source of irrigation for agriculture activities.



Photo 5-6: Farming activities along SGR Uvinza - Kigadye alignment

- a) Vegetable farming along Msebehi Riverine, within 60m distance from the center of the river; b) Rice Farming in Kaguruka village, Ruchugi River flood plains: source Field data 2023

Accordingly, the flood plains are also habitats for wildlife including fish, birds, amphibians, and small mammals among others (Photo 5-7).



Photo 5-7: Some fauna species of fish, amphibians and Hippo footprint encountered at Kaguruka wetland areas, source Field Data

Wetlands are also known to support a variety of species of amphibians, mammals, and reptiles. A total of 11 amphibians have been recorded from the Uvinza-Kigadye SGR alignment.

On the other hand, mammals also do utilize the wetlands. In many cases, mammals do reside closest to water sources. Most mammals which utilise habitats along Uvinza-Kigadye SGR alignment are generalists and use wetlands and terrestrial habitats (i.e., forests) for refuge and to forage. Their habitat usage is partly dependent on the flooding patterns and many mammals move to drier areas during heavy rain (Wakwabi et al., 2006). Wetlands located in the ROW are highly unlikely to support a large diversity and abundance of large mammals, particularly those located within Ruchugi (Kaguruka village) flood plains and within Masanza Forest Reserve because these areas are highly degraded with high levels of disturbance. Most of these areas are typically farmlands with large number of livestock therefore have fewer large mammals than it used to be in the past. The stakeholders in Kagogo sub-village in Basanza village indicated that lions used to cross the areas. However, despite the degradation, elephants are still spotted in the areas (despite the decreased frequency). The elephants and lions have high conservation value. The National Red List for Tanzania (IUCN, 2022) have classed Elephants as Vulnerable species thus require to be prioritized in conservation measures.

✓ ***Agro-pastoral land***

The agriculture land within Uvinza-Kigadye falls under the modified habitat. Agro-pastoral land, fallow land and plantations located within the ROW are likely to support birds and small mammals that are adapted to modified habitats and disturbance. A significant forest clearing for farming and settlement is evident throughout the ROW. These disturbances threaten the wildlife populations utilizing the areas.

✓ ***Summary of Priority Habitats and Species within Uvinza-Kigadye SGR alignment***

Considering the above key habitat types identified in the Uvinza-Kigadye Right of Way (RoW) and surrounding environment, it is evident that the areas is already fragmented and degraded by human activities that include farming. Therefore, fauna species are under threat from habitat loss and other sources of anthropogenic disturbance. Nonetheless, the baseline assessment identified several priority habitats and species of conservation importance for the Project. A summary of the known features of priority habitats and species are presented in Table 5-10. The effective management of these priority biodiversity values is expected to be a key issue for the permitting of the Project. Some of these habitats have also been identified as providing priority ecosystem services for the Project.

Table 5-10: Summary of identified priority habitats and species in the Uvinza-Kigadye alignment

Type of Risk Receptor	Priority Biodiversity Values	IUCN Status	National Threat Status	Confirmed presence in ROW
Legally Protected Areas	Forest reserves		T	+
	Wildlife Corridors		T	+
	Game reserves		T	+
	Open Areas		T	+
Priority Natural Habitats (and fauna habitats)	Wetlands		T	+
				+
	Forest habitats			+
	Wetlands		T	+
Large Mammals	Giant Pangolin (<i>Smutsia gigantea</i>)	EN	EN	Reported
	Elephants (<i>Loxodonta africana</i>)	VU	VU	+
	Zebra (<i>Equus burchellii</i>)	NT	NT	Reported
	Lion (<i>Panthera leo</i>)	V	V	Reported
	Spotted Hyena (<i>Crocuta Crocuta</i>)		V in public land	+
Birds				
	Towny eagle (<i>Aquila rapax</i>)	VU	VU	+
Herpetofauna		LC	LC	+

Source, Field data, (2023); Key: EN = Endangered, VU = Vulnerable, NT = Near Threatened,

✓ Existing Threats to Biodiversity along the Uvinza-Kigadye SGR alignment

Habitat quality and species diversity in the ROW and surrounding environment has so far been impacted by anthropogenic disturbance. The regions have history of human habitation and thus agricultural land use has featured prominently in the area. The most recent survey has indicated that, the areas are highly degraded by human therefore contribute to death of creeping fauna (Photo 5-8).



Photo 5-8: Forest degradation activities in Masanza Forest Reserve that cause damage to fauna habitat

source Field Data2023

Some of the existing threats to biodiversity along the Uvinza-Kigadye SGR alignment are listed as follows:

✓ **Threats to miombo ecoregion**

Illegal timber harvesting targeting valuable tree species such as *Pterocarpus angolensis* (Mninga), *Khaya nyasica* (Mkangazi), *Afzelia quanzensis* (Mkongo), *Melicia excelsa* (Mvule) and *Brachystegia spiciformis* (Mtundu). In highly degraded states, shrubs and scrub vegetation types are evident; similarly riverine vegetation is

commonly seen along streams and rivers as well as in permanent and seasonal swamps and wetlands.

✓ **Vegetation clearing for farm expansion and livestock keeping**

The clearing for rice farming and livestock keeping has been witnessed during field surveys. Discussions with some stakeholders in the areas indicated that, the areas along Uvinza-Kigadye alignment have been invaded by Sukuma who tend to clear large spaces of forests for agriculture and livestock keeping. Movements of Sukuma is common in Tanzania, and the behavior to clear forests is not uncommon in other places. Communities are also undertaking small scale farming along the riverine forests within 60 m distance, which is against the Tanzania Environmental law. These activities pose a serious risk to biodiversity in the areas.

✓ **Wildfires**

Use of fire for the clearing of land for agro-pastoral activities and as a management tool. Bushfires have contributed to the large-scale degradation and destruction of habitats within the areas. Some wildfires were observed during field surveys as can be seen on the figure with plates below where one area closest to our sample point was put on fire for fodder preparations in Shunga village.

5.2.3 Critical Habitat Assessment

5.2.3.1 Overview

This Critical Habitat Analysis (CHA) for the SGR Uvinza –Kigadye line is conducted on the basis of Biodiversity and ecosystem services requirement of the AfDB. The operational safeguard 3 has the following objectives.

- To preserve biological diversity by avoiding, or if not possible, reducing and minimizing impacts on biodiversity;
- In cases where some impacts are unavoidable, to endeavor to reinstate or restore biodiversity including, where required, the implementation of biodiversity offsets to achieve “not net loss but net gain” of biodiversity;
- To protect natural, modified and critical habitats; and
- To sustain the availability and productivity of priority ecosystem services to maintain benefits to the affected communities and to sustain project performance.

The operational safeguard is triggered if a project is to be located in a habitat where there may be potential biodiversity impacts or in areas providing ecosystem services upon which potentially affected stakeholders are dependent for survival, sustenance, livelihood or primary income, or which are used for sustaining the project. It is also triggered if the project is designed to extract natural resources as a main purpose (e.g. plantation forestry, commercial harvesting, agriculture, livestock, fisheries and aquaculture). The construction of SGR line from Uvinza to Kilema Kigoma region will

traverse in areas with protected area within the project corridor (for Masanza forest Reserve) and in close proximity (Mkuti, Lugufu, Uvinza south).

5.2.3.2 Critical habitat qualifying features

The determination of Critical Habitat on the SGR Uvinza to Kilema line is made on the project basis Operational Safeguard (OS 3 Biodiversity and ecosystem services) of the AfDB 2015. Critical habitat is defined in Paragraph 16 of the 2012 version of IFC Performance Standard 6 (IFC PS6) as an area with high biodiversity value. This includes areas that meet one or more of following criteria.

Critical habitat criteria

The IFC uses five criteria for determining which habitats qualify as critical habitat.

✓ Criterion 1

Criterion 1 includes species threatened with global extinction and listed as Critically Endangered (CR) and Endangered (EN) on the IUCN Red List of Threatened Species. As per paragraph GN72 of PS6 / GN6, the thresholds for criterion 1 are:

- a) Areas that support globally important concentrations of an IUCN Red-listed EN or CR species ($\geq 0.5\%$ of the global population AND ≥ 5 reproductive units of a CR or EN species).
- b) Areas that support globally important concentrations of an IUCN Red-listed Vulnerable (VU) species, the loss of which would result in the change of the IUCN Red List status to EN or CR and meet the thresholds in GN72(a).
- c) As appropriate, areas containing important concentrations of a nationally or regionally listed EN or CR species.¹

✓ Criterion 2

Species that are assessed under Criterion 2 are those that are considered to be endemic or restricted range. As per GN6, these are species that have a limited extent of occurrence (EOO). Specifically, for terrestrial vertebrates and plants, restricted-range species are defined as those species that have an EOO less than 50,000 square kilometres (km²). For coastal, riverine, and other aquatic species in habitats that do not exceed 200 km width at any point (for example, rivers), restricted range is defined as having a global range of less than or equal to 500 km linear geographic span (i.e., the distance between occupied locations furthest apart).

The threshold for criterion 2 is:

- a) Areas that regularly hold $\geq 10\%$ of the global population size AND ≥ 10 reproductive units of a species.

✓ Criterion 3

Criterion 3 refers to migratory and congregatory species. Migratory species are defined as any species of which a significant proportion of its members cyclically and predictably move from one geographical area to another (including within the same ecosystem). Congregatory species are defined as species whose individuals gather in large groups on a cyclical or otherwise regular and/or predictable basis.

Thresholds for Criterion 3 are the following:

- a) areas known to sustain, on a cyclical or otherwise regular basis, ≥ 1 percent of the global population of a migratory or congregatory species at any point of the species' lifecycle.
- b) areas that predictably support ≥ 10 percent of the global population of a species during periods of environmental stress.

✓ **Criterion 4**

Criterion 4 refers to highly threatened or unique ecosystems, with the IUCN Red List of Ecosystems to be used as a guide. There are two criteria:

- a) areas representing $\geq 5\%$ of the global extent of an ecosystem type meeting the criteria for IUCN status of CR or EN.
- b) other areas not yet assessed by IUCN but determined to be of high priority for conservation by regional or national systematic conservation planning.

✓ **Criterion 5**

Criterion 5 refers to "key evolutionary processes". Concepts included within this are:

- Landscapes with high spatial heterogeneity are a driving force in speciation, as species are naturally selected based on their ability to adapt and diversify.
- Environmental gradients, also known as ecotones, produce transitional habitat, which has been associated with the process of speciation and high species and genetic diversity.
- Edaphic interfaces are specific juxtapositions of soil types (for example, serpentine outcrops, limestone, and gypsum deposits), which have led to the formation of unique plant communities characterized by both rarity and endemism.
- Connectivity between habitats (for example, biological corridors) ensures species migration and gene flow, which is especially important in fragmented habitats and for the conservation of metapopulations. This also includes biological corridors across altitudinal and climatic gradients and from "crest to coast."
- Sites of demonstrated importance to climate change adaptation for either species or ecosystems are also included within this criterion.

Additionally, and in particular when considering unique evolutionary traits at a species level, the “Evolutionarily Distinct and Globally Endangered” (EDGE) species list is used synonymously with Criteria 5. EDGE species are considered to have the potential to trigger critical habitat under Criterion 5, as they have been assessed by a recognized body as being “evolutionarily distinct”.

The objectives of the OS 3 (Biodiversity and ecosystem services) of ESAP 2015 of the AfDB are similar to those of PS 6 of IFC 2012. Thus, the definition of Critical Habitat provided in IFC 2012 applies in this case. Performance standard 6 (PS6: IFC 2012) defines quantitative thresholds for Criterion 1 to 3. If these thresholds are exceeded an area qualify as a Critical Habitat Status. Criteria 4 and 5 are qualitatively assessed. PS 6 also defines two ‘tiers’ of Critical Habitat with quantitative thresholds for criteria 1 -3 (Table 5-11).

In addition to these five main criteria, Protected Areas and Internationally Recognized Areas will also often qualify for Critical Habitat Designation. Critical Habitat May also qualify on Case-by Case. OS 3 of the ESAP 2015 include Areas that supply ecological networks as critical habitats. Designation of an Area as Critical Habitat is independent of the state of the habitat as some of Critical Habitat -qualifying species may be present even in heavily degraded modified habitat (IFC, 2012). OS 3 gives special attention to the major threats to biodiversity and ecosystem services, such as pollution and contamination, land conversion, habitat fragmentation, natural habitat loss, deforestation, over-exploitation of natural areas and resources, invasive alien species, migration barriers, the capturing of wild animals, the harvesting of endemic species and indigenous ornamental flora and fauna, and wildlife poaching.

Should the project wish to demonstrate alignment with OS 3 and Critical Habitat status is confirmed, the requirements of IFC PS6 paragraph 17 apply:

“No other viable alternatives within the region exist for development of the project on modified or natural habitats that are not Critical.

The project does not lead to measurable adverse impacts on those biodiversity values for which the Critical habitat was designated, and on the ecological process supporting those biodiversity values;

The project does not lead to a net reduction in the global and/or national/regional population of any Critically Endangered or Endangered species over a reasonable period of time; and

A robust appropriately designed and long-term biodiversity monitoring and evaluation program is integrated into client’s management programme”

In addition, if offsets are used, the project should demonstrate a net gain for Critical Habitat-qualifying biodiversity/ features.

Critical Habitat-qualifying features (i.e. habitats and species) were determined using all available information gained through primary data gathered from field surveys of the project footprint and its surroundings area of influence conducted for the SGR Uvinza to Kigadye line ESIA, extensive review of the literature and use of biodiversity databases. Information pertaining to non-angiosperms flora group was included as part of the assessment. The majority of the flora recorded consists of angiosperm

plants (tree, shrubs, herbs, grasses and lianas), reptiles, amphibians, fish and invertebrates are also provided and are included in the critical habitat analysis.

In particular conservation assessment by the IUCN Red List of Threatened Species 2018 has not been conducted for many species to identify their global conservation status. Therefore, it is possible that Critical Habitat-qualifying features are missed due to scarcity of background information and conservation status assessment.

5.2.3.3 Scope of the screening exercise

IFC guidelines require that assessors use a landscape-scale approach that considers ecological connectivity and sensitivities. This should then be developed into an ecologically appropriate area of analysis (EAAA) for each individual trigger species identified within the spatial scope of the project.

For this screening exercise, a standard area of influence (AOI) for the SGR Uvinza to Kilema foot print (alignment and any other identified material sources) was considered, using a standard buffer of 500m from the alignment and pre- identified borrow pit / quarry and camp locations. The area of influence for this project Uvinza to Kilema was extended systematically from a standard 500 m buffer, 5 km, and 15 km zone of influence. When considering the overall area for the screening assessment, the Integrated Biodiversity Assessment Tool (IBAT) includes an additional 50km buffer in every direction. Due to the nature of the project and associated construction works, interconnected surface and groundwater drainage will be considered at the design level, with box-culverts bridges and overpasses designed to minimise the inherent impacts to the hydrology of the site. In the event that potentially sensitive species identified by IBAT may be impacted by temporary impacts to the hydrological environment of the site, the subsequent species-specific EAAA will be expanded to account for potential impacts across wider drainage basins if required.

This EAAA for species with CH potential will consider how the wider area is connected ecologically. The establishment of the EAAA for each species is an iterative process and it will be adjusted as new information is acquired throughout the process.

✓ Literature and data review

Following the establishment of the projects AOI (considered for this screening exercise as the alignment, all auxiliary locations and a 500m buffer), an initial data set was downloaded from the IBAT alliance website which draws on internationally accepted scientific databases and literature, including:

- The IUCN Red List of Threatened Species
- The World Database on Protected Areas (WDPA)
- The World Database of Key Biodiversity Areas (KBA)

Where feasible, these are supplemented by various sources, including:

Academic literature

- Government publications

- NGO publications
- Satellite imagery

✓ **Screening analysis**

Each species identified was assessed against the five critical habitat criteria to provide a shortlist of potential trigger species. The IBAT report generated for this project also included a GIS deliverable which provides distributions for listed species where they have been mapped.

While analysis of this species-level data could not be completed prior to mobilisation, the screening exercise aims to highlight potential sensitives which can be explored further by subsequent assessment and surveys if required. The output for this stage was to categorise species, habitats and locations by whether or not it / they are likely to trigger critical habitat by each criterion. For those that were considered likely triggers, recommendations were made for the next actions to refine findings and to determine the status or otherwise of critical habitat for species across the length of the Uvinza –Kilema alignment.

The analysis is summarized, and the key findings presented, in tables per trigger species within this document. The full list of species and protected areas recorded is provided as annex 12.2.

Table 5-11: Quantitative thresholds or Tiers 1 and 2 of Critical Habitat Criteria 1 -3, source IFC 2020

Criteria	Tier 1	Tier 2
Critically Endangered (CR) /Endangered (EN) Species	<p>Habitat required to sustain $\geq 10\%$ of global population of a CR or EN species /subspecies where there are known, regular occurrences of species and where that habitat could be considered a discrete management unit for that species</p> <p>Habitat with known, regular occurrences of CR or EN species where that habitat is one of 10 or fewer discrete management sites globally for that species</p>	<p>Habitat that supports the regular occurrence of single individual of a CR species and/or habitat containing regionally important concentrations of a Red-listed EN species where that habitat could be considered a discrete management unit for that species /subspecies.</p> <p>Habitat of significant importance to CR or EN species that are wider ranging and/or whose population distribution is not well understood and where the loss of such a habitat could potentially impact the long-term survival of the species</p> <p>As appropriate, habitat containing nationally/regionally important concentrations of EN, CR or equivalent National/regional listing.</p>
Endemic/Restricted Range species	Habitat known to sustain $\geq 95\%$ of the global population of an endemic or restricted range species where that habitat could be considered a discrete management unit for that species (e.g. single -site endemic).	Habitat known to sustain $\geq 1\%$ but $< 95\%$ of the global population of an endemic or restricted -range species where that habitat could be considered a discrete management unit for that species, where data are available and /or based on expert judgement.
Migratory /congregatory Species	Habitat known to sustain, on a cyclical or otherwise regular basis $\geq 95\%$ of the global population of a migratory or congregatory	Habitat known to sustain, on a cyclical or otherwise regular basis $\geq 1\%$ but $< 95\%$ of the global population of a migratory or

	species at any point of the species lifecycle where that habitat could be considered a discrete management unit for that species.	<p>congregatory species at any point of the species lifecycle and where that habitat could be considered a discrete management unit for that species, where adequate data are available and /or based on expert judgement.</p> <p>For birds, habitat that meet Birdlife International's Criterion A4 for congregatory and/or Ramsar Criteria 5 or 6 for identifying Wetlands of International Importance</p> <p>For species with large but clumped distributions, a provisional threshold is set at $\geq 5\%$ of the global population for both terrestrial and marine species</p> <p>Source sites that contribute $\geq 1\%$ of the global population.</p>
Areas that supply ecological networks.	Critical habitats can include areas that are not being protected or managed, and they may be outside legally protected and designated areas. Habitats may be considered critical if their ecosystem functions or species rely on or provide connectivity with other critical habitats, including legally protected critical habitat areas.	Sites that contribute $\geq 10\%$ of critical habitat connectivity for critical habitat qualifying species e.g Elephants and Chimpanzee

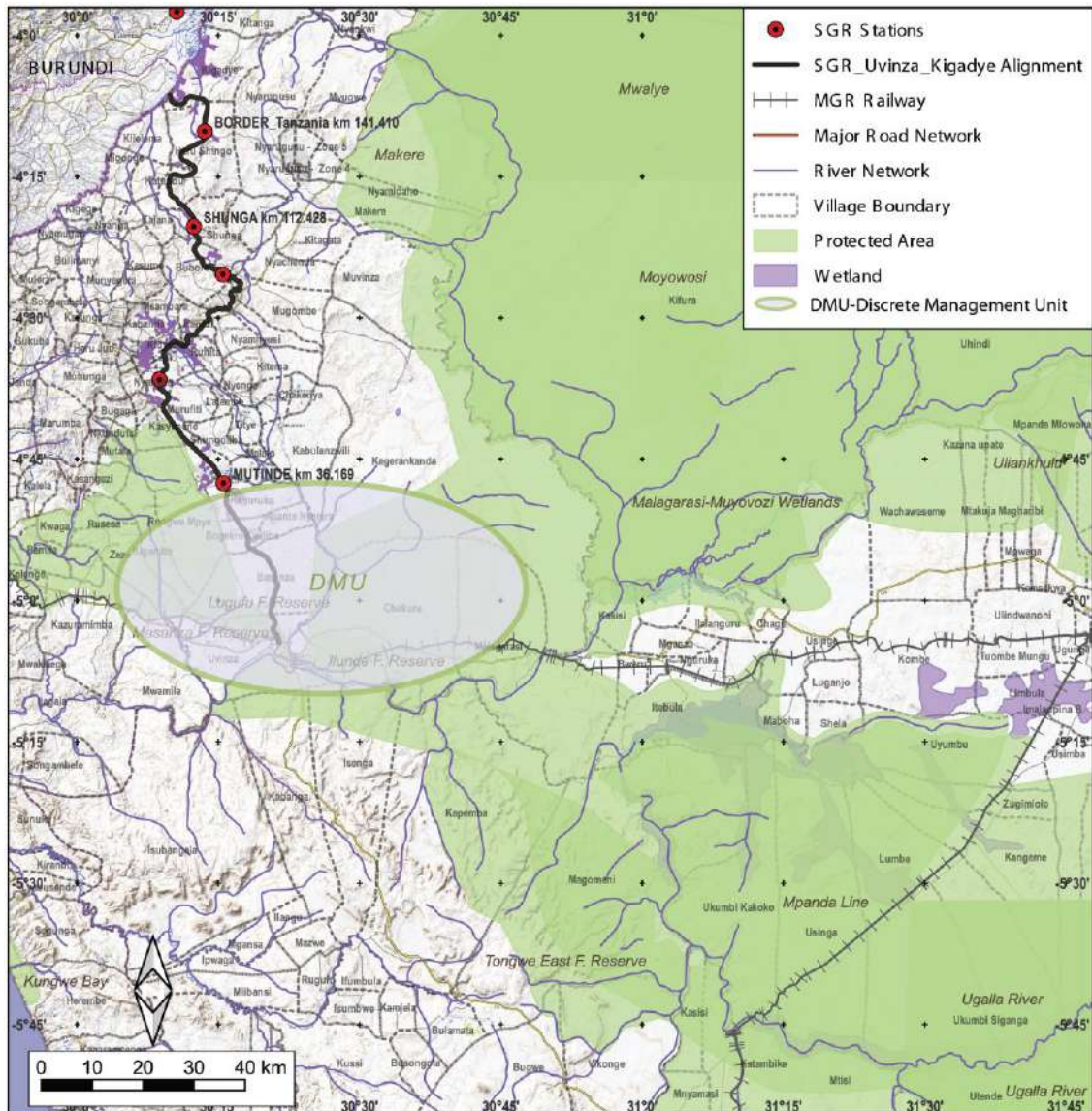
5.2.3.4 Discrete Management Unit Definition

The Critical Habitat Analysis was conducted for a defined area referred to as the Discrete Management Unit (DMU). The DMU is defined by IFC performance standard 6 (2012) as “An area with definable boundary within which the character of biological communities and/or management issues have more in common with each other than they do with those in adjacent areas”. It should be noted that this area can be defined as an area with an actual management boundary (e.g., legally protected areas) but can also be defined as an area with a defined ecological definable boundary (e.g., watershed, intact forest patch etc.). The determinations of DMU depend on the species or subspecies of concern, and the ecological context in which they occur. Multiple DMUs can be defined to ensure all potential Critical Habitat-qualifying species are considered, however for clarity and consistency the preference is to keep the number of DMU as low as possible.

5.2.3.5 DMU for the Project

Considering the ecological context of the project and the characteristics of the potential Critical Habitat-qualifying species, it was decided that the area in from Uvinza south FR, Malagarasi River, Masanza FR, Lugufu FR, Mkuti FR, wildlife Ranch across Ruchugi River, Ruchugi River and its extension to Muyowozzi Game Reserve would be appropriate to different species groups identified and thus was designated as DMU (Map 5-5). The DMU is based on presence of elephant, elephant and other wildlife corridor and dwellings, presence of flora and fauna species with conservation status. The inclusion of Uvinza south Forest reserve in DMU though not touched by the project present the closest possible Chimpanzee habitat. Literature indicates their presence in Uvinza south forest reserve. According to reports north of Uvinza there is no potential for Chimpanzee habitats (Ref Tanzania Chimp Action Plan 2018- 2023). The DMU chosen is considered ecologically meaningful discrete area for flora and fauna in the project as there no other viable habitats supporting the movement of elephants across the SGR other than the designated DMU.

Priority and other potential Critical Habitat qualifying species that were identified for the project were screened against the criteria to assess the potential presence of Critical Habitat in the project footprint and its surrounding. In accordance with the standard practice is potential Critical Habitat qualifying species or habitat could be considered in multiple criteria, such as an Endangered species being also a migratory species, they were assessed against the thresholds with the highest priority criterion (i.e., the lowest number of criterion).



Map 5-5: DMU Map for the project

✓ **Criterion 1: Critically Endangered and/or Endangered species**

Globally Critically Endangered and Endangered species were considered in this category. Globally Threatened species status was sourced from IUCN 2016, IUCN 2017 and IUCN 2018 Red listed species. In case species was classified by IUCN as Not assessed, or Data deficient the potential of the species to have Critical Habit was still considered with reference to Tanzania/National protection status and other reference sources.

No globally endangered mammal species was recorded in the DMU, the baseline fauna and flora survey confirmed elephants, small mammals, amphibians, reptiles, birds and insects recognized by IUCN protection status. While literature indicates that Chimpanzee are present in uvinza south forest reserve. Each group is discussed separately to emphasize the Critical Habitat defining species.

- **Mammals**

Chimpanzee was recorded as globally endangered mammal's species within the DMU. Literature indicates the presence of Chimpanzee in Uvinza South Forest Reserve located about 5 km from the project area. However, the project will not affect their habitats as the direction where the project is heading is opposite direction to the forest reserve with chimpanzee potential. Also, there is a significant bearer (Malagarasi River between the uvinza south forest reserve and the project area. Also, a globally endangered mammal species, African Elephant (*Loxodonta Africana*) and Zebra (*Equus burchellii*) (Uvinza Ranch) listed by IUCN as Near threatened (NT) (Table 5-12) were identified as present in the habitat of and surroundings the project within the DMU. Other mammals recorded are classified as Least concern and are not used to qualify a critical habitat defining species.

Table 5-12: Critically Endangered or Endangered mammal species assessed for critical habitat Tier 1 or Tier 2

Family	Common name	Scientific name	DMU %	Tier	IUCN Status	Tanzania status
Hominidae	Chimpanzee	<i>Pan troglodytes</i>	<1	2	EN	EN
Elephantidae	African Elephant	<i>Loxodonta africana</i>	<1	2	EN	EN
Equidae	Zebra	<i>Equus burchellii</i>	<1	2	NT	NT

Source *IUCN Red List of Threatened Species* in 2016. *Pan troglodytes* is listed under criteria A4bcde.

- **Flora**

No globally critically endangered plant species was recorded in the DMU, however, an Orchid species *Polystachya setifera* classified by *IUCN Red List of Threatened Species* in 2016 as Endangered under criteria B2ab(iii); D. *Polystachya setifera* was recorded outside DMU in fringe vegetation surrounding the swampy wetland near Kilema village. Also, *Dalbergia melanoxylon* (L.) (classified by IUCN as Near threatened (NT) was identified as present in the habitat of and surroundings the project within the DMU (Table 5-13)

Table 5-13: Critically Endangered or Endangered Flora species assessed for critical habitat Tier 1 or Tier 2

Family	Common name	Scientific name	DMU %	Tier	IUCN Status	Tanzania status
Orchidaceae	Orchids	<i>Polystachya setifera</i>	-	2	EN	EN
Fabaceae	African Black wood	<i>Dalbergia melanoxylon</i>	<1	2	NT	NT

✓ **Criterion 2: Endemic and/or Restricted -range species**

Endemic, biome restricted, and restricted range species were assessed from species known to occur in the project area footprint and the surroundings. Information for endemism and restricted ranges species were sources from existing National database such GBIF, checklist of endemic species for Tanzania published in reports and websites (e.g., Living Nature Treasures).

Table 5-14: Endemic and/restricted range flora species assessed for critical habitat in either Tier 1 or Teir 2

Family	Common name	Scientific name	DMU %	Tier	IUCN Status	Tanzania status
Oleaceae		<i>Schrebera trichoclada</i>	<1	2	UNK	EE

✓ **Criterion 3: Globally significant concentration of migratory species and/or congregatory species**

No globally significant concentration of migratory and /or congregatory species were recorded or reported in the habitat of and surrounding area within the DMU

✓ **Criterion 4: Highly Threatened and/or Unique ecosystem**

No globally highly threatened and/or unique ecosystem was recorded.

✓ **Criterion 5: Area associated with Key Evolutionary process**

Based on literature review, no landscape or subpopulation near the project is likely to qualify under this criterion 5, since the area has been altered by human activities including grazing, agriculture and settlement.

5.3 Socio-Economic Environment

5.3.1 Socio-Economic Characteristics

This part describes the current socio-economic baseline conditions of the communities that will be affected by the proposed Standard Gauge Railway (SGR) Project, in order to determine the impacts and associated mitigation measures required to minimise negative impacts and enhance positive impacts.

The socio-economic characteristics of the regions within the project cut across different ethnic groups with varying population characteristics as well as varying economic activities and cultures. The discussion on the socio-economic characteristics of the proposed project will focus on one Region and four districts/town councils crossed by the proposed SGR project.

5.3.2 Area of Influence (Aol)

The Area of Influence for the project is between 5 km to 15 km from the centre of the proposed SGR alignment. Thus, people within the Aol may be directly or indirectly impacted by the project. On the other hand, people within the Right of Way (RoW) of (30m on either side of the centreline) will be directly impacted due to noise and vibration, loss of land, loss of livelihoods, and loss of access to public services and infrastructure.

5.3.3 Uvinza District

a) Location and Land size

Uvinza district is in North-Western part of Tanzania at latitude 5° 00' and 6° 00' South of equator and longitude 29° 35' and 31° 30'E. The district borders Kasulu and Kigoma districts in the North, in the East it is bordered by Tabora region while in South is bordered by Katavi region and in the West by Kigoma/Ujiji municipality and the Democratic Republic of Congo within Lake Tanganyika. The Uvinza district covers an area of 10,178 km² which represent 22.8 % of Kigoma region. Of the land size, 6,425km² is covered by water mainly, Lake Tanganyika. Administratively, it has 3 Divisions, 16 Wards, 61 villages and 328 vitongoji. . A map showing the Uvinza district is shown in map 4.



Map 5-6: Map of Uvinza District

Source: Uvinza District Strategic Plan 2017/2018-2021/2022.

b) Population Characteristics

Based on Tanzania population and Housing census of 2022, Uvinza District Council has a population of 458,353. Among the population, 225,107 are males and 233,247 are females. The district population annual growth rate stood at 4.4 which is higher than the regional and national population annual growth rates of 2.4 and 2.7 respectively. The number of households in Uvinza district household 91,323 size with an average household size of 5.0 is which is slightly lower than the regional which is 5.7.

The project area is characterized by varying population characteristics in terms of number, growth rate and population density. These trends will have socio-economic implication on the project in terms of economic contribution and benefits. The population distribution for the project affected districts and wards are shown in Table 5-15.

Table 5-15: Population distribution in the project affected wards

Districts	Wards	Population			Number of households	Average Household size
		Male	Female	Total		
Districts						
Uvinza District		225,107	233,247	458,353	91,323	5.0
Wards						
Uvinza	Uvinza	21,230	21,872	43,102	8,931	4.8
Uvinza	Basanza	10,399	10,884	21,283	3,961	5.4

Source: NBS, 2022 Tanzania Population and Housing Census, 2022

c) Social services

✓ Education

According to Uvinza district socio-economic profile, 2016, the district has a total of 139 pre- primary and primary schools with a total number of 6,616 pupils. There are 19 secondary schools which have a total of 4,677, among them 3,075 are boys and 1,602 are girls. Kasulu District has 110 governments registered pre-primary schools, 138 primary schools of which 134 are government owned and 4 are private owned, 37 Secondary schools which are 27 Government, 10 non-governmental secondary schools and 3 A-level secondary schools, 3 vocation training colleges, 2 teachers' colleges and 1 agricultural training college. The district is currently establishing modern library situated at Kasulu town.

✓ Health services and facilities

Malaria has been a leading killer disease amounting 11,653 cases and 164 deaths, following by anaemia 1,684 cases and 91 deaths, Pneumonia number of cases 1,856 and 74 deaths respectively. Others are AIDS/STI and Diarrheal. Children are most vulnerable group affected by these diseases. However, number of AIDS cases has been declining from 2010 to 2012 especially to women. In terms of health facilities, the district has 2 Hospitals these are Kabanga referral hospital owned by Faith Based Organization (Roman catholic) and Mlimani district hospital under government both situated at Kasulu town, 8 Health Centres 1 owned by private, 7 by government/public and 46 of which 41 owned by public and 5 Dispensaries by private sectors.

✓ Water supply

Uvinza district council has about 52.9 percent of its population who get water from different improved sources such as springs, rivers, deep and shallow wells and Lake Tanganyika. The main rivers used as a source of water in Uvinza district include

River Mugonya, Luiche and Mukuti. Rain harvest is also undertaken during rainy season.

d) Economic Activities

✓ Agriculture

Agriculture is the main income generating activity in the two Districts. Over 85% of inhabitants depend on crop and animal husbandry and the remaining percentages depend on other sectors, such as beekeeping and petty businesses. The main food crops in the district include are maize, beans, cassava, sweet potatoes, groundnuts, banana and paddy. The main cash crops include tobacco, sugar cane, palm oil, coffee and sunflower.

✓ Livestock keeping

Livestock keeping practiced in Uvinza traditional and commercial in nature. A large proportion of cattle, goats and sheep are indigenous kept by pastoralists and agro pastoralists. The numbers and types of livestock kept in the two districts are shown in Table 5-16.

Table 5-16: Number of Livestock in Uvinza for 2014

N0.	Type of Livestock	
1	Indigenous Cattle	45,800
2	Dairy cattle	-
3	Goat	250,900
4	Sheep	18,670
5	Pig	8,790
6	Poultry	305,780

Source: Uvinza Socio-economic Profiles, 2021

✓ Mining

The initial leg of the railway corridor is characterized by a salt mining. The Uvinza salt mining is an important historical economic activity that has been in operation well before independence. It is estimated that 60,000 tons of salt is produced per year. There is also potential for other types of minerals in the district such as Nickel, Cobalt, Platinum, Moonstone, Galena, Palladium, Blue copper, gold, iron and limestone.

✓ Fisheries

Fisheries is an important economic activity in Uvinza district. The district has potentials for aquaculture because in the southwest the district is boarded by Lake Tanganyika which has 6425km² of water body, a shoreline of 212km, and the Sagara and Nyamagoma dams as well as Malagarasi river.



Photo 5-9: Fishing in Sibwesa and a Fish market in Sanusa Village in Uvinza

✓ **Beekeeping**

The railway corridor traverses huge forest reserves in Uvinza districts that are potential for beekeeping, as there are many nectars yielding tree species and flowery agricultural plants. Beekeeping in Uvinza district is practiced in Nguruka, Mtego wa Noti, Chagu, Mganza, Ilagala, Kandaga, Sigunga, Itebula, Sunuka, Kalya Basanza, Irunde Kasisi, Lukunda, Kachambi na Buhingu.

5.3.4 Kasulu district council

Kasulu District council is in the western part of Tanzania in Kigoma Region between longitude 3°00' 06' -3 00 55' East of prime meridian and Latitude 30°45'00 -4°34' South of the Equator. It is about 90 kilometers to the east of Kigoma town and is surrounded by Malagarasi River to the west north of Kasulu district council; it is bordered by Kibondo district in the North, Country of Burundi to the Northwest, Uvinza district to the east, Kigoma district to the south and Buhigwe district to the southwest.

a) Land area and land uses

The District Council covers a total area of 5,324 km² (532,400 ha) which is approximately 11% of the total area of Kigoma region. Agriculture and livestock keeping are major land uses found in the district. The district has attractive landscapes with fertile soils and favourable climatic conditions for animal husbandry and agriculture.

Population and Administration

Kasulu District Council is divided into 3 divisions, 21 wards, 62 villages and 288 Vitongoji. The district has one election constituency namely Kasulu Rural Constituency.

b) Demographic characteristics

The results of the National Population and Household Census of 2022 indicated that the population of Kasulu district was 537,767 out of which 276,835 were females and 260,932 males, while the annual growth rate stood at 2.4. Total number of households is 102,332 and the average household size in the district is 5.3. The larger number of household size in Kasulu district might be associated with influx of refugees from neighbouring countries. Such relatively high population growth rates in these districts could have major pressure on the land and create land use conflicts along the railway corridor. The population distribution for the project affected districts and wards are shown in **Table 5-17**.

Table 5-17. Population distribution in the project affected district and wards.

Districts	Wards	Population			Number of households	Average Household size
		Male	Female	Total		
Districts						
Kasulu		260,932	276,835	537,767	102,332	5.3
Wards						
Kasulu	Rungwe Mpya	9,576	10,292	19,868	4,036	4.9
Kasulu	Nyamnyusi	7,878	8,533	16,411	3,105	5.3
Kasulu	Nyakitonto	9,774	10,397	20,171	4,094	4.9
Kasulu	Buhoro	8,256	8,816	17,072	3,302	5.2
Kasulu	Heru Ushingo	17,942	18,689	36,631	7,927	4.6

Source: NBS, 2022 Tanzania Population and Housing Census, 2022

c) Social Services

✓ Education

There are 77 government primary schools in Kasulu District Council. Kasulu District has 7053 pupils in pre – primary schools and 78594 pupils in primary schools. Of these, 43216 are boys while 42431 are girls. The district has 18 Government Secondary Schools with a total number of 7002 students whereas 4115 are boys and 2887 are girls. There are 2 Non – Government Secondary Schools with 263 students of 122 boys and 141 girls). Thus, the total number of secondary school students is 7265.

✓ Health Facilities

Available health facilities are concentrated in urban centres. It is about 120 km from Kitanga Dispensary to Nyakitonto Health centre. Some of maternal complications Postponer haemorrhage and Eclampsia which need emergence intervention and yet the access to such service is difficult due to long distances patients must travel from villages to the health centre. Table 9 shows the type of facility, required and available facilities.

Table 5-18: Type and available health facilities in Kasulu district

Type of facility	Required	Available	Ownership	
			Government	Private
Hospitals	3	1	1	0
Health centres	7	8	7	1
Dispensary	53	34	33	1
Total	63	42	39	2

Source: Kasulu District Profile, 2019

✓ Water

Currently, 62.4% of the district population has access to clean, affordable, and safe water from various sources namely rivers, protected springs, shallow wells, borehole, spring and rainwater harvesting where gravity and solar technology are applied. So far, the district has six types of schemes as shown in **Table 5-19**

Table 5-19. Type of schemes in Kasulu district

Type of schemes	No of schemes	Functioning	Not functioning	New proposed projects
Gravity Water	22	19	1	4
Shallow wells	98	88	10	35
Bore hole	22	14	8	23
Protected springs	43	43	0	20
Rainwater harvesting	19	10	9	40
Solar system	3	2	0	7
Total	208	176	28	129

Source: Kasulu District Profile, 2019

✓ Road networks

In Kasulu District Council, TARURA has so far been maintaining gravel roads (146. km) and Earth roads (245 km) which make up a total of 391.3 km only. There are no tarmac roads. The Council is also involved in the maintenance of roads as shown in Table 5-20 **Error! Reference source not found.**

Table 5-20: Status of road network for Kasulu District council

Types of roads	Length (km)	Good condition (km)	Medium condition (km)	Bad condition (km)
Tarmac roads	0.00	0.00	0.00	0.00
Gravel roads	146.30	76.29	48.48	21.53
Earth roads	245.04	132.82	61.93	50.29
Total	391.34	201.11	110.41	71.82

Source: Kasulu District Profile, 2019

d) Economic Activities

✓ Agriculture

Agriculture is the major economic activity. About 90% of people are fully engaged in agriculture. Over 85% of the inhabitants depend on crop and animal husbandry and the remaining percentages depend on other sectors, such as beekeeping and petty businesses. The main food crops are maize, beans, cassava, sweet potatoes, banana and paddy. The main cash crops include coffee, tobacco and sugar cane. Currently, the land under cultivation is 137,525 (5,324 square kilometers) which is about 68.2% of the total arable land of 532,400 (5,324 Km²). The area under irrigation is 3,083 which is 18.5% of 16,668 ha suitable for total irrigation area. The cultivated 137,525 ha is for cash and food crops. The main cash crops grown are; coffee, ginger, cassava and cotton. Food crops include maize, beans, cassava and rice (See **Table 5-21**).

The district has a great potential for coffee production. TaCRI has played a significant role to promote production of coffee in Kasulu District through village-based training and promoting coffee production, over the past few years. Arabica coffee that is produced in the highlands of Kasulu specifically in Heru Juu, Karunga, Muhunga and Muganza, has proven to be the best in the international market.

Irrigation agriculture is practiced in Kasulu and Uvinza districts. Irrigation is mainly for paddy, horticultural crops, and maize during dry seasons. Irrigation for horticultural crops is mainly carried out along river valleys. In Kasulu district, irrigation agriculture is practiced in Titye, Lalambe, Nyenge & Migunga (Titye ward), Rungwe Mpya, Kaguruka, Nyumbigwa (Rungwe Mpya), Kabanga, Buhoro, Msambara, Kidyama and

Kanazi (Msambara ward). In Uvinza district irrigation is practiced in Kashagulu, Mgambazi, Nkonkwa and Machazo valleys. The proposed railway line traverse some of the villages with irrigation agriculture such as Rungwe Mpya, Kidyama and Buhoro in Kasulu district.

Table 5-21. Production of various crops in the year 2018/2019

Crop type	Ha	Tons
Banana	10628	167,387
Maize	16,568	33,136
Cassava	18,630	130,410
Sweet potatoes	238	1,190
Oil palm	172	138
Beans	12,927	15,512
Groundnuts	740	2,220
Pigeon peas	12,300	12,300
Tomatoes	672	2,688
Green peas	279	279

Source: Kasulu District Profile, 2019

✓ **Livestock keeping**

The district has a total area of 435,252 ha potential for grazing. Livestock infrastructures for improved livestock services in the district include 12 cattle dips owned by the district, 19 4 slaughter slabs, two cattle water troughs, and three primary livestock markets. Moreover, the unit ensures that, there is up to-date livestock data through conducting livestock census from all villages each year. The livestock population for the year 2018 is summarized in Table 15. Further, data from slaughterhouses and milk collection centers shows that, the beef meat produced in 2017/2018 Financial year was 110,000 kg, Pork meat produced was 28,000 kg, goat meat was 32040 kg, and sheep meat was 80kg. The total amount of milk produced was 98,035 litres; skins were 2,140 and 880 pieces of hides. Table 5-22**Error! Reference source not found. Error! Reference source not found.**shows the type and number of livestock in Kasulu district.

**Table 5-22: Type and number of livestock in Kasulu district
in 2018/2019**

Type	Indigenous	Dairy breed (improved)	Total
------	------------	---------------------------	-------

Cattle	143,137	83	143,220
Goats	115,051	0	115,051
Poultry	130,520	0	130,520
Sheep	49,216	0	49,216
Donkeys	183	0	183
Pigs	17,161	0	17,161

✓ **Fishing**

Fishing is practiced along river Malagarasi and other tributaries. Generally, Kasulu District Council has potential for aquaculture activities. Fisheries Unit in collaboration with other stakeholders such as Belgium Technical Cooperation and World Vision have facilitated and capacitated farmers to participate in fish farming activities. Currently, fish farming activities are conducted in Nyakitonto, Mugombe, Mvugwe, Heru Ushingo, Kagerankanda, Mvinza, Rungwempya, Nyamidaho, Kitagata and Mwali. A total of 900 households are involved in fish farming activities in groups and individually and it is estimated that about 52 tons produced and consumed domestically.

Livestock and Fisheries improvement in Kasulu District Council is affected by the following challenges: Inadequate financial and technical resources; low production and unreliable markets for livestock products; inadequate number and skilled personnel in livestock related field; low capacity of production, collection, processing and marketing of fishery products; insufficient regulatory frame work for animal health services; lack of good source of fish fingerlings; low level of technology adoption in fish farming; high 20 cost in aquacultural technology; limited awareness on potentials of aquaculture and limited availability of feeds and water resources.

✓ **Mining**

Kasulu District has a variety of minerals not yet extracted; according to the Regional Mining office survey report of year 2010, minerals found in Kasulu District includes:- Limestone found in large quantities in Makere wards and extraction is operational; Coal [Poor Coal-Lignite] is found at Nyakitonto ward but is not yet extracted; Agate, Opal and Amethyst are found near Kasulu but extraction has ceased; and Green Tourmaline at Bugaga ward which is not yet extracted. The mineral potentials that the districts have, has attracted several mining exploration companies such as INCO of Canada, Anglo-America, BHP Mineral Exploration, BILGEO of China, Goldstream Mining of Australia and Lonmin of United Kingdom.

5.3.5 Kasulu Town Council

Kasulu Town Council forms a part of Kigoma Region, the region that is situated at the extreme Western part of the Republic of Tanzania. Kasulu Town Council is a new Local Government Authority established on 1st July, 2011 through Parliamentary letter signed in Dodoma on 19th April, 2012 under the Local Government (Urban Authorities) ACT (Cap 288). Kasulu Town Council is located in western part of Tanzania in Kigoma Region between Longitude 29 0 06" and 30 0 55" East of prime Meridian and Latitude 3 0 45" and 4 0 34" South of the Equator. The major characteristic

of the Council is categorized into low lands and highlands of 1,200m -1,800m a.s.l and plateaus of 914m - 1,350m from the sea level.

5.3.5.1 Land Area and Land Use

The Kasulu Town Council covers an area of 878.8 km² and it is divided into 2 divisions, 15 wards and 108 Mitaa. Also, the Council has 1 election constituency namely Kasulu Town Constituency.

5.3.5.2 Population Size and Ethnicity

The 2022 population and housing Census recorded a total population of 238,321 comprising of 112,167 males (47.7%) and 126,154 females equals to (52.3%) in Kasulu Town, with the population growth rate of 2.4% per annum. Life expectancy is estimated to be 52 years. The current population density is 57 people per Square KM while each household carries 5.6 people by average. Also, the sex ratio is 91 meaning that there are 91 males per 100 females.

5.3.5.3 Social Services

✓ Health

Health services delivered in town is better compared to rural communities. This is mainly due to presence of good facilities in urban area as compared to rural area. Malaria has been a leading killer disease amounting 31,047 cases and 199 deaths, following by Neonatal Condition 376 cases and 85 deaths, PEM number of cases 400 and 71 deaths respectively. Others are AIDS/STI and TB. Children are most vulnerable group affected by these diseases. Table 5-23 justifies the above description:

Table 5-23: Distribution of Morbidity Cases 2015/2016

Diseases	Cases	Deaths
Malaria	31,047	199
UTI	21,676	2
Intestinal Worms	13,686	0
Pneumonia	6,572	11
Anemia	4,577	0
PEM	400	71
Neonatal Conditions	376	85
TB	130	14
Poisoning	92	5

✓ **Primary Education**

The Council has 68 primary school of which 60 are government owned while 8 primary schools are private owned. All 68 schools provide both pre-primary and primary education. In pre-primary education there are 5703 pupils in total of which 2889 are boys while girls are 2814. In primary schools there are 63,682 pupils of whom 31,267 are boys and 32,416 are girls. In primary schools there are 848 teaching staff which constituted by 412 male staff and 434 female staff. In executing its day-to-day responsibility, the department rely on ruling Party manifesto, Education and Training Policy and National Five years Plan. At the same time the National leaders" special speeches are observed.

✓ **Secondary Education**

Kasulu Town Council has a total of 34 secondary schools out of which 18 are owned by the government and 16 are private schools. Total number of students is 15,876 among them boys are 8,087 and 7,789 girls. Moreover, the government schools have 6,547 boys and 6,554 girls which make a total of 13,101 students. In Private schools there are 1,540 boys and 1,235 girls amounting to 2,775. Enrolment of selected Form I in Government schools, the first year of O- Level education, increased from 3,365 (99%) in 2020 to 3,563 (98.6%) in 2021 to 3,364 (70%) in 2022 Enrolment is in progress. Additionally, in the year 2022 all 4,821 students selected to join Public secondary education are expected to have access to that education. Enrolment of form I, has increased by 1,409 (70.77%) from the years 2020 to 2022 because of free education program introduced by the government.

✓ **Water Supply**

The Town Council through a water policy 2002 and NDV 2025 have strong strategies to make sure all population is accessible to clean and safe water by year 2025. It is estimated that 56.17% Of the total population in the Council is accessible to clean water within the required walking distance of 400 meters.

The Council has 11 Gravity piped schemes, 6 bore holes, 43 spring water scheme, 3 shallow wells and 8 rain water harvesting tanks. There are 208 sources of water not yet utilized this comprises 57 shallow wells, 74 spring water and 56 streams. All Water Projects have 633 water points out of them 346 water points are functional and 287 water points are Not Functional.

For the sustainability for Water supply Projects, the Council through the department of water Establishes and strengthen Water User entities and water Boards for undertaking Operation and Maintenance. Currently only one water Board exists and establishments for other water users' entities is on progress. Council also rehabilitates old infrastructure and makes replacement of the new ones.

The Coverage of the population by urban water supplies for the year 2015 is 56.17% while the total number of people covered with safe water supplies is 51,587 in 2015. As at 31 December 2015 Mtaa/street water committees were 16 and amount collected is 125,216. In Kasulu urban center total number of urban water schemes (working and not working) by the type and source of water and by the technology employed to get the water to customers for the year 2015 shows that there were 4 springs, 3 rain water that is roof catchments and 2 gravity piped

✓ **Electricity**

Currently the Council is not yet connected to national transmission grid. The Council has already electrified by thermal power so as to enable electric intensive investment. The Electric plant is now operating. The progressive works is to supply electrical line to users. The capacity of the plant is to supply 2.5MW at a time. Currently, there is ongoing establishment of Min-Hydropower at Mwoga falls at Heru-Juu ward 9km from Kasulu town centre. The program facilitated by Rural Energy Agency [REA]. The program is at the final feasibility study. The first study conducted in 2003 where by there is a promising success for the establishment of the project in a near future.

✓ **Road Infrastructure**

The Kasulu Town Council has a total road network of 294.55Km of which 203.5Km are earth roads, 90.05Km are gravel roads and 1.5km are tarmac roads. The situation indicates that 294.55 Km are earth roads and are averagely in fair condition. If comparison is made between total Kilometers of gravel roads (90.5Km) to total Kilometers of earth roads (203.5Km) one may admit that there is need to put more effort on constructing gravel roads together with tarmac roads and not earth roads, however, this will mean an increase in Road Fund budget.

Table 5-24: Main Roads passing in Kasulu Town Council

Route	Condition	Distance (Km)
Kasulu-Kibondo	Gravel Road	150
Kasulu - Manyovu	Gravel Road	56
Kasulu-Kigoma	Gravel Road	102
Kasulu-Uvinza	Gravel Road	78

- Total length of Kasulu Town Council roads is 293.55Km
- Total length in kilometers of constructed roads with tarmac surface is 2.5Km
- Total length in kilometers of constructed roads with gravel surface at Kasulu Town Council is 90.25Km
- Total length in kilometers of constructed roads with earth roads surface at Kasulu Town Council is 203.3Km

5.3.5.4 Economic Activities

Kasulu Town Council is a land for investment found in the North -Eastern part of Kigoma Region. It is a junction with linking roads to Kibondo, Uvinza and Buhigwe districts respectively. The people of Kasulu Town Council widening the markets through International business exchange with businessmen from the Republic of Burundi. The Council is having one warehouse buildings with capacity of storing 250 Tons of crops, warehouses are found in Kigondo Ward. The per capita income of each individual in the council is estimated toTshs.685, 000/= per annum.

✓ **Agriculture**

Agriculture is an activity mainly based on crop production; about 85% of the households in the Council are involved in crop production. Crop production is among the major sources of income generation for many households. The main crops grown in the area include maize, groundnuts, sunflower, cassava, sweet potatoes, beans, cowpea, onion and tomato. Crop production is predominant in Peri-urban wards. However, some urban households do also engage in agricultural activities, specifically gardening of horticultural crops.

Irrigation in Kasulu Town Council has been seen as protection against erratic rainfall and drought, it is an assurance against risks in crop production, increases volume of production and contributing to poverty reduction in the surrounding urban community by ensuring food security to household level. The only Irrigation Scheme is located at Msambara which is in North - East of Kasulu Town. The scheme is located 12 km from Kasulu town has 255 users out of them 58 are female and the rest are male. Irrigation beneficiaries are about 2,288 who mainly cultivate maize, irish potatoes, beans, horticultural crops, and banana during dry season. Horticulture cropping is mainly carried along river valleys. Paddy is among the focused crop in the Council. However, the construction of main canal at Msambara Irrigation scheme has reached 90%. There are other tasks which are still pending due to lack of funds.

Currently total arable land of the council is approximately 703 sq Km equivalent to 80% of the total Council area estimated to be 878.8 Km². Only 82% (72,306.5 Ha) is actually cultivated but total area for agriculture is subjected to change due to urban authorities' regulations.

Table 5-25: Major Crop Production in Tonnes for Kasulu Town Council

Crop type	Tons
Banana	2,520
Maize	88,210
Cassava	09,450
Sweet potatoes	4,520
Beans	4,391
Pigeon peas	85
Paddy	305
Garden peas	25

✓ **Livestock keeping**

Livestock keeping practiced in Kasulu Town Council is both traditional and commercial in nature. A large proportion of cattle, goats and sheep are indigenous dominated by pastoralists and agro- pastoralists. The Council has about 16,904 cattle, 18,997 goats, 3,014 sheep, 4,095 pigs, 2,094 dogs, 724 duck and 46,219 poultry.

Table 5-26: Estimated Livestock population in Kasulu Town (2015/16)

Livestock	Total
Cattle	16,904
Goats	18,997
Sheep	3,014
Rabbit	517
Pigs	4,095
Dogs	2,094
Duck	724
Poultry	46219

In 2015 the number distribution of dairy cattle stands at 397 owned by 156 livestock keepers. The Council is rich of cattle population due to favourable weather condition.³ Apart from increase of livestock production the constraints of diseases occurs for example Helminthiasis, ECF, Anaplasmosis, Lumpy Skin, Foot and mouth disease and Heart water. There are 11 dips in operational while only 5 are not working. The Council is on serious planning in controlling tsetse fly in cooperation with other stakeholders in the Council. However, the number and quality of the livestock kept has remained low compared to the high population growth of the Council and demand.

5.3.6 Buhigwe District

Buhigwe District Council was established in 2012 under the Government Notice No. 73 of 2nd march 2012. It is one of 7 councils of Kigoma Region, others districts include; Kibondo, Kigoma, Kigoma/Ujiji Municipal, Uvinza, Kasulu and Kakonko. It is located in the Western part of Kigoma Region. In the west, it is bordered by Republic of Burundi, in the East and northern part is bordered by Kasulu District Council, in the south-eastern is bordered by Congo DRC, in the southern part is bordered by Kigoma District Council. It is located in the highlands found nearby Republic of Burundi.

5.3.6.1 Land area and land uses

The district occupies an area of 1700.29 square kilometers, whereas; agricultural and livestock keeping are major land uses found in the district. Attractive landscapes such fertile soils and favorable climatic conditions for animal husbandry and agriculture. The district covers a total land of 150,325 hectares, of which 98,012 Ha are classified as suitable for agriculture and 27,058.5 Ha for livestock activities. About 22,248 ha are estimated for settlements and the rest, 3,006.5 ha are for others. However, A total of 1,277.796 sq Km or 84.9% of the District area is arable land, but only 50% is cultivated only, indicating that a large portion of land suitable for agriculture remains unutilized. Administratively, it is divided into 2 Divisions; 20 Wards, 44 Villages and 188 Sub-villages. Only one ward and one village, namely Mugeru ward and Katundu village are affected by the project.

5.3.6.2 Population Size and Ethnicity

Based on the 2022 National Population and Housing Census, the District has the total population of 240,005 out of which 112,684 are males, and 127,321 are females. The average annual growth rate is 2.4 percent and the number of households is 45,117 with an average household size of 5.3. The dominant ethnic group in the district is Waha accounting for more than 98% of the total population. Table 14 shows the population of Buhigwe district and the project affected ward.

Table 5-27: The population of Buhigwe district and Mugera ward in 2022

Districts	Wards	Population			Number of households	Average Household size
		Male	Female	Total		
Districts						
Buhigwe		112,684	127,321	240,005	45,117	5.3
Wards						
Buhigwe	Mugera	7,839	8,444	16,283	3,056	5.3

5.3.6.3 Social services

✓ Health and health infrastructure

Malaria has been a leading killer disease. Other includes; Anemia, Pneumonia, AIDS/STI and Diarrhea. Children are most vulnerable group affected by these diseases. The district has 2 Hospitals, one owned by Faith Based Organization and one under government control; 4 Health Centres, whereby 2 are owned by private, 2 by government and 30 Dispensaries. The presence of this service in rural and urban has decreased the Mother to Child mortality rate from 116/100,000 to 56/100,000 in year 2005 and 2010 respectively. HIV infection has decreased from 2% in since last year. This is a positive improvement but still more efforts are highly needed to increase efficient service especially in this sector.

✓ Water supply

The district doesn't have water policy already but is in the process of finalizing it and develop a strong strategy to make sure all the populations is accessible of clean and safe water by year 2025.

It is estimated that 62.67% of the total population in the District is accessible to clean water within the required walking distance of 400 meters

Table 5-28: Type of Water Schemes in Buhigwe District

Type of schemes	No of schemes	Functioning	Not functioning	Requirement
Gravity Water	23	18	5	7
Shallow wells	36	20	16	25
Protected springs	108	104	4	0
Rainwater harvesting	32	30	2	30
Total	199	172	27	62

✓ **Energy**

Over 90% of population in Buhigwe district depends on fuel wood energy for domestic cooking. This makes attention on the need for forest management and conservation. The district has set some mechanisms of selling opportunities available in energy area to various development partners. Solar energy is also used for lightning, however, the energy which generated by solar panels from sun rays is limited to few institution buildings belonging to government and to a very few individuals' premises. Fossil fuels such as diesel, oil, and petrol are used to energize transport and various commercial establishments. For the case of urban and rural population a significant proportion depends on kerosene for lighting rather than generator. Currently the district is also electrified by thermal power from Kasulu power station so as to enable electric intensive investment. The Kasulu Electric plant is now in operation, the remaining works is distribution of electric line to Buhigwe District. The capacity of the plant is to supply 2.5MW at a time.

5.3.6.4 Economic activities

✓ **Agriculture**

Total arable land is 1,277.796 sq Km or 84.9% of the total District area. Out of that, only 50% of the land is actually cultivated, therefore there is a wide room for expansion. The major farming mechanism in Buhigwe District is based on coffee-maize-bean-banana system in the highlands, maize-tobacco in the low lands and sugar cane and paddy along the river and water streams. Cash crops include Coffee, palm, Cotton, Tobacco, Ginger and Sugar cane while Maize, Cassava, Beans, Banana, Paddy are food crops. Coffee is the major source of income in the highlands and rolling hills area while maize and tobacco are the major sources of income in the lowland areas. Farming activities are being conducted by using traditional implements such as hand hoes and it is family labor based which results into low yield per area thus a need to invest in this sector. The district has 3,700 hac suitable for irrigation agriculture. Out of this area only 2.7% is being used. This indicates that irrigation agriculture has been not well articulated.

✓ **Livestock keeping**

Livestock keeping practiced in Buhigwe district is both traditional and commercial in nature. A large proportion of cattle, goats and sheep are indigenous dominated by pastoralists and agro-pastoralists. The District has about **29,665** cattle, **17,506** goats, **3,893** sheep, **852** pigs, **123,517** chicken and 9,220 ducks¹. The District is rich of cattle population due favorable whether condition as compared to other District in Kigoma Region.² The District is on serious planning in controlling tsetse fly in cooperation with other stakeholder within and outside the District.

✓ **Beekeeping**

With huge forestry reserve Buhigwe District Council has potential for Bee-keeping, as there are many nectar yielding tree species and flowery agricultural plants. Generally the productivity of beekeeping is not increasing the way it was supposed to be while the demand is very high domestically and internationally. May be this is due to the reason of being a newly formed district where more efforts of both development partners is needed to boost beekeeping.

✓ **Transport and Transportation**

Buhigwe District is a junction that link roads to Kigoma, Kasulu District, and Republic of Burundi. It has a total of 574 km of road³, out of which 30 km is trunk roads, 60 km is Regional Roads, 282 km is District Roads, and the remaining 202 km is feeder roads. Generally main regional road and truck road are passable throughout the year but feeder roads and District roads are traversed with difficulty during rain season.

5.3.7 Socio –Economic Characteristics of the Potential Affected Population

5.3.7.1 Demographic Characteristics

✓ **Age of the Heads of Household's**

The average age in the survey was 45 with a range of 22-80 years. The most likely age group of the head of households to be affected by the project is 20 – 33, 34– 43, 44 – 53, 54 – 63, and above 64 years of age. The age group from 20 to 63 years of age comprises of 88.1 percent of the head of household's are regarded as the working group. Among the working group, 18.6 percent of were between the age group of 20 – 33. This indicates a very active and productive age group of the head of household's will be potentially affected by the proposed project. According on Figure 5-10, there are a significant number of elderly people (11.9 percent) along the proposed project corridor who will also be affected by the project. This group is regarded as a vulnerable group and therefore may require special attention during the project implementation.

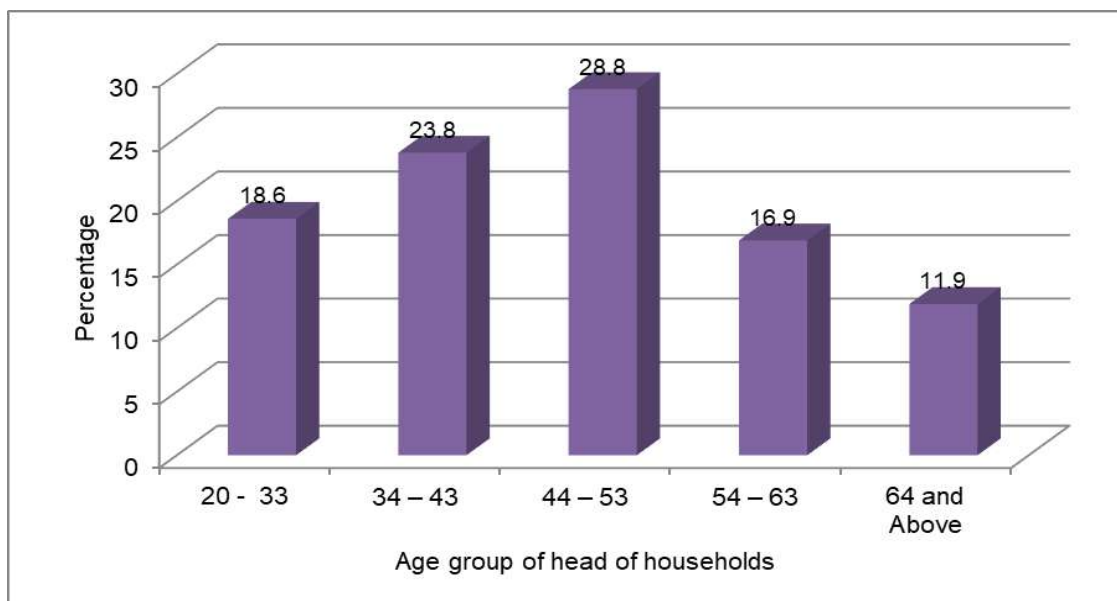


Figure 5-10: Percentage Distribution of the head of household's Age Group

Source: Field Survey, 2023

✓ **Average Household Size**

Based on the socio-economic survey as shown a total of 593 project Affected Persons (PAPs) were surveyed. The data analysis shows that the number of household members ranged from 1 to 15 members with an average household size of 2.4 household members. Based on the average household size, 1,434 household members are indirectly and directly affected by the project. The number of household sizes along the project area was classified into three groups as shown in Figure 5-11

Figure 5-11: Percentage distribution of household size and members in the project area

Household Size	Number of PAPs	Household Members (PAHs)	Percent
1 to 4	111	788	55.0
5 to 10	141	548	38.2
11 to 15	8	98	6.8
Total	593	1434	100.0

Source: RAP Household Census (2023)

✓ **Marital Status**

Marital status is a very important factor in determining how a person will be affected by land tenure. Widows are particularly vulnerable because land is generally controlled by men and upon the death of their husband's land is not considered theirs. Marital status in the proposed project area shows that majority of the head of households were married (83.1%), while (7.6%) were widowed, (4.2%) had divorced, (1.7%) were separated and the other (3.4%) were single as shown in **Figure 5-12**.

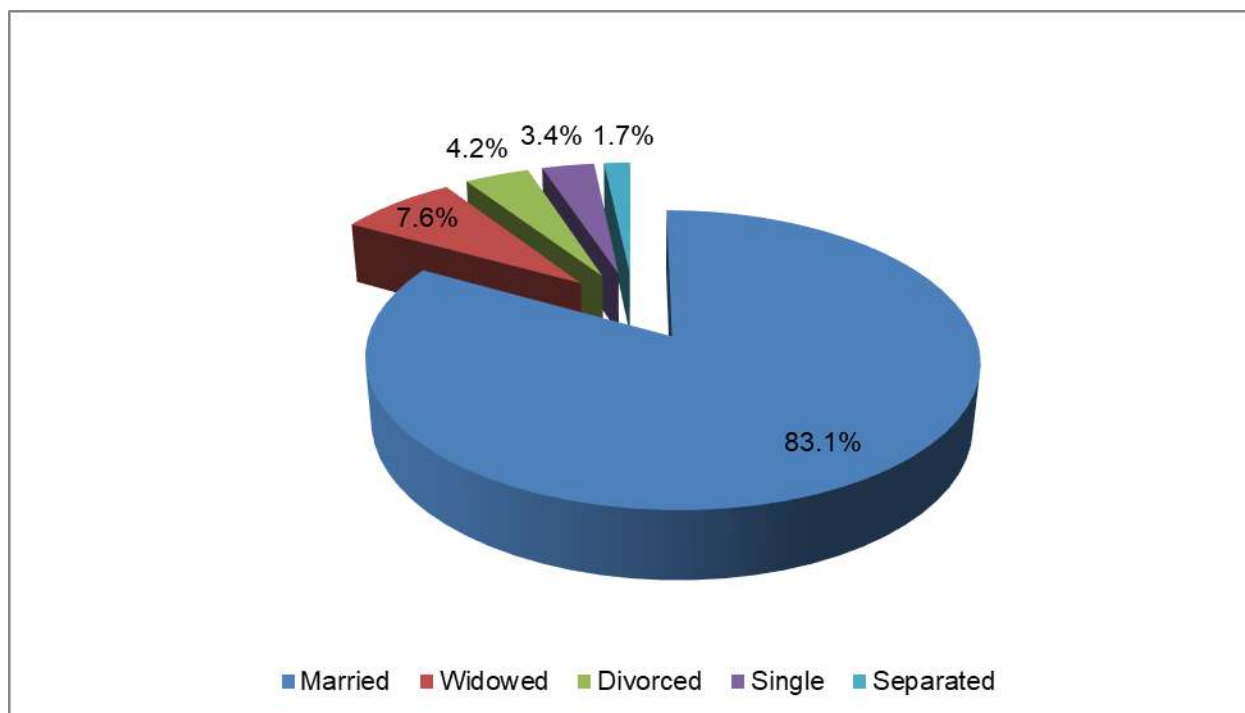


Figure 5-12: Percentage Distribution of Head of Household's Marital Status

Source: Field Survey, 2023

✓ ***Average household's size***

The overall average household size for the villages and mitaas along the proposed railway project is 5.2. According to the 2022 Population and Housing Census, the Kigoma regional household size was 5.2 while that of Uvinza, Kasulu and Buhigwe stood at 5.4, 5.3 and 5.3 respectively. This makes an average household size for the three districts to be 5.2. The reported national average household size for rural areas in Tanzania is about 5.0. Looking at the national average household size, it can generally be concluded that the overall average household sizes along the project is slightly higher than the national average. The percent distribution of household size along the proposed project areas is shown in Figure 5-13

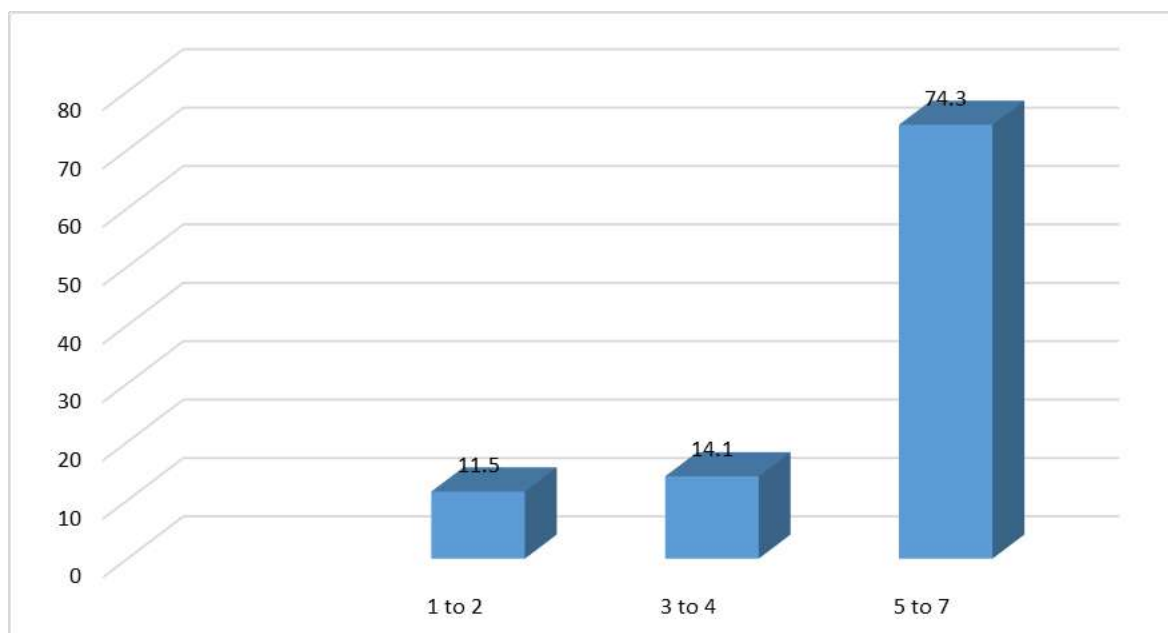


Figure 5-13: Percentage Distribution of Household Size

5.3.7.2 Household's economic activities

Figure 5-14 shows the percent distribution of respondent's major and secondary economic activities. Thus, involvement of high proportion of potentially project-affected people in farming activities means that significant adverse impact on farming activities and farmlands will have far reaching adverse social and economic consequences to affected communities.

Farming is the most important economic activity in the project area undertaken by 65.4 percent of the head of households. Livestock keeping is the second important economic activity undertaken by 22.7 percent of the household's heads. Small businesses such as shops, pharmacy for important drugs and selling of agricultural crops were reported to be primary and secondary economic activities by 9.3 and 38.5 percent respectively. Other economic activities such as masonry, carpentry, mud bricks making and motor cycle riders (Bodaboda) and were reported to be important secondary economic activities especially at Rungwe Mpya village where a number of youths are involved in the activity as shown in Photo 5-10, Photo 5-11 and Photo 5-12. The common crops grown in the project area include food crops (beans, cassava, sweet potatoes, banana, paddy, maize and some vegetables) that are mostly consumed within the village. Some of the food crops such as maize and beans are also used for commercial purpose especially in villages like Basanza, Sogeeni Kwiliba, Heru Ushingo, Nyakitonto and Buhoro where there are big farms for these agricultural crops. Sugarcane is also one of the important cash crops in many of the affected villages in Kasulu district. Figure 6, shows the percent distribution the head of household's primary and secondary activities in the project area.

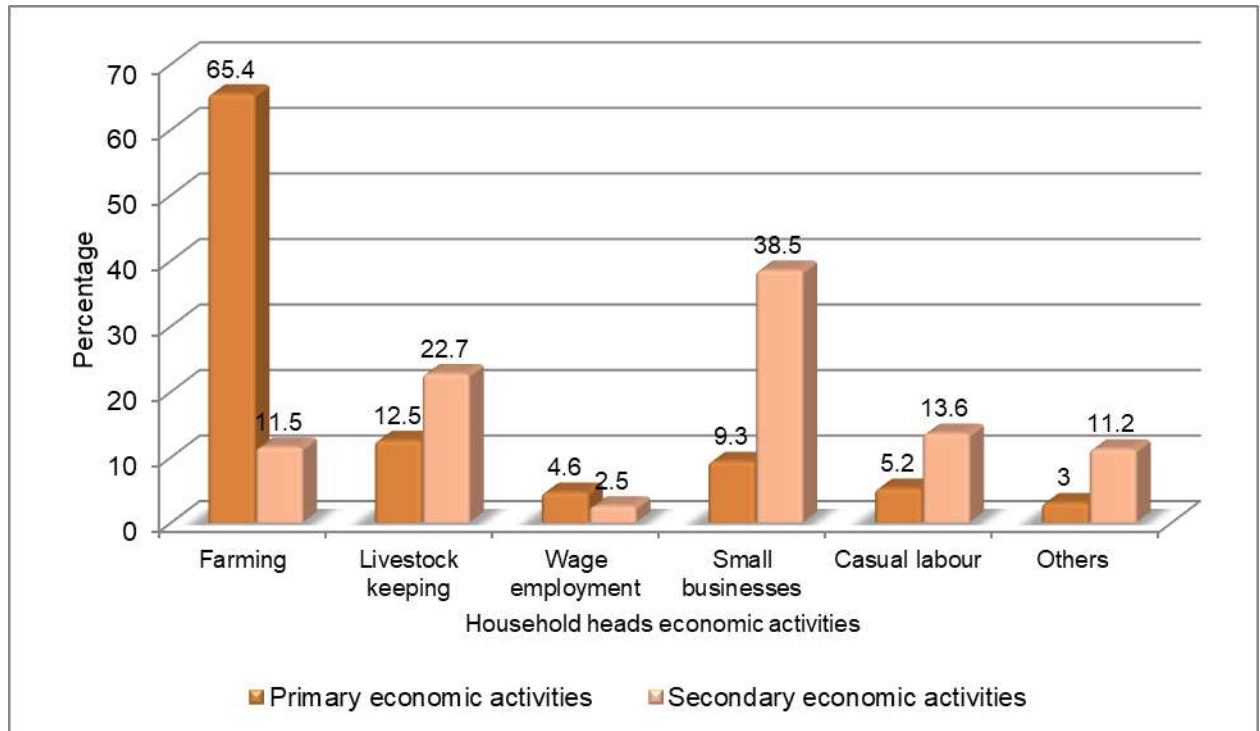


Figure 5-14 Percentage Distribution of head of household's economic activities

Source: Field Survey, 2023



Photo 5-10: Agricultural activities along the proposed railway project

Source: Field Survey, 2023



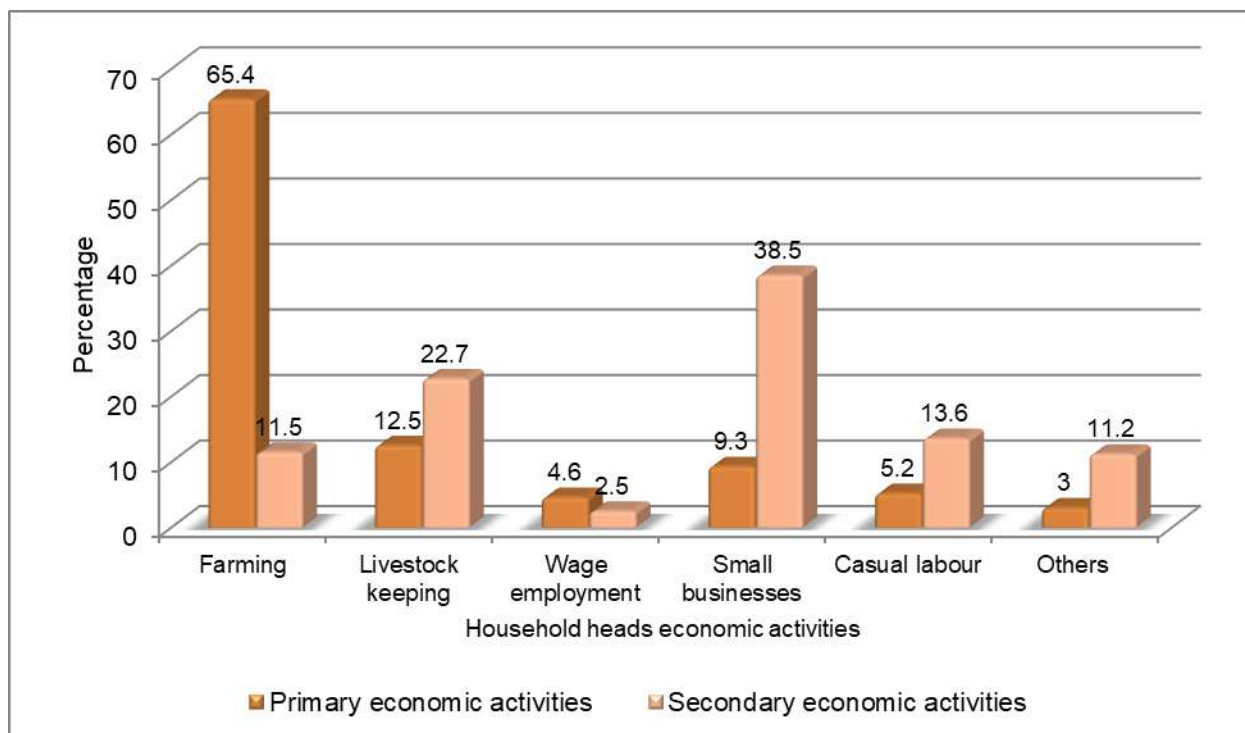
**Photo 5-11: Agro-business activities along the proposed Railway line
at Nyakitonto village in Kasulu**

Source: Field Survey, 202



**Photo 5-12: Some of the economic activities in Nyakitonto and Basanza
villages in Kasulu and Uvinza districts**

Source: Field survey 2023



Next to farming, people engage in livestock keeping which accounts for 32.22.7 percent of the households. The number of livestock kept ranging from 1 to more than 20 livestock, particularly cattle, goats and sheeps., majority significant number of heads of households 33 percent reported to have a number of livestock ranging from 1 to 10 livestock as shown in **Figure 5-15**. Wage employment, petty trade and casual labourer such as bricks making also forms an important economic undertaking in the area.

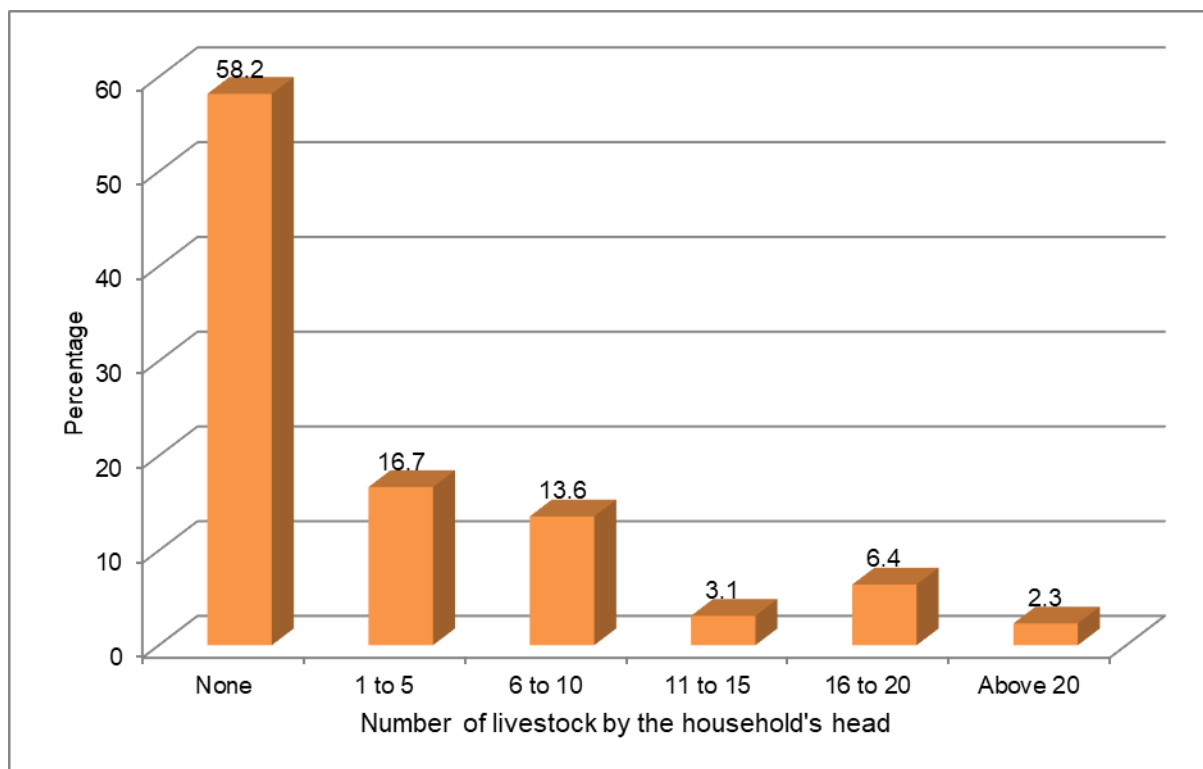


Figure 5-15: Percentage Distribution of Household's heads number of cattle

Source: Field Survey, 2023

5.3.7.3 Educational attainment for household heads

The levels of education of household heads and household members are shown in Figures 8. The assessment results show that more than half (62.5 percent) of the interviewed heads of households have attained basic primary education and about 9.7 percent have attained secondary education. In addition, there is a significant number (16.7 percent) of heads of households who have not attained any formal education. There is also a significant number of the head of households 6.4 percent who dropped out from primary schools.

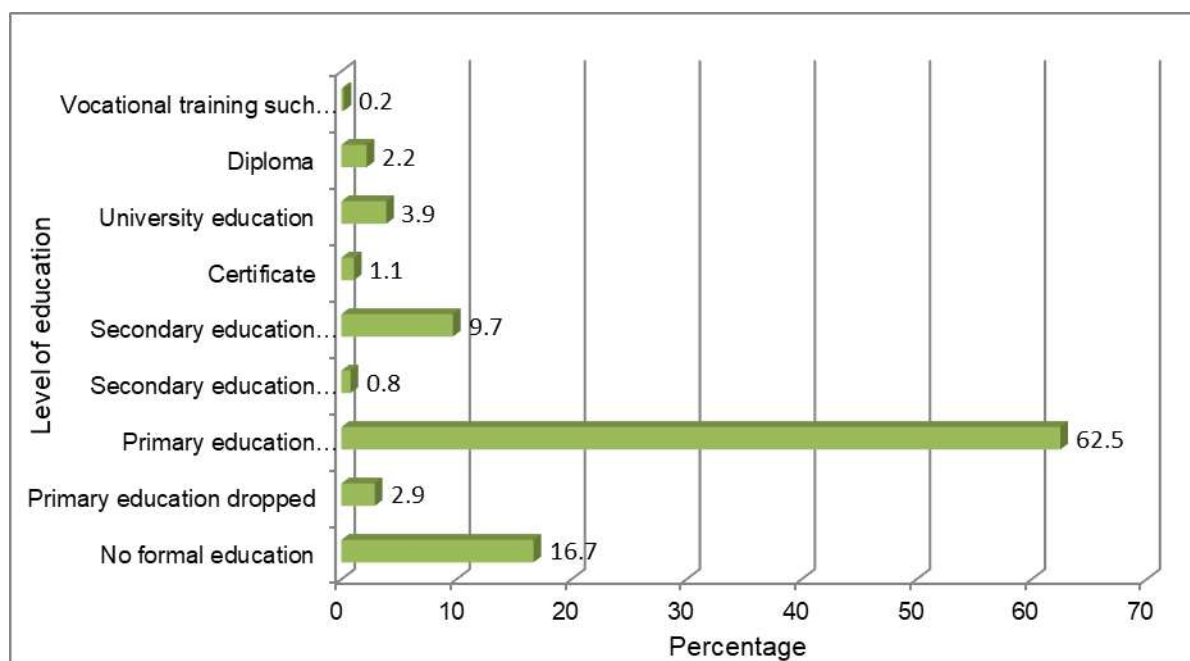


Figure 5-16: Percentage Distribution of Household's Level of Education

Source: Field Survey, 2023

The significant number of respondents who have not attained any formal education and presence of drop – out in primary schools might be associated with pupils' involvement in socio-economic activities such as farming to support their parents to improve household's income. In some villages the schools are located too far from residential areas and therefore discourage the pupils from attending schools.

5.3.7.4 Average annual household's income

Considering that agriculture is the major economic activity in the project affected areas, income derived from this activity is relatively important to these households. Food and cash crops as well as seasonal and permanent crops are sources of income. It was noted that seasonal crops which are mostly categorized as food crops such as maize, beans, paddy provide more income to the locals compared to crops identified as cash crops such as sunflower. Based on Figure 5-17, close to 88.2% of the household's head in the surveyed project area earn from less than 50,000 to the maximum of 250,000 per month, with observed decreasing number of earns going up the pyramid. About 17.6 percent of the household's head earn less than 50,000/= per month, while 32.2 percent their monthly income ranges from 51,000 – 100,000. In addition, 17.2 percent earn between 101,000 – 150,000 while 21.2 percent of the surveyed head of households earn between 151,000 – 250,000/=. Furthermore, 6.0 reported to earn about 251,000 – 500,000, 3.7 percent earn between 501,000 and 1,000,000 and only 2.1 percent reported to earn more than one million TZS.

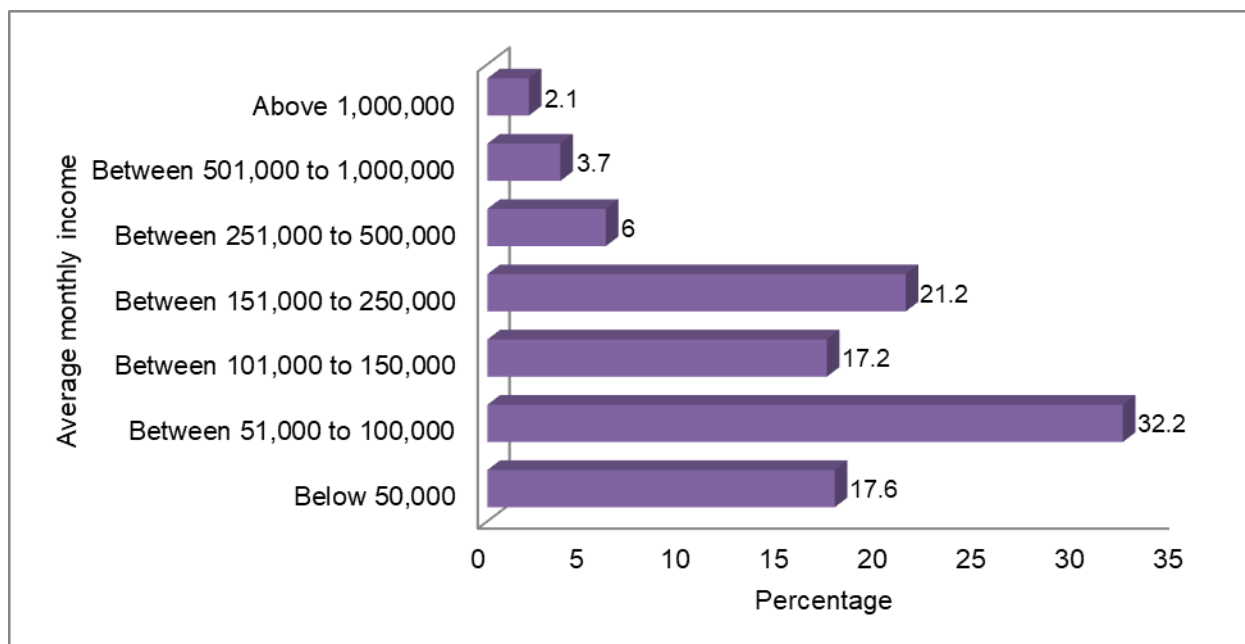


Figure 5-17: Household's head average monthly income

Source: ESIA Filed Survey, 2023

From these figures, it is evident that the households in the project area face significant socio-economic challenges. The creation of additional employment opportunities can therefore be seen as a significant positive impact on the surrounding communities, even though some of these opportunities may only be of a temporary nature. During the household survey, the issue regarding creation of employment opportunities was most frequently mentioned in the area. There is a widespread high expectation that Uvinza – Kigadye SGR project should provide employment opportunities to the residents in the local area that will provide employment to the local people, hence increase their income.

5.3.7.5 Land Use and tenure

There are three main types of land use along the proposed project corridor. The larger part of the area is used for farming activities followed by the land used for grazing and human settlements. There is Basanza Forest Reserve and social infrastructure such roads and paths existing along the proposed project. Agriculture consisting mostly of the production of food crops like maize, maize, beans, sweet potatoes, peas, cassava etc, are partly for subsistence use and some are sold, and livestock rearing. Animals kept include goats, sheep, pigs and chickens. For commercial value, cattle are a viable enterprise, followed by goats. They are kept on a free-ranging basis. The land tenure system comprises mainly customary tenure. Inheritance and purchases are the most common modes of land acquisition along the proposed project.

5.3.7.6 Source of drinking water

Despite having various sources of water in the district such as rivers, boreholes and communal pipes, access to safe and clean water is still a challenge in the proposed project area. Most rural people are forced to use unsafe drinking water obtained from

rivers and unprotected wells. This has a significant implication to the health of the people in the area. Within these household, it was revealed that source of water along the project area mainly from communal stand pipe 33.9 percent as well as wells 20.3 percent while 15.1 percent comes from rivers and streams. Pipes from with is the house accounted for 4.2 percent of the head of households and boreholes are used by 8.5 percent. .

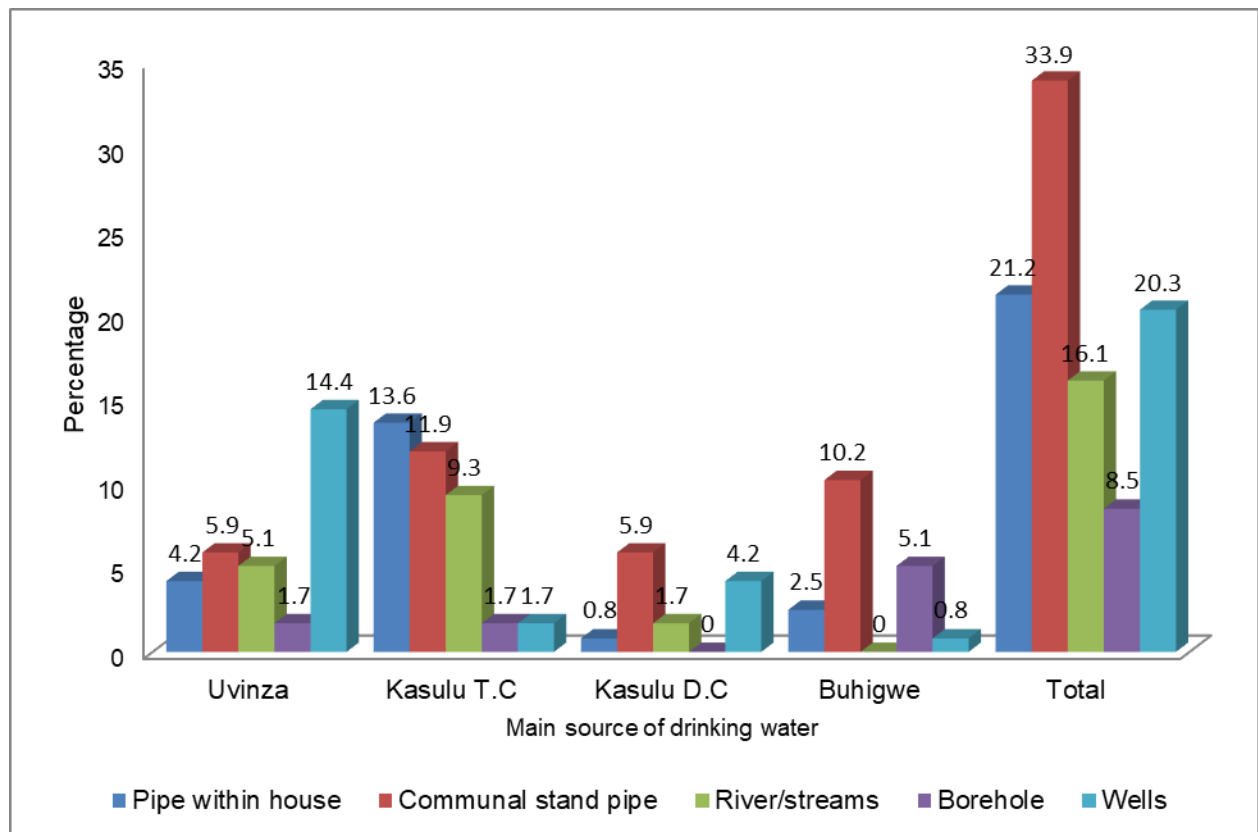


Figure 5-18: Major source of drinking water along the project area

Source: ESIA Field survey, 2023

Based on field assessment, water is obtained relatively close to residential areas at an average of about 500metres. Some of these sources such as rivers will be also be used during the construction of the project. Photo 5-13 shows one of the major source of drinking water in the project area.



Photo 5-13: Communal stand pipe at Lugoma village in Kasulu district

Source; ESIA Field Survey, 2023 Source of energy for cooking and lightining

Wood fuel (fuel wood and charcoal) is the dominant energy source for majority (approximately, 99%) of the potential project affected people who use the energy for cooking and other domestic purposes. This is because it is the only energy source which is easily available, relatively cheaper and constantly supplied throughout the year as compared to other commercial energy sources such as kerosene, lignified petroleum gas, solar power which are not promising since they are not easily available, more expensive and not constantly supplied/accessible to majority. Electricity and solar energy are mainly used for lightning. The major types of energy and their utilization in the project affected villages are shown in **Table 5-29**:

Table 5-29: Types and energy utilization in the project affected villages/mtaax

Type of energy	Percentage of users
Electricity	5
Fuel wood	30
Fuel wood and kerosene	60
Bio-gas	2.8
Solar power	2.2
Total	100

Source: ESIA Field survey, 2023

High dependence of wood fuel is a major source of energy implies that a large number of natural forests are exploited and hence cause high environmental degradation through deforestation. Since the implementation of project will require clearance of land for the railway alignment, stations, access roads, camp sites, borrow pits and dumping sites, it is likely that the rate of deforestation will be expected.

5.3.7.7 Availability and Distance to Social Services

Social services such as schools (primary and secondary), shops, market place, bus stops and health services are currently available in all the the project affected villages and mtaa. It was noted depending on the size and population of the villages some villages have more than two primary schools. Secondary schools are limited at ward level and therefore students from some of the affected villages are compelled to travel long distance to access the schools. Health centers, dispensaries and hospitas both private and public are available in different location of the project. The average distance to social services are estimated to be from 100m to 2000m depending on the location of the social services in the villages/mtaa. Some of the social services along the project area are shown in Photo 5-14.



**Photo 5-14: Health centre and dispensary at Nyakitonto and Ruhita villages
in Kasulu district and Town Kasulu Town Council**

Source: ESIA Field Survey, 2023

It should however be noted that some of these services will be affected by the project and will have to be compensated prior to demolishing. Similarly, some of these services might be available but not in the village but within the ward. For example, in Kigadye villagers depend on Heru Ushingo Secondary school while the health centre at Nyakitonto is used by about three villages; therefore, the relocation of such facilities should be strategic to ensure no impact to other current users.

5.3.7.8 Migration

From the household survey it was found that most respondents (61.4 percent) were born within the villages. About 20.7 percent reported that were born outside the village but within the district, 17.8 percent were born outside the villages and district but within the region. There were very few respondent's 3.1 percent who were born outside the region. Fig. 10 show the place of birth among the respondents.

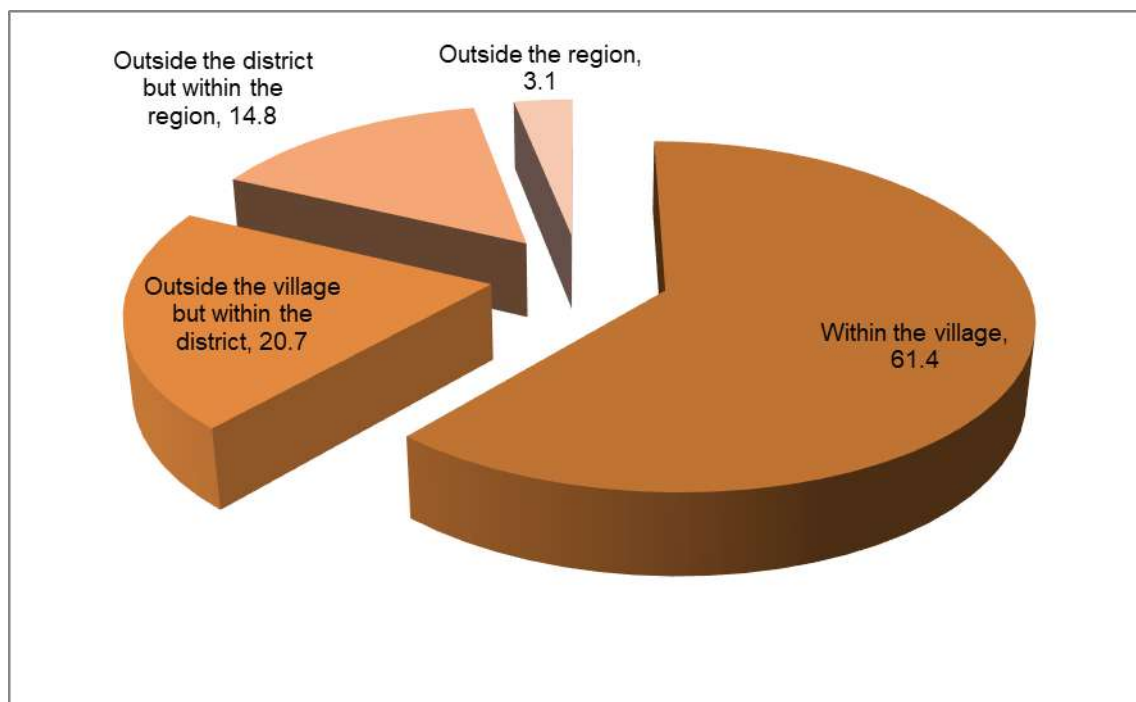


Figure 5-19: Percentage Distribution of Household's Place of Birth

Source: Field Survey, 2016

This result shows that there is a significant movement of people from one village or districts within the project area. The implementation of the project is likely to attract many people from within and outside the country and therefore, the issue of social services availability such health and water will be critical, especially during the construction phase. In a situation where some migrants may decide to establish permanent settlements in the villages along the project area, and availability and conflicts are expected particularly in towns of Kasulu and Uvinza where there is concentration of settlements and reported cases of land conflicts in some the villages and mtaa.

5.3.7.9 Gender Context

Gender equality is a human right issue. Women are entitled to live with dignity and with freedom from want and from fear. Gender equality is also a precondition for advancing development and reducing poverty: Empowered women contribute to the health and productivity of whole families and communities, and they improve prospects for the next generation. Infrastructure development such as the proposed SGR railway between Uvinza and Kigadye has both positive and negative impacts on many different communities. The project may impact various segments of communities differently, especially women. For instance, women are rarely represented in public participation processes for infrastructure projects that significantly impact their access to livelihood, social services including healthcare and education for the children, and protection against gender-based violence (GBV) and violence against children (VAC).

✓ **Access to and control of Resources**

Women's right to own and inherit land is among key issues pertaining to women's economic empowerment. In rural areas, many women's livelihoods depend almost entirely on their land. While women have the same rights as men, under Tanzanians law, to own and control land, women rarely buy land (UNA Tanzania, 2017). Customary practices in Tanzania often require women to access land through their fathers, brothers, husbands, or other men). Only 24% of Tanzanian women report that they own land alone or jointly with someone, while a mere 9% of women have sole ownership of a house or land (Tanzania National Bureau of Statistics, 2016). Only about 15% of Tanzania's privately-owned land is under sole female ownership, while 47% is owned by men and 38% is under joint male-female ownership (World Bank, 2013). Since the proposed infrastructure development project will acquire land, it is likely that women will greatly be impacted by the project. The baseline for RAP of the Uvinza-Kigadye railway project revealed that 7.6% of the PAP are widows. Considering also that 60.2% of the PAP don't have any form of land ownership document reveals the risk confronting women from the project.

✓ **Gender Based Violence in the project area**

Consulted stakeholders were concerned with the gender-based violence cases such as sexual harassment, teenage marriages and pregnancies, and child labor in campsites and during the recruitment of workers. Stakeholders believed that Women will be in vulnerable conditions in campsite work as camp workers or during the time of searching for job opportunities in the project. This concern was common in every village meeting when the ESIA study consulted the village members. Another related gender issue is HIV spreading. Stakeholders were engaged, and both men and women raised this issue due to the influx of people with different cultural and health backgrounds brought by the project may escalate the spread. And their concern, women are more exposed to this disease. Because even with the current prevalence, women are leading with people living with HIV and men follow.

Statistics from Kasulu District revealed a high rate of GBV, and Violence Against Children (VAC) with up to 301 cases in the period between January and March 2023 as summarized on Table 5-30. This requiring stern measures by the project implementer and contractor to averse such tendencies in the course of implementation.

Table 5-30: Cases of GBV and VAC in Kasulu District January- March 2023

Nature of GBV and VAC	GBV			VAC			Total
	M	F	Total	M	F	Total	
Sexual	0	6	6	7	25	32	38
Physical	3	42	45	4	9	13	58
Emotional	10	72	82	5	10	15	97
Abandonment	0	0	0	40	59	99	99
Child Labor	0	0	0	0	1	1	1
Illegal Human Trafficking	0	0	0	0	8	8	8

Nature of GBV and VAC	GBV			VAC			Total
	M	F	Total	M	F	Total	
total	13	120	133	56	112	168	301

Stakeholders from Civil Society organization and service providers for healthcare and community development offered to collaborate with the railway project team on the joint efforts to mitigate and monitor the challenge of GBV and VAC. This include supporting the existing efforts to establish several GBV one stop centers and related services in the most affected areas.

Also, from village meetings in the SGR line, stakeholders particularly women are concerned about the loss of ecosystem services like water sources and fuelwood due to the site clearance and disturbance of natural resources. Women raised their worry of loss of water sources and fuelwood because socially this is their duty of fetching and supplying water and fuelwood within the household. Another related gender issue of fetching water and collecting fuelwood was crossing. Stakeholders were so concerned with crossing because, need to access another side of the SGR line, basically women and girls for fetching water and collecting fuelwood.

✓ **Vulnerability and Vulnerable Groups**

As per the AfDB's Operational Safeguards, Vulnerability in the project area is determined through the likelihood of facing harder conditions as a result of the project, owing to such factors as gender, economic status, ethnicity, religion, cultural behavior, sexual orientation, language or health condition. Across the Uvinza-Kigadye railway project, the identified community vulnerable groups include female-headed households, those below the poverty line; the landless, orphans and homeless children, marginalized social groups and indigenous peoples. Others include PAPs without legal title to assets; ethnic, religious and linguistic minorities; and those who are physically handicapped. This group also involves cases of migration and immigrants particularly from the neighboring country of Congo DRC in the recent years.

5.4 Grievance Redress Mechanism

5.4.1 Introduction

The AfDB requires the establishment of a credible, independent and empowered local grievance and redress mechanism to receive facilitate and follow up on the resolution of affected people's grievances and concerns about the environmental and social performance of the project. The local grievance mechanism needs to be accessible to the stakeholders at all times during the project cycle, and all responses to grievances are recorded and included in project supervision formats and reports.

During implementation of the Project, there might be several issues related to environmental and social hazards and disputes on entitlement processes will occur due to the Project activities. For example, intensive schedule of construction activities; inappropriate timing of construction vehicle flow; waste; noise and air pollution from construction activities; ecological disturbances; cultural conflicts

between migrant workers, are some of the environmental and social issues that are likely to arise from the Project activities. A Grievance Redress mechanism have been set up for the Project to deal with both the environmental and social issues of the Project. TRC recognizes the vital importance of having a clearly planned grievance redress mechanism that will sustain positive relations with affected communities as well as help to ensure the satisfaction of individuals with regards to the resettlement process. This in turn will support the smooth and timely completion of the Standard Gauge Railway Project.

Based on this understanding, a Grievance Redress Committee (GRC) will be established. The GRC will be officially recognized 'non-judicial community-based body that will seek to resolved non-judicial disputes arising out of various matters related to the implementation of ESMP and RAP. The fundamental objective of GRC is to resolve any environmental and resettlement related grievances locally in consultation with the aggrieved party to facilitate smooth implementation of the ESMP and RAP.

5.4.2 Grievance Mechanism for Environmental and Social Issues

The following are some of the environmental and social issues that could be subject for grievances from the affected people, concerned public and NGOs

- Dust, noise and air pollution from construction activities
- Nuisance
- Intensive schedule of construction activities
- Inappropriate timing of construction vehicle flow
- Traffic movement
- Water pollution
- Waste disposal
- Disturbances to flora and fauna
- Impacts on protected areas and cultural sites
- Health and safety
- Criminal activities
- Failure to comply with standards or legal obligations
- Unauthorized use of private land
- Maintenance of access roads used by the project
- Request for additional access from the local community (box culvert, overpass)

Grievance Redress Procedures

Consistent with international standards, TRC's GRM includes the following five-step procedure:

Step 1: Receipt and Registration

Step 2: Classification and Prioritization

- Step 3: Investigation
- Step 4: Resolution and Feedback
- Step 5: Monitoring and Evaluation

5.4.3 Receipt and Registration

Complainants may submit a grievance verbally or in writing via the Project Grievance Form to their respective village chairman or local authority. Where feasible, the chairman/authority may resolve the grievance according to customary rules/procedures. Where the chairman/authority is unable to find a satisfactory solution, he/she may refer the grievance to authorities within TRC Environmental and Social Team. The GRC will be responsible for receiving unresolved grievances as well as compiling newly registered grievances on a weekly basis. Compiled grievances will be monitored in a grievance database that will be developed by the Project and managed by a designated TRC database analyst.

Complainants may bypass local authorities and register their grievance directly with members of the RSC, TRC/Contractor, Community Liason Officer (CLO), or by any other submission channel established by the Project. Where grievances cannot be addressed by the Grievance Redress Committee, they will be escalated to the ES Committee, or in the case of valuation grievances, the office of the Chief Government Valuer. Should these avenues not provide an acceptable solution, a grievance should only then be referred to the external mechanism of judicial proceedings. All aggrieved parties will be given the option to remain anonymous throughout the GRM.

The receiving party will record the grievance in an official logbook as well as acknowledge the grievance upon receipt or within a five-day period. Receiving parties will communicate to the complainant the remaining steps within the GRM and any relevant timelines.

Table 5-31: Stakeholder options for filling grievance

TRC recognizes the need for grievance filing procedures to be easily accessible and culturally appropriate for stakeholders regardless of education levels, gender, or other access issues.

Within this context, the following channels have been established for registering a grievance:

- *Written communication* via Project Grievance Forms and/or Suggestions/Feedback Boxes available in impacted villages and rail stations along the Project corridor;
- *Verbal communication* in-person or via telephone to village representatives, PRSC members, CLOs, or other TRC/ contractor staff at constructions sites/camps;
- *Via toll-free Project hotline* (0800-110-042) monitored by two designated TRC personnel.

✓ **Prioritization**

Grievances that have not been resolved at the local level will be classified and prioritised by the TRC/ contractor. CLO team with support from the TRC Social Expert. The TRC Social Expert will support the CLO team to determine the potential social risk, and subsequent steps for investigation. This may require reviewing records of similar incidents or occurrences, any available evidence, supporting documents, or statements.

Table 5-32: Proposed grievance classifications

No.	Classification
Category 1	Safeguards, including compensation disputes, land allocation and delays in compensation
Category 2	Grievances regarding violations of policies, guidelines and procedures such as Land policies of Tanzania, regulations and misconducts.
Category 3	Grievances regarding contract violations. E.g. Between village authorities and the contractor on the lease of borrow pits. Private land lease for camp constructions etc.
Category 4	Grievances regarding abuse of power/intervention by project or government officials
Category 5	Grievances regarding construction misconducts/violation of safety and precautions by the construction personnel.
Category 6	Grievances on sexual abuse/harassment and misconducts by any project related persons
Category 7	Suggestions
Category 8	Appreciation

Based on the circumstances of the complaint, the grievance will be forwarded to relevant authority or Project department for a proposed resolution. Following the finalization of this RAP, all resettlement related grievances (Categories 1, 2 and 3) will be immediately forwarded to the Social Safeguards Manager⁴⁴ for review and resolution.

✓ **Investigation**

The resolution of a grievance may require additional information to clarify the situation and/or improve communication between the complainant and TRC/contractor. In addition, it may be necessary to introduce mitigation measures to prevent the problem from recurring in the future. Where these cases occur, CLOs will organise telephone or face-to-face meetings to investigate the complainant's allegations as well as verify the validity and/or gravity of the grievance. If the grievance relates to a specific site or location, the CLO will organise a site inspection. The CLO will gather supporting information to identify corrective or

preventive measures to properly address the grievance including photographs and/or other documentary evidence.

✓ **Feedback**

At the completion of investigations, the CLO will draft a formal communication to the complainant detailing the investigation findings as well as any proposed response. The CLO will communicate the response, discuss any mutual commitments, and ask for the complainants' agreement. If the complainant is not satisfied with the resolution, or the outcome of the agreed corrective actions, the response should be reviewed and (if appropriate) amended in light of further discussion/negotiation.

Formal responses will include:

- i. Compilation of photos or other documentation of the grievance;
- ii. A record of the date and time the resolution was presented, a summary of corrective actions, and the signature of responsible Project staff;
- iii. A record of the meeting with the complainant to form a collective agreement closing out the claim; and
- iv. Where issues are resolved to the satisfaction of the complainants, a confirmation of agreement that will be filed along with the case documentation and the grievance will be closed.

Grievance resolution should be provided to complainants within 15 days of receipt of the initial grievance. If more time is required, this will be communicated clearly in advance to the concerned party. Where the complainant is satisfied with the response provided to their grievance, the CLO will close-out the grievance in the grievance database. If the complainant is not satisfied with the resolution or the outcome of the agreed corrective actions, the issue may be escalated to the ES Committee by the TRC Social Expert for further review and additional corrective actions. The aggrieved party will also retain the right at any point throughout the GRM to appeal to judicial recourse. Any party resorting to a court of law will be exempt from all administrative and legal fees pursuant to the grievance redress procedures.

✓ **Evaluation**

All correspondence and corrective actions will be tracked in the grievance database. Reports from the grievance database including resolution and feedback will be discussed on a monthly basis by the Joint Task Force. Discussions will revolve around the effectiveness of the GRM as well as any common or recurrent issues that may indicate the need for structural changes in Project activities. GRM results may be reported back to the community as well as any changes made to the GRM process via village meetings.

CHAPTER SIX

6 STAKEHOLDER IDENTIFICATION AND PARTICIPATION

6.1 Stakeholders Identification

The range of potential stakeholders to ESIA greatly depends on the definition of boundaries for that ESIA project but it is important to be 'inclusive' rather than 'exclusive'. The Constitution of the United Republic of Tanzania of 1984 Act No. 15 Art. 6 as amended in the Act No. 34 of 1994 Art.4 puts in front Freedom to participate in public affairs. It emphasizes that every citizen has the right and the freedom to participate fully in the process leading to the decision on matters affecting him, his well-being or the nation. Also, section 89 of the Environmental Management Act Cap 191, provides directives on public participation issues. Section 17 of the EIA and Audit Regulations (URT, 2005) provides further details and procedures for public participation in the ESIA process. Furthermore, AfDB's Operational Safeguard 1 on Environmental and Social Assessment stresses on the need to Provide for stakeholders' participation during the consultation process so that affected communities and stakeholders have timely access to information in suitable forms about Bank operations, and are consulted meaningfully about issues that may affect them. While preparing for stakeholders' consultation, the following activities were undertaken:

- Preparation of Stakeholders Engagement Plan (SEP)
- Stakeholder identification and analysis.
- Determine the type of consultation activities to be undertaken with each category of stakeholders.
- Information disclosure, specifically the provision of timely and meaningful information that is accessible to all stakeholders.
- Prepare the approach to and mechanisms for obtaining stakeholder feedback on the information disclosed.
- Prepare principles and ground rules guiding consultation with local communities; and the program for consultation to ensure timely notification of consultation activities and to tie in with key stages in the EIA process.

Stakeholders in the EIA process can be categorized in various ways including primary, secondary, or key. Primary stakeholders for example, are those who gain or lose materially from the project or who make direct contribution of resources or services to the project. Key stakeholders on the other hand are those who have significant power or influence to determine the direction and outcome of the project. This section outlines a range of key and primary stakeholders consulted during the scoping and ESIA process for the proposed development.

For the proposed development of a railway from Uvinza to Kigadye stakeholders included the government Ministries, Institutions, Region, Districts, Wards/Mtaa and villages communities along the proposed railway line. This included districts that the

proposed railway alignment will go through as well as local communities (at village and individual level) within these districts. Others are the targeted beneficiaries of the proposed project such as industries (Uvinza Salt Industry and other proposed development activities in Kasulu, Uvinza and Kibondo Districts as well as Kigoma Region at large), large scale farmers, passenger and cargo transporters, and other businesses that are likely to utilize the Railway as their means of transport.

6.1.1 Identified Stakeholders

Institutional Stakeholders

- Kigoma Regional Secretariat
- Uvinza District Council
- Kasulu Town Council
- Kasulu District Council
- Buhigwe District Council
- Wards and Village Offices

It should be noted that in each district, various relevant Officials were consulted, including District Commissioners, District Executive Directors, District Land Officers, District Natural Resource Officers, District Land Officers, District Environmental Officers, as well as the offices of the District Engineer and District Community Development Officers.

Ministry level

- Ministry of Works and Transport (MoWT)
- Ministry of Finance and Planning (MoFP)

Government Parastatals

- Tanzania Railways Corporation (TRC)
- TANROADS HQ Office
- TANROADS Kigoma Regional office
- TARURA District offices
- TANESCO District Office
- RUWASA District Offices
- Tanzania Forest Service Agency
- Lake Tanganyika Water Basin Authority

Private/Local Parastatals

Various NGOs and CBOs such as

- Tanzania Track Owners Association (TATO A)
- Kikundi Cha Maarifa na Taarifa Kasulu (GBV-NGO)
- Endeleva Wazee Kigoma (EWAKI)
- Tanzania Chamber of Commerce, Industry and Agriculture (TCCIA) College and Institute Canada

Individual stakeholders

- Local communities within the project area

The stakeholder consultation has helped to gather more information about the existing and planned infrastructures of roads, water and power supply, biodiversity conservation, truck business projectiles, PAPs, social economic status, vulnerable groups, Gender Based Violence cases, Health Status, Environmental status and Land use plans within the areas of the proposed alignment for Uvinza-Kigadye SGR line.

Other stakeholders

The affected Institutions were also consulted both the direct and indirect impacted institutions which are close to/crossing the proposed alignment such as Tanzania Forest Services Agency (TFS) De Paul Mission School at 500m, Ruchugi Secondary School at 980m, Katundu Secondary School at 250m. Consultations were also conducted with individuals working with NGO's and Private entities including Jane Goodall institution and Tanzania track owners' association (TATOA).

6.2 Methods of Stakeholders Participation

In stakeholder involvement, simple methods such as consultations, focused group discussion and interviews were used. From one stakeholder, the team was connected to another, in a chain like or network process. Considering that this is a linear project it was important for the team to sample stakeholders to cover all the relevant categories of stakeholders relevant to Uvinza to Kigadye railway project. Consulted stakeholders include Kigoma regional secretariat, Offices and officials within the district (Uvinza District Council, Kasulu Town Council and Kasulu District Council). The initial stakeholders' consultations were done for the baseline and full ESIA in 2016, another fieldwork was conducted in 2023 according to full ESIA procedures. The fieldwork in 2023 enabled updating of information, engagement of new stakeholders and capturing the various changes across the project area since 2016. In addition, consultations were made in line with the RAP.

The aim of these consultations was to explain to them about the ESIA and Resettlement Action Plan (RAP) process, share a map of various proposed railway route alternatives, discuss various impacts associated with the project, give them an opportunity to air their views and concerns regarding the proposed project as well as determine alternatives for the project and additional potential stakeholders within their areas of jurisdiction.

A combination of mixed methods of information disclosure and consultation processes was adopted at this stage of ESIA. The method selected for consultation was designed keeping in mind the profile of the stakeholders, type of information desired and level of engagement required. In each consultation session the consultant introduced themselves, introduced the Project and the purpose of engagement with the respective stakeholder. The primary methods followed in the consultation process are:

- i. Household Questionnaire and Focus group discussion.
- ii. Village public meetings
- iii. Consultations with other stakeholders
- iv. Checklist

6.2.1 Key Informant Interviews

Key Informant Interviews (KIIs) were undertaken to gather information from those that are likely to have an influence on the project and / or that are experts in a specific topic area. These include individuals from organizations responsible for the various areas of affluence for the project, including social services, public infrastructure, biodiversity conservation, water resources and land. Respondents included key Ministry Officials, Local government Authorities including Kigoma Regional Administrative Secretary (RAS), District Commissioners (DC), District Administrative secretaries (DAS), and District Executive Directors (DEDs). Other participants included Village/Mtaa Chairperson, Village/Mtaa Executive Officer, Ward Executive Officers have been consulted purposely to provide key information (KIIs) regarding the project.

Key Informant interviews with civil and government agencies in the project area were undertaken in order to get information regarding the project, expectation and plans for the development of economic activities to be linked to the facilities. These interviews were conducted to augment and confirm data and information obtained using other tools and methodologies. The KII were conducted with TARURA, RUWASA and Army officials at Mtabila National Service Camp (JKT)



Photo 6-1: ESIA experts exchanging ideas with army officials at Mtabila National Service Camp (JKT)

6.2.2 Focus Group Discussions

A few Focus Group Discussions (FGDs) were conducted particularly for institutions with several staff members of interest to the ESIA study and the project at large. This included the district and regional secretariat with heads of departments responsible for community development, planning, land, education, cultural heritage engaged in consultations with ESIA team.



Photo 6-2: Focus Group Discussion in Buhigwe and Kasulu District Council officials

6.2.3 Village Public Consultation Meetings

The ESIA team engaged in public consultation meetings across all 25 Villages and Mitaa traversed by SGR from Uvinza to Kigadye. These consultation meetings were aimed at enabling the establishment of a communication channel between the general public and the team of consultants, the project proponents and the Government; and the concerns of the stakeholders to be known to the decision-making bodies at an early phase of project development. Specifically, the consultation and public participation aimed to:

- a) Disseminate and inform the stakeholders about the project with special reference to its key components and location.
- b) Create awareness among the public on the need for the EISA for the proposed project.
- c) Gather comments, suggestions and concerns of the interested and affected parties.
- d) Incorporate the information collected in the ESIA study



Photo 6-3: Public meetings in Nyamnyusi and Katonga villages along the project area



Photo 6-4 Public meetings in Ruhita and Kigadye villages along the project area

The village consultation meetings were organized at the ward/village level and arranged by the Village Executive Officer/Mtaa Executive Officer. Meetings involved among the participants; Village/Mtaa chairpersons, Ward Councillors, PAPs in the respective area and the general public. On average, meetings lasted for 90 minutes involving a range between 24 and 95 participants per meeting and a total of 1225 participants of which 28% were Female. The total number of participants for the public consultation meetings including the Village/Mtaa and gender disaggregation is summarized on Table 6-1.

Table 6-1: Participants of Village/Mitaa Public Consultations

District	Ward	Village/Mtaa	Date	Female	Male	Total
Uvinza	Uvinza	Ruchugi	2023-06-15	13	36	49
Uvinza	Basanza	Msebei	2023-06-15	9	27	36
Uvinza	Basanza	Basanza	2023-06-15	6	52	58
Uvinza	Rungwe Mpya	Rungwe Mpya	2023-06-16	23	72	95
Kasulu DC	Buhoro	Nyamsanze	2023-06-16	17	21	38
Kasulu DC	Rungwe Mpya	Kagaruka	2023-06-16	24	37	61
Kasulu DC	Asante Nyerere	Sogeeni Kwiliba	2023-06-16	18	24	42
Kasulu DC	Nyamnyusi	Nyamnyusi	2023-06-17	23	64	87
Kasulu DC	Nyakitonto	Katonga	2023-06-17	5	34	39
Kasulu DC	Nyakitonto	Nyakitonto	2023-06-17	12	27	39
Kasulu DC	Heru Ushingo	Heru Ushingo	2023-06-18	18	24	42
Buhigwe	Mugera	Katundu	2023-06-18	5	40	45
Kasulu DC	Buhoro	Lugoma	2023-06-18	25	63	88
Kasulu DC	Heru Ushingo	Kigadye	2023-06-18	7	17	24
Kasulu TC	Kigondo	Kidyama	2023-06-20	17	31	48
Kasulu TC	Nyumbigwa	Mwenda	2023-06-20	3	35	38
Kasulu TC	Ruhita	Ruhita	2023-06-20	4	41	45
Kasulu TC	Murufiti	Murufiti A	2023-06-20	48	43	91
Kasulu TC	Ruhita	Kanazi	2023-06-20	5	79	84
Kasulu TC	Nyansha	Nyansha	2023-06-21	22	41	63
Kasulu TC	Nyansha	Kumbanga	2023-06-21	3	33	36
Kasulu TC	Kumhama	kumhama	2023-06-21	33	44	77

6.2.4 Household Questionnaire

In each Village/Mtaa that is traversed by the railway, a sample of household identified by the RAP to be potentially affected by the project was subjected to a questionnaire to determine their demographic characteristics, economic activities, average household income and their migration patterns. The findings from these questionnaires are presented on Section 4.22 of this report.



Photo 6-5: Enumerators administering a household's questionnaire in Kigadye and Buhoro Villages Checklist

A village checklist was used to collect the general socio-economic profiles and information on availability of various social services along the proposed railway project. Information related to education and health facilities as well as village buildings, transport, police post, market place, cemetery area, water supply system and religion or cultural place were assessed through the checklist.

6.3 Identified Key Issues and Concerns

As a result of detailed assessment, public engagement and consultation, a number of issues and concerns were identified. In general, stakeholders have different opinions with regard to implementation of the proposed railway project that mainly focus on issues of compensation and environment as well as benefits of the project to the nation and local communities. Their view and concerns include the following:

6.3.1 Issues on forest resources, wildlife habitats and corridors

The proposed railway line will pass through areas endowed with significant environmental resources and rich biodiversity. Areas such as Mahale National Park, Gombe National Park, the Moyowosi-Malagarasi Ramsar Site and several forest reserves which are still intact and command important role and place in Tanzania's chain of conservation areas as vital refugia for wild animals and plants. Those varieties of plant and animal species that are sometimes endemic to certain areas are important for wider socio-economic development. The proposed railway line pass adjacent to Uvinza Forest Reserve, Mkuti Forest Reserve, Makere North Forest Reserve, Makere South Forest Reserve, and Lugufu Forest Reserve, and cuts across the Basanza Forest

and Marking Hill Forest reserve. Also, the railway passes adjacent to the Moyowosi Game Reserve.

The corridor route is characterized by open and closed miombo woodland. The open public woodlands are highly degraded mostly due to human settlement, cultivation, harvesting forest products, exploitation of construction materials and fuel wood, particularly in areas formally occupied by refugees and livestock grazing. Discussions with various stakeholders (including public officials, NGOs and research Institutions) observed that the proposed railway lines pass close to important protected areas such as Greater Mahale-Katavi Eco-system where chimpanzees and other wildlife could be criss-crossing could affect such free movement and affect conservation. Also, strategic wildlife corridors such as Ubende could be blocked altogether by the railway, leading to habitat fragmentation and resources degradation which is unacceptable

6.3.2 Loss of land in the proposed railway corridors

The proposed railway line is planned to pass through some rural and peri-urban areas. They include towns of Uvinza and Kasulu as well as semi-urbanized areas including Kanazi and Nyakitonto where the headquarters of Kasulu District Council is located. Thus, some parts of these towns and peoples' properties will be affected as within the urban areas, the railway line would require 60m wide land area. Moreover, there would be need for construction of stations and terminals all of which requiring land.

Discussion with land officers at Kigoma regional secretariat, as well as Uvinza and Kasulu District Councils revealed that within the proposed railway corridor areas there are relatively expensive structures most of which are for commercial purpose as well as social services mainly schools for which expected compensations will be significantly high. Uvinza is growing fast and the proposed railway line affects some areas with potential for enhancing development of the district. This ESIA report proposes various alternatives to consider these identified impacts.

6.3.3 Concerns about the PAPs' compensation process

One of the major concerns with regard to the project raised by most of the consulted stakeholders particularly regional and district land officers in Tanzania was on compensation related issues mainly - who will be compensated? who will pay them? and how much will they be paid? Other questions included: who will determine the rates, as well as time frame for vacating their premises to give way to project implementation? It is apparent that the low level of awareness on compensation process might be a major source of conflicts during initial stages of project implementation.

It was reported that in the past, the Metric Gauge Railway to Uvinza and Kigoma occupied a markable share of passenger and cargo towards area covered by Uvinza-Kigadye SGR railway project. The poor performance of the railway paved a way for private bus and truck owners in the transport sector. Through consultation these actors expressed their fear of business disruption from the SGR project, and commended for

consultations that will enable them to adapt new business models complementary to the SGR.

6.3.4 Benefits to the nation and local communities

The regional, district, village governments and local community were consulted and they clearly expressed their interest to take advantage of development opportunities as a result of the project development. Kigoma regional officials, the Uvinza and Kasulu district officials, as well as Kasulu Municipal council officials expressed their positive views about the project. They argued that the project will be very influential to the development of the region, the district and to the local communities because a number of people will be employed by the project especially as unskilled labour force. Such positive benefits will favour local communities who are in dire need of income for sustenance. This is in-line with the local content policy of Tanzania which emphasizes capacity building through training and on sensitization of communities to engage in the labour and construction value chains. Such initiatives shall also observe gender balancing. In addition, the project would stimulate the establishment of businesses related to project demands including provision of construction materials, agriculture, and livestock and fisheries products. Furthermore, discussions with Uvinza District officials revealed that Kasulu town is growing fast and that the proposed railway line will enhance the development of the district therefore the community would significantly benefit from the railway line. They further pointed out that Burundi is the main market of maize produced in both Uvinza and Kasulu district; the presence of the proposed railway line would ease transportation and therefore enhance business.

Similarly, the Kigoma Regional officials said that the proposed project is expected to benefit the nation and local communities in terms of improvement of transport mainly in areas that are currently not accessible as well as reduce transport cost considering that railway is one of the cheapest means of transport. Also, the routes transverse through the Uvinza Salt Mining area, where salt mining remains an important historical and economic activity that has been in operation since before independence, thus the proposed railway line would attract large human population and make Uvinza an important mining centre.

CHAPTER SEVEN

7 IMPACT IDENTIFICATION, ASSESSMENT AND EVALUATION

7.1 Impacts Identification

Impact identification in this ESIA sought to ensure that all potential impacts are teased out. The simplest impact identification tool, i.e., the checklist of impacts was used as presented in Table 7-1. These checklists are based on the scoping and updated ESIA study.

Table 7-1: Checklist of impacts

Phases	Positive impacts	Negative impacts
Impacts related to social and economic environment		
Mobilization	<i>Employment opportunities</i>	Disruption of road and public utilities/infrastructures
	Increased Government revenues generation	Displacement of people and loss of land and other properties
	Increased local economy	Increased risks of HIV/AIDS and STDS
	Increased crop and livestock production	Increased land use conflicts
		Demographic changes
		Increased pressure on natural resources
		Increased pressure on social services
		Displacement of people and loss of land and other properties
		Impacts on occupational health and safety
		Impacts on community health and security
		Impact on Gender Based Violence and Harassment (GBVH)
		Increasing pressure and

Phases	Positive impacts	Negative impacts
		encroachment of grazing and pasture land
Construction phase	Employment opportunities	Increased risks of HIV/AIDS and STDS
	Increased employment opportunities	Increased land use conflicts
	Increased Government revenues generation	Demographic changes
	Increased local economy	Increased pressure on natural resources
	Increased crop and livestock production	
		Impacts on occupational health and safety
		Impacts on community health and security
		Impact on Gender Based Violence and Harassment (GBVH)
		Grazing land fragmentation and disturbance
		Destruction and contamination of livestock water points
		Restricting access to stock routes and resources
Operation phase	Improved transportation of goods and people	Impact on Noise and vibration
	Increased crop and livestock production	Impact on community Health and Safety
	Enhancement of trade within East African Countries	Impact on Occupational Health and Safety
		Increased level of waste generation
		increase pressure of natural resources
Decommissioning	Employment opportunity	Impact on Occupational Health and

Phases	Positive impacts	Negative impacts
		Safety
		Impacts on community health and safety
		Increased maintenance cost for trunk roads
		Deterioration of trade within East African Countries
		Loss of employment
Impacts related to physical and biological environment		
Mobilization		Impact on Air quality
		Noise and vibration pollution
		Habitat alteration and fragmentation
		Biodiversity loss
Construction phase		Vibration
		Change in surface run-off
		Soil erosion and siltation
		Change in landscape and scenic quality
		Spread of exotics/invasive species
		Change in liquid waste management
		Generation of overburden soil material
		Change in solid waste management
		Surface water pollution
		Ground water pollution
		Damming/flooding
		Disruption of wildlife movement and migration
		Loss of vegetation
		Change in biodiversity

Phases	Positive impacts	Negative impacts
		Increased loss of wildlife
		Change in noise levels
		Impaired local air quality
Operation phase		Impact on Noise and vibration
		Increased level of waste generation
		Disruption of wildlife movement and migration
		Change in biodiversity.
		Increased loss of wildlife Spread of exotics/invasive species
Decommissioning		Impacts on air quality
		Impacts on noise and vibration
Impacts on Cultural Heritage		
Mobilization phase		Grave and grave yard removal
		Destruction of ritual sites
		Destruction/loss of artifacts and archaeological features
		Displacement of artifacts from their primary contexts
		Disruption of hominids fossil remains
Construction phase		Destruction/loss of artifacts and archaeological features
		Displacement of artifacts from their primary contexts
		Disruption of hominids fossil remains

7.2 Impact Prediction

Impact prediction or estimation of the magnitude, extent or duration of the impacts was done by comparison with the situation without the project. The initial baseline condition prior to project implementation provided the basis for forecasting the future scenario with or without the project and compares the changes with existing established standards, relevant national and sectoral laws and regulations while taking cognizance of stakeholder views and concerns. The approach to impact prediction was to give ratings for each identified potential impact and producing a correlation matrix (Table 19). In the matrix ratings ranged from 0 to +3 for positive impacts and from 0 to –3 for negative ones, where:

+3 - Very High Positive Impact

+2 - High positive Impact

+1 - Minor Positive Impact

0 - No Impact

-1 - Minor Negative Impact

-2 - High Negative Impact

-3 - Very High Negative Impact

Based on the above-mentioned criteria and the score on the rating scale, impacts identified were grouped in phases i.e., impact related to construction, operation and decommissioning of the project.

Table 7-2: Correlation Matrix for the Uvinza - Kigadye Railway Project

		Mobilisation phase					Construction phase								Operation phase				Decommission phase			
		Mobilisation of equipment and material	Labour recruitment	Construction and management of workers	Land acquisition	Corridor/Site clearance	Recruitment of labours force	Construction of access roads	Construction of railway embankment	Laying of rail and related	Construction of station and related infrastructures	Construction of bridges and culvert*	Transportation of construction materials	Construction of viaducts	Recruitment of workers	Transportation of goods and passengers	Railway line and train maintenance	Use and maintenance of stations	Laying off labours	Demolition of infrastructure	Site rehabilitation	Spoil management
1	Vibration	-2	0	-1	0	-1	0	-2	-1	-1	-1	-1	-2	-1	0	-2	0	-1	0	-1	-1	-1
2	Change in surface run off	0	0	-1	0	-2	0	-2	-3	0	-1	-1	-1	-1	0	0	0	0	0	-1	+1	-1
3	surface pollution water and siltation	-1	0	-2	0	-2	0	-2	-2	-1	-1	-2	-1	-2	0	-2	-2	-2	0	-2	+1	-2
4	Ground pollution water	-1	0	-2	0	-1	0	-1	-2	-1	-1	-2	-1	-2	0	-1	-1	-2	0	-1	+1	-2
5	Soil pollution	-1	0	-2	0	-1	0	-1	-2	-1	-1	-1	-1	-1	0	-1	-1	-1	0	-1	+1	-2
6	Air pollution	-2	0	-1	0	-2	0	-2	-2	-1	-1	-1	-2	-1	0	-2	-1	-1	0	-2	+1	-1
7	Soil erosion	-2	0	-1	0	-2	0	-2	-2	0	-1	-1	-2	-1	0	0	-1	0	0	-1	+2	-1

		Mobilisation phase					Construction phase								Operation phase				Decommission phase			
		Mobilisation of equipment and material	Labour recruitment	Construction and management of workers	Land acquisition	Corridor/Site clearance	Recruitment of labours force	Construction of access roads	Construction of railway embankment	Laying of rail and related	Construction of station and related infrastructures	Construction of bridges and culvert*	Transportation of construction materials	Construction of viaducts	Recruitment of workers	Transportation of goods and passengers	Railway line and train maintenance	Use and maintenance of stations	Laying off labours	Demolition of infrastructure	Site rehabilitation	Spoil management
8	Solid waste generation	-1	0	-2	0	-2	0	-1	-2	-2	-2	-2	-1	-2	0	-2	-2	-2	0	-3	+1	-2
9	Liquid waste generation	-1	0	-2	0	-1	0	-1	-2	-2	-2	-2	-1	-2	0	-2	-2	-2	0	-1	-1	-2
10	Management of overburden	0	0	-1	0	-2	0	-1	-3	0	-1	-1	0	-1	0	0	-1	0	0	0	0	0
11	Disruption of road and public utilities	-2	0	-1	0	-2	0	-1	-2	0	-1	-1	-2	-1	0	0	-1	0	0	-2	-1	0
12	Change in Rivers and streams morphology	0	0	0	0	-2	0	-2	-2	0	-1	-2	0	-1	0	0	-1	0	0	-1	-1	-1
13	Damming/ponding effect	0	0	0	0	0	0	-2	-2	0	0	-2	0	0	0	0	0	0	0	+1	+1	-1
17	Deforestation habitat fragmenetation	-1	0	-1	0	-2	0	-1	-1	0	-1	0	0	0	0	-2	-1	0	0	0	+1	-1
18	Loss of biodiversity	-1	0	-2	0	-2	0	-2	-1	0	-1	-1	0	-1	0	-1	-1	-1	0	-1	+1	-2

		Mobilisation phase					Construction phase								Operation phase				Decommission phase			
		Mobilisation of equipment and material	Labour recruitment	Construction and management of workers	Land acquisition	Corridor/Site clearance	Recruitment of labours force	Construction of access roads	Construction of railway embankment	Laying of rail and related	Construction of station and related infrastructures	Construction of bridges and culvert*	Transportation of construction materials	Construction of viaducts	Recruitment of workers	Transportation of goods and passengers	Railway line and train maintenance	Use and maintenance of stations	Laying off labours	Demolition of infrastructure	Site rehabilitation	Spoil management
19	Habitat loss and/ alteration	-1	0	-2	0	-2	0	-2	-1	0	-1	-1	0	-1	0	-1	-1	-1	0	-1	+1	-2
20	Damage to or alteration of wetland areas	-1	0	-2	0	-2	0	-2	-1	0	-1	-1	0	-1	0	-1	-1	-1	0	-1	+1	-2
21	Risk of increased spread of invasive species	-1	0	-2	0	-2	0	-2	-1	0	-1	-1	0	-1	0	-1	-1	-1	0	-1	+1	-2
22	Interference of wildlife movement corridor	-1	0	-2	0	-2	0	-2	-1	0	-1	-1	0	-1	0	-1	-1	-1	0	-1	+1	-2
23	Loss/reduction of ecosystem services	-1	0	-2	0	-2	0	-2	-1	0	-1	-1	0	-1	0	-1	-1	-1	0	-1	+1	-2
24	Change in landscape and aesthetics	-1	0	-1	0	-2	0	-1	-2	-1	-1	-2	-1	-2	0	-1	-1	-1	0	-1	+1	-2
25	Increased employment opportunities	+1	+2	+2	0	+1	+3	+1	+2	+2	+2	+2	+1	+2	+2	+3	+1	+2	-3	+1	+1	+1

		Mobilisation phase					Construction phase								Operation phase				Decommission phase			
		Mobilisation of equipment and material	Labour recruitment	Construction and management of workers	Land acquisition	Corridor/Site clearance	Recruitment of labours force	Construction of access roads	Construction of railway embankment	Laying of rail and related	Construction of station and related infrastructures	Construction of bridges and culvert*	Transportation of construction materials	Construction of viaducts	Recruitment of workers	Transportation of goods and passengers	Railway line and train maintenance	Use and maintenance of stations	Laying off labours	Demolition of infrastructure	Site rehabilitation	Spoil management
26	Increased government revenue generation	+1	+1	+1	0	+1	+1	+1	+1	+1	+1	+1	+1	+1	0	+3	+1	+3	-3	-2	0	+1
27	Improved local economy	+1	+1	+2	-2	+1	+2	+1	+2	+2	+2	+2	+1	+2	+2	+2	+1	+2	-3	+1	+1	+1
28	Improved transportation system	0	0	0	0	0	0	+1	+1	+1	+1	+1	+1	+1	0	+3	+2	+2	0	-2	0	0
29	Change in land values	+1	0	+1	+2	0	+1	+1	+2	+2	+2	+1	+1	+1	+1	+2	+1	+2	0	0	+1	-2
30	Enhanced regional trade	0	0	0	0	0	0	+1	+1	+2	+1	+2	+2	+2	0	+3	+1	+2	0	-2	0	0
31	Increased risk of HIV and STDs	-2	-1	-2	0	-2	-2	-2	-2	-2	-2	-2	-2	-2	-2	-1	-1	-2	-1	-1	-1	-1
32	Noise pollution	-1	0	-1	0	-2	0	-2	-2	-2	-2	-1	-2	-1	0	-2	-1	-1	0	-2	-1	0
33	Increase in crime and insecurity	-2	0	-2	-2	-2	0	-1	-2	-2	-2	-2	-2	-2	-2	-2	-1	-2	-2	-1	-1	0

		Mobilisation phase					Construction phase								Operation phase				Decommission phase			
		Mobilisation of equipment and material	Labour recruitment	Construction and management of works	Land acquisition	Corridor/Site clearance	Recruitment of labours force	Construction of access roads	Construction of railway embankment	Laying of rail and related	Construction of station and related infrastructures	Construction of bridges and culvert*	Transportation of construction materials	Construction of viaducts	Recruitment of workers	Transportation of goods and passengers	Railway line and train maintenance	Use and maintenance of stations	Laying off labours	Demolition of infrastructure	Site rehabilitation	Spoil management
34	Hazards, Risks and accident	-2	0	-2	0	-2	0	-2	-2	-3	-2	-2	-2	-2	0	-2	-2	-2	0	-2	-1	-2
35	Loss of land and properties	0	0	0	-3	-1	0	-2	0	0	0	0	0	0	0	0	0	0	0	0	0	-2
36	Land use conflicts	-1	0	-1	-2	0	0	-2	0	0	-2	0	0	0	0	0	-1	0	0	0	0	-2
37	Pressure on local social services	-1	-1	-2	0	-2	0	-2	-2	-2	-2	-2	-1	-1	-2	-2	-2	-2	-1	-1	0	-1
38	Pressure on water resources	0	0	-2	0	-1	0	-1	-3	-1	-2	-2	0	-2	0	-2	-1	-2	0	0	-1	0
39	Change in demographic characteristics	-1	0	-2	0	-2	0	-1	-2	-2	-2	-1	-1	-1	0	-2	-1	-2	-1	0	-1	0
40	Loss of Iron Age potsherds and Later Stone Age artifacts from archaeological sites	0	0	-2	0	-2	0	-2	-2	0	-2	-2	0	-2	0	0	0	0	0	0	0	0
41	Destruction of Iron Age pottery sites	0	0	-2	0	-2	0	-2	-2	0	-2	-2	0	-2	0	0	0	0	0	0	0	0

		Mobilisation phase					Construction phase								Operation phase				Decommission phase			
		Mobilisation of equipment and material	Labour recruitment	Construction and management of workers	Land acquisition	Corridor/Site clearance	Recruitment of labours force	Construction of access roads	Construction of railway embankment	Laying of rail and related	Construction of station and related infrastructures	Construction of bridges and culvert*	Transportation of construction materials	Construction of viaducts	Recruitment of workers	Transportation of goods and passengers	Railway line and train maintenance	Use and maintenance of stations	Laying off labours	Demolition of infrastructure	Site rehabilitation	Spoil management
	and LSA tool sites																					
42	Destruction of potential CSITR heritage	0	0	-2	0	-2	0	-2	-2	0	-2	-2	0	-2	0	0	0	0	0	0	0	0
43	Destruction of potential Salt Caravan Route heritage	0	0	-2	0	-2	0	-2	-2	0	-2	-2	0	-2	0	0	0	0	0	0	0	0
44	Degradation of potential archaeological and cultural heritage sites	0	0	-2	0	-2	0	-2	-2	0	-2	-2	0	-2	0	0	0	0	0	0	0	0
45	Change of intangible heritage	0	0	-1	0	-1	0	-1	-2	-2	-1	-1	-1	-1	0	-2	-1	-2	0	0	0	0

7.3 Evaluation of Significant Impacts and Mitigation/Enhancement Measures

Evaluation of impacts significance is a critical component of impact assessment. The interpretation of impact significance bears directly on project costs and condition setting. Similarly, impact significance provides the key to selecting project alternatives. Determination of significance also contributes to internalization of impact costs in the overall project costs. Thus, mitigation measures are developed for impacts that are considered to be significantly negative, while enhancement measures are developed for impacts that are considered significantly positive.

Thus, significantly negative impacts are all that scored -2 and -3, whereas significantly positive ones were those that scored +2 and +3. Those with a score +/-1 were considered as insignificant, but were further considered under cumulative and incremental impacts where relevant. Sub-sections 6.3.1 to 6.3.4 provide evaluation of impacts under different categories.

7.3.1 Impacts related to social and economic environment

The proposed railway alignment mainly traverses agricultural and grazing land, with minimal impact on residential and commercial properties. This section briefly addresses the potential impacts that the Project will have on those whose physical and economic assets will be affected. This will help in planning to resettle/compensate those to be affected adequately and restore their livelihood to a minimum of the pre-project status as required by the governments of Tanzania, as well as the prospective funders of the project.

7.3.1.1 Positive Impacts

✓ Increased employment opportunities

Youth employment situation remains one of the key challenges in Tanzania. The Integrated Labour Force Survey 2014 shows that unemployment rates are highest for persons below 35 years of age in all areas. The total number of employed youths (aged 15-34) according to the National Definition is 11,007,809 while the unemployed youths are 1,463,182 about 10.0% of the total youth workforce (ILFS, 2014.). Various range of interventions involving not just government agencies, but other stakeholders including civil society organizations, international donors and, to a lesser extent, the private sector are being undertaken to increase employment opportunities in the country.

Based on the above standpoint, the proposed development will create some employment opportunities for casual workers. Establishment of construction camps during mobilization phase will create direct and indirect employment to the locals as well as people from other places. Direct employment will be in the form of both unskilled and skilled laborers. More opportunity for employment is expected during construction phase when much more labour will be required in the construction of access roads, earth works, rail embankments, laying of rails, construction of terminal, stations, bridges,

culverts and other related infrastructures. The construction phase will also create indirect employment to different people including food vendors (especially women) and other small businesses like sale of soft drinks. For decommissioning to take place properly and in good time, several people will be involved as skilled or unskilled workers to carry out the demolition works. As a result, a smaller number of employment opportunities will be created during this phase of the proposed project. The decommissioning phase will also require workers for demolition of infrastructure and site rehabilitation. The estimated labour force in all phases of the project is shown in section 2.4 on Table 4 and Table 5.

Enhancement measures:

- Give employment priority to the local communities with relevant skills based on gender
- Provide on job training to workers
- Support local technical training institutions to build capacity (skills relevant to the project) to the communities

✓ ***Increased government revenue generation***

Transportation of goods is the main objective for the projects and therefore will have a significant impact to the government revenue through taxes due to transportation of goods and containers at Dar es Salaam to Gitega through Uvinza railway station. The significant increase in Government revenue will start to be realized during operation phase due to transportation of different goods such as mineral like nickel from Msongati and other services. The railway line will also stimulate agriculture, mining and industrial development. However, economic benefits due to the Uvinza Railway station are unclear because it is not one of the stations to be further developed as part of the Uvinza to Kigadye Railway project.

Similarly, revenue will come from taxes that will be collected as revenues from transportation of different goods because the proposed railway line is expected to operate in three major traffic groups namely,

International transit movements of freight to and from Burundi

International imports and exports to and from Dar es Salaam harbour and

Local domestic movements of freight and passengers along Uvinza, Kasulu to Kigadye

Another source of government revenue during operation phase will come from a large number of employees who will be paying their taxes to the government as “Pay-as-You Earn (PAYE). However, it should be noted that, the benefit to the government would decline during the decommissioning phase of the project when workers will be laid off and infrastructure will be demolished implying the end/decline of government revenue from the project.

Enhancement measures:

- Ensure allocation of sufficient financial resources for implementation of the project (e.g. through PPP, Bank loans, own funds)
- Ensure timely implementation of the project
- Improve security of the railway facilities to attract more customers
- Improve *tax collection mechanisms within the railway catchment*

✓ *Improvement of local economy*

It is without doubt that, the transport sector plays a pivotal role in the transportation of goods from one destination to another and hence boosting the agricultural, industrial and other sectors of the economy. The railway project will stimulate local economy and improve the quality of life of people living along the proposed railway line in the two countries. This is because the railway traverse areas with potential for agriculture and mining development.

Agriculture is the leading sector in the Tanzanian economy and it is going to continue to be so for several decades to come. The sector contributes approximately 50% to the country's GDP: food crops contributing about 35% of the agricultural GDP followed by livestock production, which accounts for 30% of the agricultural GDP. In fact, agriculture contributes over 60% of export earnings. It is estimated that about 95 to 97% of the food consumed in the country is produced locally with imports consisting mainly of food items that are not produced in adequate quantities in the country e.g. wheat and sugar.

During construction and operation phase, the local people both unskilled and skilled will be employed in different activities. This will generate income to the people who will be capable of buying and paying for their different needs. The railway line also traverses remote areas without any means of transport. During the operation phase, the railway line will open up these areas and reduce the transport costs as well as increase its reliability and facilitate movement of agricultural products in villages such as Rungwe Mpya, Katundu, Buhoro and Basanza which are potential for production of rice, maize, bananas, cassava and sugarcane.

It is therefore anticipated that the construction of the railway line will stimulate agricultural development because of reliable transport which will increase farmer's accessibility to markets. The impact of this railway investment will thus be long-term and highly significant during the operation phase of the project.

The railway will also facilitate movement of farm implements, promote petty business along the project area; increase income to local communities; facilitate transportation of construction materials; and reduce the price of construction materials and enable people to build modern houses and hence improve the quality of their lives. On the other hand, the project will have negative impacts during the decommissioning phase because laborers will be retrenched and hence the loss of their major means of income.

Enhancement measures:

- Promote economic linkages with railway line
- Provide incentives to various productive sectors and entrepreneurs such as loans for investments
- Set affordable railway transportation costs
- Promote availability of markets for goods
- Promote small scale food processing industries for value addition

✓ Enhanced Regional Trade

The proposed Uvinza - Kigadye railway line would be connected to Dar es Salaam - Kigoma railway line at Uvinza through another initiative, which is upgrading the existing Dar es Salaam – Kigoma railway line to Standard gauge. The Uvinza - Kigadye railway line will transverse in Uvinza and Kasulu district where crops such as maize, paddy and cassava are produced and in high demand in Burundi. In addition, the railway line could enhance trade of salt produced at Uvinza. Unfortunately, this project does not seem to include improvement of Uvinza railway infrastructure that links to the nearby salt industry in terms of transportation. If this is the case, it must be very unfortunate as the Uvinza - Kigadye railway will significantly negate the economic potential of Uvinza District and Kigoma region.

The infrastructure will therefore be expected to reduce the cost of doing business in the region hence attract several investments needed to stimulate the necessary economic growth. Enhance regional trade will create economic growth and jobs and generate wealth and personal incomes with the country and East Africa in general significantly.

Enhancement measures

- Ensure timely implementation of the project to high standards
- Ensure allocation of sufficient financial resources for implementation of the project.
- Effective implementation of the trade protocols
- Re-consider development of the Uvinza railway station in relation to the local (district and regional) industrial trade including the salt industry at Uvinza

✓ Improved transportation system

During the operation phase, cargo and passengers' transportation would be the most fundamental activity. The Uvinza – Kigadye railway line will provide a huge transportation in the existing central line as it will connect to the Central Line via Kaliua. Also, it will facilitate regional trade by linking the Democratic Republic of Congo through Rwanda and Burundi. This railway line goes through salt mining areas in Uvinza, hence the salt products from Uvinza would be transported to Burundi markets and Tanzania markets in Dar es Salaam, Shinyanga, Mwanza, Musoma etc. food and cash crops including livestock would be transported to and from various markets as well as raw materials to the related industries.

Enhancement measures

- Improve security at the Dar es Salaam port and on-transit
- Promote industrial development in the railway catchment area
- Ensure allocation of sufficient financial resources for implementation of the project (e.g., through PPP, Bank Loans, own funds)
- Ensure regular maintenance of the railway line
- Promote economic linkage with railway line
- Establish effective institution arrangement to manage the railway

7.3.1.2 *Negative Impacts*

✓ Loss of land, assets and other properties

Loss of land

Loss of people's land and other properties is one of the significant impacts in this project. The mobilization phase of the proposed railway project will involve acquisition of land for railway line, camps and stations. The preliminary design shows that the proposed railway line will cover 156km between Uvinza (Tanzania) to Kigadye. Since most of line traverse rural areas a 60m right of way will be required or a total of approximately acres will be acquired. Additional land take will be required for railway stations and e.g at Kasulu. The total affected land required for railway corridor from Uvinza – Kigadye is about **12,975,120m²** equivalents to 3,206 acres and the total size of land required for stations is about **1,168,000 m²** equivalents to 289 acres of land.

In addition, the field assessment noted that about 160 plots of agricultural land which is used for permanent and seasonal crop cultivation will be affected. As such, agricultural activities as means of their livelihoods in terms of food and source of income will be affected by the Uvinza –Kigadye SGR Project. Table 7-3 provides number of the lost plots used for agricultural activities. Approximately 1,509.48 acres will be affected for the agricultural land. Table 7-4 shows the estimated number of potential agricultural land to be affected by the SGR project.

Table 7-3: Potential affected agricultural land along the project

District	Ward/Village	Plots for Agriculture activities
Uvinza	Ruchugi	5
	Msebehi	17
Kasulu Town	Ruhita	30
	Mwenda	14
	Nyansha	28
Kasulu District	Rungwe Mpya	4
	Kaguruka	9
	Nyamnyusi	3
	Muksha	15
	Nyamsanze	18
	Herushingo	2
	Sogeeni kwiriba	3
Buhingwe	Kajana	2
	Katundu	10
Total		160

Source: TRC, Field survey (2023)

Loss of crops and trees

Moreover, the construction activities will result in the clearing of crops and trees cultivated/planted along the project area. These include perennial crops which take more than a year to reach full maturity and can be harvested over a long period such as fruit trees (orange, lemon, guava, mangoes, baobab etc. Also, annual or seasonal crops taking less than six months to reach maturity for harvesting such as Maize, Beans, Cassava, Groundnuts, Rice, Sunflowers, Cottons, Millet, and Potatoes will be affected and usually valued in terms of acreage. Total of 2,939 trees will be affected

Table 7-4: Number of projects affected properties

Regions	District/Municipal/Town Council	Village/Mtaa	PAPs Losing Crops and trees
Kigoma	Uvinza District Council	Ruchugi	13
		Basanza	17
		Sogeeni-Kwiriba	28
		Msebehi	8
	Kasulu Town Council	Nyansha	59
		Buhoro	43
		Ruhita	110
	Kasulu District Council	Heru Shingo	15
		Mwenda	36
		Nyakitonto	38
		Kaguruka	34
		Kigondo	2
		Korongo	21
		Rungwe Mpya	21
	Buhigwe District Council	Katundu	32
		Kajana	2
Nyamnyisi		3	
TOTAL		482	

Source: TRC, Field survey (2023)

✓ **Loss of structures and properties**

There are several residential structures along the proposed railway line that will be affected by the project. Following the results of the field survey performed and the subsidiary counting of houses along the proposed line it is estimated that about 506 houses will be affected in the right of way and have to be removed. There are graves which will be affected by the project because they are located within the wayleave of the railway line. The acquisition process will be undertaken during project mobilization. This that the affected people will be required to demolish and vacate their house before the commencement of construction. The number of houses to affected are shown in Table 7-5 and Photo 7-1.

Table 7-5: Potential number of affected structures and properties

Villages/Steet	Complete residential structures	Incomplete/under-construction structures	Outside Toilets	Outside Kitchen	Farm/ animal shades	Total structures
Uvinza	16	7	2	1	0	26
Kasulu Town	29	6	4	11	1	51
Kasulu District	95	23	21	18	0	157
Buhingwe	24	0	1	6	0	31
Total	164	36	28	36	1	265

Source: TRC, valuation report (2023)



Photo 7-1: Potential affected houses in Kasulu Uvinza and Kasulu districts – Tanzania

Source: Field survey, 2022

Mitigation measures

- Provide detailed information to affected persons about their rights/ options pertaining to land acquisition
- Provide fair prompt and effective compensation at full replacement cost
- Acquire only land necessary for the proposed project (including access roads)
- Confine construction and operation activities within designated wayleave
- ✓ **Impact on Public infrastructures and services**

Field observation noted that there will be public infrastructure that will be affected by the proposed project development. The impact will be critical during mobilization and construction. There will be underground water pipes and sewage system infrastructure in Kasulu town and Kasulu district, particularly at Mtabila National Service camp, Mgogo primary school in Katundu village in Buhigwe district that will be affected by the proposed SGR line from Uvinza to Kigadye. Village. Table 7-6 and Photo 7-2 show the potential infrastructure and properties to be affected by the proposed SGR project.

Table 7-6: Potential infrastructure and properties to be affected by the proposed SGR project

District	Village	Institution Name	Type of Institution	Affected Properties
Uvinza	Migongwe	Tuungane Group	CBO	Land
		Mtaa Migongwe-Ruhita	Village government	Land & Crops
	Nyansha	Free Pentecostal Church Of Tanzania-Nyansha	Religious	Land & Crops
Kasulu District	Rungwe Mpya	Taasisi ya Matumizi Bora ya Ardhi	Agricultural production	Land & Crops
	Kaguruka	Kaguruka	Village government	Land
	Mkesha	Chama cha Msingi Matabaro AMCOS	SACOSS	Structure & Land
		Baptist Church Tanzania-Nyakitonto	Religious	Land & Crops
		Mukesha	Village government	Land
	Nyamsanze	Eneo la Kanisa	Religious	Land
		Fidesu (Fighters Development Sustainability)	NGO	Land & Crops

District	Village	Institution Name	Type of Institution	Affected Properties
		Nyamsanze	Nyamsanze village government	Land
	Katonga	Mtabila National Service Camp	Tanzania People's Defence Force (TPDF)	Land
	Katonga	Mtabila National Service Camp	Underground water pipe infrastructure	Underground water pipes and water sources
	Lugoma	Village government	Lugoma	Land – Football ground
Buhingwe	Kajana	Grazing land	Local government office	Land
	Katundu	Mgogo primary school	Buhigwe District Council	Structure Land & Crops



Photo 7-2: Potential affected Mgogo primary school in Katundu village in Buhigwe district

Source: ESIA Field survey, 2023



Photo 7-3: Potential affected football ground with grass fence in Lugoma village in Buhigwe district

Source: ESIA Field survey, 2023

Mitigation measures

- Provide fair prompt and effective compensation at full replacement cost
- Replace affected social services/structures prior to demolition
- Acquire only land necessary for the proposed project
- If possible, route realignment should be considered
- Relocate the graves in accordance with national laws

✓ Increased level of crime and insecurity

Crimes and insecurity at construction sites is a common problem. However, during mobilization phase of the project may have a minor negative, short-term effect on the levels of crime and insecurity in the area. The major long -term negative impact of the proposed development could be related to the influx of people during construction and operation phases. During construction phase, more people from different parts of the two countries will be recruited by the project to work at different stage of railway construction. As more people migrate into the area social vices such as crime, theft of construction materials and other properties, alcoholism and sexual laxity/ prostitution are likely to occur, as they are associated with migrant workers living alone, away from

their families. These people will become idle and are likely to be forced to steal some of the demolished infrastructure for earning their living.

Mitigation measures

- Sensitize workers and surrounding communities to implement measures to protect railway.
- Provide a reliable escort and security for the project goods and facilities.
- Involve the local community in the maintenance and management of new infrastructures to ensure their sustainability.

✓ Change in Demographic characteristics

The settlements in the most parts of the project area in Tanzanian side are predominantly rural and therefore their population sizes are generally small with scattered settlements. Given the very small size of most of the communities and concentration of people in Burundi, the influx of workers from other parts of the country during the construction phase will significantly affect the demography of the communities, not just in terms of population numbers but also in terms of population structure. The latter will be a function of the selective nature of migration which is often dominated by adult male population. Construction activity will no doubt affect the sex ratio of communities for the period the activity is taking place in particular communities. Sex ratio imbalances might be associated with issues like violence against women and sharing of partners which may accelerate the spread of infectious diseases such as HIV/AIDS.

Mitigation measures

- Use local labour taking into account relevant skills and gender
- Provide reproductive health education

✓ Increased accidents, risks and hazards

Construction of the proposed railway line will include undertaking a number of activities involving mechanical operations of heavy machines and equipment which are susceptible to accidents, risks and hazards. The risks and hazards will also take place during the mobilization phase especially in relation to long hauling distances of construction materials from distant borrow/quarry sites. (The impact is expected to be significant but short-term.

The high potential areas for accidents, risks and hazards include Rungwe Mpya around the flood plain, Malagasi River crossing where construction of railway line would involve use of a number of viaducts and extensive bridges. During project operation the risk and hazards will also be associated with oil spills at stations, workshops and bridges which may result in pollution of water and soil.

Mitigation measures:

- Provide training on relevant safety measures, first aid procedures and emergency response to workers.
- Provide full package of first aid kit at work places and workers' camps
- Provide and enforce use of PPEs
- Put warning signs in dangerous corners, animal crossings and other risk areas
- Use approved and environmentally acceptable chemical substances for cleaning trains
- Regular maintenance of train engines to minimize oil leakage
- Provide oil skimmers at all designated maintenance bays and dispose through registered oil collectors
- Discharged waste water to meet Tanzania and Burundi water quality standards

✓ Increased land use conflicts

The proposed railway line project would acquire substantial amount of land, whereby if not properly done, the land acquisition process could lead to serious land use conflicts. The main sources of conflicts could result from unfair compensation and delayed payments. This impact would be highly significant both in terms of magnitude and duration, and would be irreversible because as long as the land is acquired by the project it will cease to be accessed by the communities. Land use conflicts are also likely to occur due to high demand for land by people who would want to settle along the railway line for agriculture and commercial purposes including seeking for employment. Furthermore, land use conflicts would also be experienced during the decommissioning of the railway project when many workers will be laid-off and the latter start seeking for alternative land and livelihoods. It is also notable that location of construction material sources close to farm land and human settlement would in one way or the other lead to land use conflicts due to noise and dust generation as well as land take.

Another set of land use conflict are likely to result from developments in Uvinza. Although in this project there is no planned development at the current Uvinza station. In this project it is assumed that such developments might be undertaken as part of the ongoing Standard Gauge development of the Dar es Salaam/Kigoma railway. Such developments could include more land take for construction of more railway station infrastructure as well as other public and private infrastructures. As a result, the station is likely to grow rapidly and land could be on high demand, leading to cumulative land use impacts. Should the Uvinza station be further expanded, it is likely to be associated with cumulative physical blockade of wildlife corridors, agriculture and settlement encroachment into wildlife protected areas, habitat alteration including fragmentation, and direct barrier effects as they cross the Uvinza Forest Reserve due to railway construction (and associated high human presence and noise) with varying effects on different animal species. Some

species would avoid the railway altogether at much greater distances than others, requiring different conditions for crossing (e.g., chimpanzees). This could lead to fragmentation of wildlife populations and the consequent collapse of the GGE functionality and species extinction. Specifically, cumulative impacts would be due to blockade of any wildlife movement among Lugufu, Uvinza and Ilunde Forest Reserves.

Mitigation measures:

- Effect prompt and fair compensation for the lost land at full replacement cost
- Raise awareness to the local communities on land ownership and compensation issues
- Establish proper grievance redress mechanisms
- Prepare and enforce land use plans
- Avoid location of construction materials too close to human settlements and agricultural lands.
- Maintain the wildlife corridors and dispersal areas within the Greater Gombe Ecosystem (GGE)

✓ **Change in land values**

The mobilization phase would entail land acquisition. This land is currently used variously by the communities and institutions such as farming, residence as well as social services such as schools and health services. Being a 60 meters wide linear project and covering approximately 230 km long, the impacts would be felt differently along the route. The change in the value of land would be very significant and long term in urban areas than in rural areas.

The project is likely to attract more people along the new railway corridor and thus push demand for land and other resources to higher levels that may not be affordable to many of the local people. Accordingly, the cost of land and essential resources (basic needs) and environmental degradation may be overwhelming and constitute a significant cost element to local communities. Change in land value is also expected due to demand for land near the railway line as several people including railway workers would start grabbing land for investment near the railway line as well as for settlement. This problem is likely to be relatively significant and long term.

Mitigation measures

- Acquire only land that is needed for the project development.
- Raise awareness to local people about not selling land haphazardly
- Develop and enforce policies that will discourage land speculating
- Put measures to control land prices

✓ **Increased risk of HIV/ STDs**

Tanzania has declared HIV/AIDS as a national disaster. The pandemic has affected all sectors of the economy and the war seems to be still very far from ending. During stakeholder's consultations, high proportion of the Uvinza and Kasulu district councils acknowledged the existence of HIV/AIDS.

Construction of railway and its services will increase mobility, migration and interaction of people, communities and nations at large. This is likely to increase transmission of communicable diseases such as HIV/AIDS and other STDs. Given the danger of the diseases it is predicted that the risk is equally high throughout the four phases and for almost all the activities that will be undertaken therefore its one big potential challenge that has to be taken into consideration during development of the Uvinza – Kigadye railway line. However, it should be noted that this project is not going to bring HIV/AIDS in the districts but that the risk of spreading the disease is quite high as even if one person will be infected that should be a matter of concern.

Mitigation measures

- Provide awareness on HIV/AIDS and other communicable diseases.
- Provide Voluntary Counselling and Testing
- VCT centres for HIV/AIDs at work place,
- Enforce HIV/AIDS law and regulations that prohibit stigma, discrimination and responsibility of taking care of the affected communities

✓ **Pressure on local social services**

Most of the villages visited and located adjacent the railway line did not have adequate services and the situation was generally bad in terms of health services and water services to meet the demand of the existing and the anticipated growing population. Increase in the size of population will put more pressure on existing services to meet demands. Pressure on social services will occur in all phases of the project but will be more significant during the construction phase of the project. Construction and operation of the railway is associated with accidents, risk and hazards, as a result, social services such as hospitals and water infrastructure need to be adequately available.

Mitigation measures

- Support the cost of local social services where necessary
- Support development of new social services where necessary

✓ **Pressure on water resources**

Pressure on water resources will arise as a result of increased demand on such a resource from the various people that will be involved in construction works and those that will come to provide services to the workers as well as for railway construction works. However, on the Tanzania side most of the project areas may have abundant water during the rains and not during the dry season due to seasonality of most rivers. .

Therefore, during the **construction phases**, water abstraction and use by the project may put pressure on water sources and resources. Such a water problem may occur if the abstraction and use will not take into account downstream users. Paddy irrigation scheme in Rungwe mpya in Kasulu District - Kigoma Tanzania are examples of downstream users who are likely to be affected by the project if appropriately planned abstraction of water will not be in place and followed.

Mitigation measures

- Develop alternative sources of water
- Share water sources with local communities
- Use water sparingly
- Support local catchment conservation measures

✓ Impacts on Occupation Health and Safety

Common activities undertaken during construction such as the movement of heavy machinery, demolition and excavation, electrical works, handling of chemicals, and works undertaken at height, can all introduce significant risk to the health and safety of the construction work force. Associated risks from accidents and incidents could affect health and safety of the workers and others on construction of stations, sleeper production and batch plants/project sites. Since the location of most of the construction sites would be away from medical centers, improper first aid facilities on the sites could affect health and safety of workers and others.

During the operation of the proposed SGR project will include the physical hazards, chemical hazards and noise physical hazards. Chemical hazards in railway operations and maintenance personnel can be exposed to a variety of physical hazards from operating machinery and moving trains but also working at elevation on bridges and overpasses. Operation of the railway line, which may potentially result in impacts such as the generation of noise and vibration, release of chemicals, fuels or hazardous substances leakage from the freight traffic, killing of crossing animals, generation of various waste streams; and maintenance activities of the trains/track or electrification system, which may potentially result in impacts such as on the occupational health and safety for the workers that will perform regular maintenance of the railway and public safety during the maintenance.

In addition, during operations workers could be exposed to a range of risks and hazardous activities and work environments that could affect human health. Risks and hazards include those associated with the movement of rolling stock, the running and maintenance of the rail engines, and the loading and unloading of materials from the trains. Workers may also be exposed to fumes and chemicals involved in the running of the trains or in maintenance and cleaning. Workers involved in rail maintenance activities may also be exposed to hazards and human health risks comparable to those involved in construction, as well as the risk of being struck by trains when conducting maintenance activities on or near to the rail line.

As the project includes train stations that will operate as buildings open to the public, there would be an operation phase impact on disabled people if they were not designed with due consideration to the needs of disabled people, both in terms of emergency evacuation and provisions of universal access. The receptor of this impact will principally be the skilled and semi-skilled workers employed in long-term roles during the operation phase, but also the local labourers and small-scale traders who are seeking employment opportunities as part of short-term or contracted maintenance works.

Mitigation measures

- Ensuring compliance with the Occupational Safety and Health Act 2003 Practice and guidelines
- Carry out comprehensive risk-based job safety/hazard analysis for all operational tasks implement risk management measures in accordance to international best practices
- Implementation and on-going review of OHS management plans to ensure relevance and best practice at all times
- Ensuring site design takes into account health & safety considerations;
- Ensure adequate fire detection and response measures are put in place including the identification and labelling of suitable exits;
- Ensure provision of trained first aid staff on site at all times and appropriate siting of first aid stations and equipment;
- Equipment to be designed/purchased to minimize risks of accidental human entanglement in moving parts;
- Provision of suitable PPE to protect sight, hearing, skin and respiratory systems etc;
- Provision of adequate lighting and ventilation in all areas;
- Provision of adequate toilet and shower facilities and clean eating area;
- Ensure all staff and visitors are provided with adequate basic OHS training and orientation;

✓ Impacts on community health and safety

Community health, safety and security issues will emerge during the construction of SGR, particularly at large construction sites. The impacts will include dust, noise, and vibration from construction vehicle transit, and communicable disease associated with the influx of temporary construction labor. Significant community health and safety issues associated with the proposed project will include pedestrian safety and traffic safety.

Pedestrians and motor cyclists are at greatest risk of serious injury from collisions with moving vehicles. Children will generally be the most vulnerable due to lack of experience and knowledge of traffic related hazards, their behavior while at play, and their small size making them less visible to motorists. Collisions and accidents can involve a single or multiple vehicles, pedestrians or motor cyclists and animals. Many factors contribute to traffic accidents. Some are associated with the behavior of the driver or the quality of the vehicle, while others are linked to the railway design, or construction and maintenance issues.

Labor influx for construction of the SGR project is likely to increase risk of communicable diseases and burden on local health services: The influx of people may bring communicable diseases to the project area, including Covid 19, cholera and other sexually transmitted diseases (STDs). Also, incoming workers may be exposed to diseases to which they have low resistance. This can result in an additional burden on local health resources. Workers with health concerns relating to substance abuse, mental issues or STDs may not wish to visit the project's medical facility and instead go anonymously to local medical providers, thereby placing further stress on local resources.

Mitigation measures

- Ensure that prior to all activities, the Project shall assess the risks of the works to local people including people walking by, people using nearby roads..
- Ensure that all hazardous materials and equipment must be contained and access to them by local people must be prevented.
- Put barriers and warning signs around open excavations to prevent people falling into them
- Put barriers and appropriate signage to prevent access to other hazardous areas, including areas in which equipment and vehicles are operating.
- Where appropriate, flag persons shall be used to minimise risk to community members in areas of activity and where vehicles enter / exit the Project site.
- Undertake visual inspections to confirm that nobody has entered the site and is in a hazardous location, e.g. people sleeping under equipment.
- Store project materials and equipment securely stored to reduce the risk of theft or use as play areas for children

✓ Impact on Gender Based Violence and Harassment (GBVH)

The mobilization and construction phases will involve several activities including land acquisition, recruitment of labour and site clearance. IFC Performance Standards 2 emphasize on Non-Discrimination and Equal Opportunity and requires the project proponent not make employment decisions on the basis of personal characteristics unrelated to inherent job requirements. It also emphasize that employment relationship should be based on the principle of equal opportunity and fair treatment, and will not discriminate with respect to any aspects of the employment relationship.

Women and Land acquisition

Land acquisition is one of the most important activities during mobilization phase. Land will be acquired for the construction of embankment for the track, camp sites, borrow pits, dumping sites, quarry sites, stations and access roads. The AfDB Gender policy requires that gender analysis be an integral part of all Bank's interventions to ensure that such interventions respond to the needs and priorities of both men and women. This requirement is based on the premise that the absence of specific attention to differences between women and men has been shown to result in the exclusion of women or men as participants or beneficiaries of planned change.

Based on the baseline study women's right to own and inherit land is one of the central issues related to women's economic empowerment. In Tanzania and in the project area in particular, access to land is critical for food production and income generation and a source of power and social status (SIDA, 2015); in rural areas many women's livelihoods depend almost entirely on their land. While women have the same rights as men, under Tanzanians law, to own and control land, women rarely buy land (UNA Tanzania, 2017). Customary practices in Tanzania often require women to access land through their fathers, brothers, husbands, or other men (Guardian, 2014). Only 24% of Tanzanian women report that they own land alone or jointly with someone, while a mere 9% of women have sole ownership of a house or land (Tanzania National Bureau of Statistics, 2016). In a situation where women have no power to make decision in relation to land ownership, it is likely that the implementation will affect their livelihoods.

Child labour and school drop out

One of the objectives of IFC performance standard 2 is to protect workers, including vulnerable categories of workers such as children. The PS 2 requires the client not to employ children in any manner that is economically exploitative, or is likely to be hazardous or to interfere with the child's education, or to be harmful to the child's health or physical, mental, spiritual, moral, or social development if employed as per respective government provisions, a child there are procedures to follow to make sure the right of the child will be considered in the project area. Evidence from the ESIA field study show that child labour still persists because children are used in many ways as labour in farming, grazing of livestock, small mining and activities. This limits child's opportunities of go to school and threatens their health. Evidence have also shown that school drop out for primary and secondary school is common along the project area, therefore, if measures to avoid child labour will not be implemented by the project, it is likely that drop out among children will be on increase.

Sexual harassment

The construction industry, particularly of major infrastructure projects, like the proposed SGR project from Uvinza to Kigadye to Msongati and Gitega can be a high-risk environment for GBVH affecting community members, workers and service users. GBVH risks can intensify within local communities when there are large influxes of male workers from outside the area. Such workers often come without their families and have

large disposable incomes relative to the local community, and can pose a risk in terms of sexual harassment, violence and exploitative transactional relationships. These risks are higher where workers come into close contact with the local community, for example on access routes or when living together in remote areas. During the construction phase, workers are also vulnerable to various forms of harassment, exploitation and abuse, aggravated by traditionally-male working environments.

The Intensity of this impact would be moderate during the project mobilization as it would be experienced continuously by project workers and the local communities. The Probability of the impact is Highly probable as the relative poverty of women and children create conditions in which they could be exploited and harassed. The spread of the impact would be to women employed by the project and children in the surrounding communities so the impact is classed as Local. The duration of the impact is moderate-term as it would last for the duration of construction. Based on these assessments, the pre-mitigation significance is moderate and so additional mitigation is required.

Mitigation measures

- TRC should develop anti GBV and anti-sexual harassment policies
 - The contractor should appoint senior focal points with responsibility for ensuring that commitments and policies to prevent GBVH and sexual harassment policies are implemented.
 - The contractor should put in place monitoring systems at the highest levels for regular reporting on GBVH
 - Include requirements around GBVH in codes of conduct, policies and protocols for contractors, including training on policies and procedures once developed.
 - Ensure codes of conduct are publicly disclosed in local languages and are widely accessible to all workers and all groups of people in project areas.
 - TRC should ensure Resettlement Action Plan (RAPs) take into account gender dynamics including GBVH risks at household and community level
 - The contractor should deliver periodic mandatory training on GBVH to all workers, including contractors, subcontractors and core suppliers, as well as relevant consultants and clients.
 - The contractor should engage expertise (e.g. from local women's rights organisations or NGOs working on GBVH) to conduct awareness campaigns to provide information to local communities, such as what is unacceptable behaviour and how to report an incident of GBVH
 - The contractor should develop Child rights protocols
- ✓ **Increasing pressure and encroachment of grazing and pasture land**

As it is shown in the socio-economic baseline, livestock keeping is an important economic along the Uvinza to Kigadye SGR project, particularly in Msebei, Rugwe Mpya, Sogeeni Kwiliba, Ruhita, Lugoma, Katonga, Heru Ushingo and Kigadye villages. The livestock keepers use 'rubaga' system where cattle are temporarily moved to search pasture and water during dry season. Such shifts often result into encroachment to the forest reserves and water catchment's areas for major water sources. Construction of track embankment and development associated facilities will pose increasing threat of grazing and pasture land encroachments. Due to construction activities, employment and improved economy of people around the area may influence land speculation and sales. Some of the area that might be very vulnerable to encroached are stock corridors, grazing and pasture lands because of their proximity to the project alignment and stations.

The intensity of this impact would be moderate and the probability of the impact is probable. The spread of the impact would be throughout the alignment Regional. The duration of the impact is long-term, and therefore at this time impact significance is graded major, the nature of the impact is Negative.

Mitigation Measures

- TRC and contractor to raise awareness about possibility of pasture and stock routes encroachment
- TRC in collaboration with the district councils to facilitate land use plans in areas commonly used by livestock keepers
- TRC and district councils to facilitate preparation of villages by-laws to protect grazing areas

✓ Grazing land fragmentation and disturbance

The SGR alignment and later truck embankment stretches from Uvinza to Kigadye, Msongati to Gitega in Burundi crosses urban and village lands. The project traverses' areas occupied, and traditionally used by livestock keepers for different purposes including grazing, stock routes, water points, sacred sites and settlements. Some villages have prepared land use plan which shows designated areas for grazing. Construction of the railway embankment and other associated facilities will interfere and separate communities and resources communally used by livestock keepers. Given the distance of the alignment, the truck embankment will be adversely impacted and grazing land disturbed and entire fragmentation of grazing and stock routes if appropriate crossing will not be provided.

The intensity of this impact would be high due to critical activities during construction phase of track and embankment. The probability of the impact is probable and the spread of the impact would be throughout the embankment in the entire alignment traversing IP occupied areas in villages and so the extent is categorized as local. The duration of the impact is long-term as the area will be fenced except in areas with appropriate crossing. Based on these assessments, the nature of the impact is

Negative. The duration of the project, appropriateness of the crossing location the impact significance is graded major and so culturally appropriate mitigation measures will be required.

Mitigation measures

- Contractor in consultation with village leaders should design and construct sufficient crossing/underpasses along the proposed SGR line.
- The contractor to ensure that full information is disclosed about project activities and potential impacts on people's rights and livelihood in a culturally appropriate way.
- Provide fair compensation to affected grazing land.

✓ Destruction and contamination of livestock water points

Construction of embankment from Uvinza to Kigadye will pass through areas occupied and used by pastoralists and other livestock keepers. It will traverse water bodies including rivers, standing water like boreholes and water springs. The construction activities such as excavations, site clearance, vehicles movements and transportation of project materials will have adverse impacts especially destruction and contamination of water points and sources currently used livestock keepers. Some of the key sources of water which are likely to be affected or contaminated include Ruchugi and Ruhita rivers.

Mitigation measures

- Contractor should avoid destruction of livestock water points
- Contractor to identify livestock water points located close to project alignment and develop management and restoration plan.
- Contractor to restrict dispose spoil material near or to water points

✓ Restricting access to stock routes and resources

Construction phase especially for track and embankment in this linear project will involve massive site clearance, land acquisition, traffic movements of vehicles and transportation of construction materials and equipment. Another important activity that will happen during this is the fencing of the entire embankment area. The construction and operation of the project will restrict access to stock routes, pastures and water. During the public meetings, livestock keepers raised concerns on how grazing land and water sources for their livestock will be accessed.

Mitigation measures

- TRC to construct appropriate livestock crossing/underpasses along the proposed SGR line after full consultation with the local community leaders.
- TRC to ensure that full information is disclosed about project activities and potential impacts on people's rights and livelihood in a culturally appropriate way.

7.3.2 Impacts related to biophysical environment

✓ Vibration pollution

Mobilization of equipment (**mobilization phase**), construction of access roads and tunnelling (**construction phase**), and transportation of cargo and passengers (**operation phase**) would engage heavy equipment and machines like bulldozers and caterpillars. These activities would definitely be associated with noise and vibration. Ground vibration would be generated either by the static axle loads moving along the track or by the dynamic forces arising from wheel and track irregularities due to project operation, which is likely to continue for many years in the future. The problem is likely to be more severe where the railway is crossing densely populated areas including urban areas where it usually causes subjective discomfort to occupants in nearby buildings or in extreme circumstances, causes damage to buildings or other structures. Vibration would also be an issue in cases where excavations for construction materials takes place relatively close to human settlements. In this case, some of the material sites have been dis-recommended. The vibration impact would therefore be largely direct, highly significant and long-term.

Mitigation measures:

- Ensure infrastructure designs include wide sleepers in combination with soft under sleeper pads and rail fastening systems with soft under rail pads (<http://www.rivas-project.eu>)
- Use high-quality, continuous smooth tracks.
- Use purpose-built resilient fastenings to attach the new tracks directly to the structure
- Use rubber insulators under the track to dampen vibrations. (levelcrossings.vic.gov.au).
- Implement a communication plan to liaise with potentially affected community stakeholders and land owners regarding potential noise and vibration impacts prior to works occurring.
- Avoid the use of construction material sources relatively too close to human settlements.

✓ Noise pollution

During **mobilization and construction phases**, noise levels at project sites and surrounding areas would increase as a result of borrow/quarry and earthwork activities that are likely to be within or close to human settlements, and construction activities which will involve use of heavy machines and equipment. These may include compaction machines, heavy duty vehicles bringing material at site, concrete mixers, drilling and blasting machines, crushing and screening of ballast materials, welding machine, iron and timber cutting machines, etc. Thus, substantial noise would result for example when welding, grilling, cutting timber or iron and when vehicles are unloading building materials like sand, gravel, etc.

Excessive noise will affect project workers and railway side communities. The noise impact associated with construction work will be short term and will end after construction activities. However, long term impact of noise will be felt during **operation phase** associated with movement of train locomotives particularly to communities residing along the railway corridor.

Mitigation measures

- Provide construction workers with appropriate PPEs like earplugs, or earmuffs and train them in their use
- Ensure regular servicing of construction equipment and trains
- Use equipment that meet Tanzania and Burundi noise pollution standards
- Confine construction activities to core project area
- Install noise barriers in sensitive/ populated areas
- Where alternatives exist, avoid acquisition of burrow/quarry sites within or close to human settlements

✓ Change in surface run-off

Clearance of railway right-of-way (ROW) during **mobilization phase** and construction of access roads would directly expose bare soil to surface run-off and erosion (particularly if done during the rains). Also, trampling and soil compaction due to the use of heavy equipment and machines like bulldozers and caterpillars would directly contribute to impaired ground water infiltration and increased surface run-off. Such impacts would largely be associated with mountainous areas e.g., around Rutana area in Burundi and in areas of Heru Juu in Kasulu district in Tanzania. The impact would largely be residual and could contribute to flush flooding of receiving water bodies during the rainy season. However, the impact would be significant and short-term.

Mitigation measures:

- Natural vegetation should not be removed unnecessarily and should be confined to designated areas
- Ensure project activities are confined to designated areas.
- Ensure re-vegetation of affected areas after construction using native/ indigenous species

✓ **Removal of overburden**

Clearance of ROW, sites for workers' camps, railway stations and terminals and related infrastructure (**Mobilization phase**) and construction of railway embankment would generate substantial vegetation spoil material. In addition, soil overburden may have to be removed in some areas along the railway stretch with black cotton soil before construction of railway embankment. Typical areas include the Malagarasi valley and floodplain both in Tanzania and Burundi. If not appropriately disposed, or if left unattended for a long-time overburden may become an environmental and health hazard (as a source of contaminants) and an eye sore. The impact would be significant and short-term.

Mitigation measures:

- Stored soil overburden should be bounded (to confine it to the designated area), and regularly wetted (during the dry season) to minimize wind erosion and pollution
- Use overburden soil to rehabilitate designated exhausted borrow pits and quarry sites
- Use appropriate top soil for landscaping
- Convert woody biomass into timber and where feasible, energy by thermal technologies like combustion and gasification.

✓ **Change in rivers and streams morphology**

Direct modification of channel morphology of rivers/streams is likely to be associated with the railway project as primary impact due to erosion of exposed soils from railway corridor and site clearance (**mobilization phase**), construction of access roads, bridges and culverts, and railway embankment (**construction phase**). The soils eroded in highland/mountainous areas would be deposited further downstream in the low-lying areas of the rivers (sedimentation) as secondary impacts thus, modifying stream/river morphology by disrupting channels, diverting stream flow and changing the slopes or banks stability of channels as tertiary impacts. Increased sedimentation may also decrease the depth of streams, resulting in greater risk of flooding during times of high-water flow. Sediment deposited on a clean and swift riverbed can cause smothering of benthic organisms, eliminating important food sources for fish and other aquatic organisms.

Secondary environmental impacts of modified stream channel morphologies for rivers within the project impact area include curtailing upstream spawning migration of the potamodromous fish species; reducing breeding success of fish requiring swift well oxygenated gravel sites and; declining fishery in receiving lakes and rivers. This impact would be particularly related to the railway crossing major rivers such as the Malagarasi. The impact would be significant and short-term.

Mitigation measures:

- Ensure that design of bridges and culverts is based on detailed studies and understanding of catchment characteristics and dynamics
- Install and maintain functional sediment control structures to reduce sediment load into receiving water bodies
- Re-vegetate cleared railway corridor areas using indigenous species

✓ **Habitat loss and /or Alteration**

Operational safeguards (OS 3) recognize that the construction and maintenance of railway right of way may result in alteration and disruption to terrestrial and aquatic habitat. The development of Marshalling yard in Uvinza and various stations in Uvinza, Mutinde, Kasulu, and Shunga (border station), and their associated freight yards in will cause loss of habitat and /or cause alteration of habitat particularly in wetland areas (crossing Ruchugi, Mgera and Malagarasi Rivers) and those within protected areas. Similarly, site clearance for the of vegetation for establishing SGR wayleave, construction of marshalling yard, stations and freight yards and associated facilities will remove terrestrial vegetation that are habitats for large to small mammals as well as birds contributing to loss and /or alteration of habitats. Total land area that will be removed from Masanza forest reserve PAs for the purpose of establishing SGR wayleave will be approximately 18000 m² equivalent to 1.8 km².

The loss of habitat and or alteration is considered moderate, with its extent of spread is local and short-term during mobilization and construction phase of the project. The overall impact is considered moderate without mitigation measures and when properly mitigated its impact can be reduced to minor.

Mitigation measures

- Ensure minimum footprint along the alignment by confining construction work within the acquired project areas (Stations, Marshalling Yard & Freight yard) by
- Avoid identified sites that appear to be important wildlife crossings with high diversity of plant and animal species
- Enforce laws governing protection of rare endemic and endangered species
- Ensure habitat restoration throughout the project footprint,
- Prepare and implement a Biodiversity Action Plan (BAP)

✓ Damage to/or Alteration of wetland areas

The sites earmarked for construction of Uvinza-Kigadye SGR as well as associated infrastructures are crossing wetland areas. Three important wetlands are crossed by the proposed SGR project; Rungwe mpya River, Ruchugi River and Malagarasi River. These wetlands are home to aquatic life. Site clearing activities taking place during mobilization and movement of machines and vehicles within the site will likely drain the wetland and damage and /or alter the habitat characteristics of these sites. Also, during construction of b ridges and culverts crossing these wetlands may cause alteration of some of the wetlands and disrupt their ecological functions. Impact evaluation has considered the intensity of damage to wetland by the project as high given the size of wetlands to be crossed and the numbers. The extent of spread for Malagarasi wetland is trans boundary while impact on Ruchugi and Rungwe mpya River may have impacts felt up to the lake thus affecting trans boundary lake. Therefore, implementation of construction activities may permanently alter wetland habitats. The probability of occurrence for alteration and damage to wetland habitat during mobilization and construction phase is definite permanent and irreversible but the risk is rated as high due to the size impacted and its effects being trans boundary.

Mitigation measures

- Identified critical resources available in the areas to should be conserved
- Implement stratification approach on extraction of materials starting with less habited section
- Confine construction activities to the core areas
- Prepare wetlands restoration and rehabilitation plan
- Undertake frequent monitoring to ensure resumed functioning of the wetland ecosystems along the alignment

✓ **Biodiversity loss**

Loss of biodiversity will result from cumulative impacts of site clearing, habitat fragmentation, habitat loss and /or alterations and spread of invasive species and direct kills from trampling and accidents. Biodiversity loss resulting from mobilization works on chosen sites for construction of the SGR Uvinza –Kigadye. The alignment crossing Masanza forest reserve, wetlands at Ruchugi River, Rungwe mpya and Malagarasi have proved to harbour significant population of fauna as described in baseline condition. Significant loss to biodiversity will also contribute to loss of species recognized by IUCN as vulnerable. Masanza forest reserve has records of elephants visiting during wet season from Uvinza Ranch connected to Muyowozi game reserve. Elephants (*Loxodonta africana*) (EN), Leopards are vulnerable (VU) Giant Pangolin *Smutsia gigantea* (EN), Zebra *Equus burchellii* (NT), Lion *Panthera leo* (VU), and Spotted Hyena *Crocuta Crocuta* (V) under IUCN were recorded thus, triggering OS 3 and PS 6 criterion 1 to 3. Similarly plant species with conservation status such as *Pterocarpus tinctorius* CITIES III, *Dalbergia melanoxylon* (NT, CITIES II), *Polystachya setifera* (EN) were recorded. Biodiversity loss resulting from construction of Uvinza – Kigadye was evaluated to be moderate with local extent of spread and long-term.

Mitigation measures

- Confine construction work within the acquired project areas
- Avoid identified wildlife movement corridors, crossings and wetland sites that harbour high abundance of plant and animal species
- Enforce laws governing protection of rare endemic and endangered species
- Prepare and implement an invasive species eradication plan in all areas impacted within the Project area
- Prepare and implement a Biodiversity Action Plan (BAP)
- Screen sources of construction materials by identifying all organism on identified sources
- Ensure habitat restoration throughout the project footprint,
- Implement monitoring and evaluation programs to ensure minimum footprint beyond construction sites

✓ **Risk of increased spread of Invasive Alien Species Infestation**

Risk of spread of invasive species is likely to be a significant impact on Uvinza – Kigadye SGR construction work involving collection of construction materials from different sources identified some of which are likely to be on farmlands, grazing areas and others close to settlement areas already affected by different types of invasive species. Site visit and literature survey recorded a number of invasive species within the project areas, the most recorded invasive species is *Leucaena leucocephala* a tree species used as fodder for livestock, *Lantana camara*, *Argemone Mexicana* and *Opuntia vulgaris*. Construction work involving movement of vehicles and machines from

one locality to another will contribute to spreading of these invasive species and others into areas that are less infested. Invasive species tends to dominate other plant species creating mono-dominant species which in turn affect biodiversity. Impact evaluation characterizes risks of spread of invasive species as low during mobilization, with extent of spread being local and short term since the species was recorded in few localized areas.

Mitigation measures

- Identify section affected by invasive species
- Prepare invasive species eradication plan in collaboration with experts
- Screen sources of construction materials by identifying all organism on identified sources
- Dispose spoil material to designated site
- Mechanical removal invasive species in all areas encountered

✓ Deforestation and habitat fragmentation

Construction of railway project in identified locations will cause deforestation and habitat fragmentation resulting from vegetation clearance. As noted in the baseline condition section the project area traverses in well vegetated area with significant number of protected areas. The first 3 km of the corridor runs through Masanza forest reserve which is contiguous with Mkuti north and Lugufu northwest of Masanza. South of the zero km for the Uvinza –Kigadye line is the Uvinza south forest reserve. The presence of the reserves in the areas makes the uvinza zone a critical habitat analysis site as discrete management unit (DMU). These forests are characterized by miombo woodland forming falling under transition between Zambebian regional centre of endemism and Guinea – Congolese centre of endemism which are part of the Greater African Subequatorial Savannas & Mixed Woodlands (AT11). Vegetation clearing in these areas will deforest the area and cause habitat fragmentation. Deforestation and habitat fragmentation caused by establishment of named facilities will add to already fragmented forest caused by ongoing clearance for farming, establishment of settlement and grazing area and charcoal burning. Clearance of the vegetation in once continuum habitat will fragment and isolate species benefiting from continuum habitat and making them vulnerable to extinction.

Mitigation measures

- Vegetation clearance should be confined only to necessarily designated sites
- Valuable timber removed from woody biomass be made available for public consumption
- Collaborate with TFS to establish afforestation program around the project using local indigenous species
- Designate forested area for conservation to compensate the anticipated loss (offsetting the impact)

✓ Risk of interference of wildlife movement corridors

Risk of interference with wildlife movements will be a significant impact for Uvinza – Kigadye SGR as the alignment and Mutinde station are located in area where wildlife movement and crossing were noted. The area between Basanza villages to Kaguruka was identified as potential elephant crossing corridor. Elephants from Muyowozi game reserve moves into Uvinza wildlife ranch moves across the railway corridor into Mkuti forest-Lugufu and Masanza forest reserve. Construction of various components of the project will interfere and possibly blocked wildlife movement across the project area. Location of Uvinza –Kigadye SGR separates Uvinza wildlife ranch which connects to Muyowozi Game reserve on the eastern side and Mkuti, Lugufu and Masanza forest reserves on the western side. Since the SGR corridor will be fenced it will block elephants from movement between named protected areas. The impact significant is rated as major without mitigation measures, however with implementation of proper mitigation measures the impact can reduced to moderate

Mitigation measures

- Contractor to opt for viaduct or super-bridge flyover of an average of 18 m in area identified as crossing
- Confine construction work within the acquired project areas
- Avoid identified wildlife movement corridors, crossings and wetland sites that harbour high abundance of plant and animal species
- Prepare and implement a Biodiversity Action Plan (BAP)
- Screen sources of construction materials by identifying all organism on identified sources
- Implement monitoring and evaluation programs to ensure minimum footprint beyond construction sites

✓ **Loss /reduction of Ecosystem Services**

OS 3 recognizes that loss of ecosystem services and /or access to ecosystem services valued by human emphasizes loss of biodiversity resources. Implementation of construction of Uvinza-Kigadye SGR on identified locations contributes to clearing of vegetation that offer habitat service to fauna species, denies grazing ground, provide sources of firewood and construction materials to the local communities residing along the SGR corridor. Baseline analysis revealed that large part of the project area is well covered by vegetation ranging from miombo woodland, open grassland, wetland to farmlands. Presence of natural habitats like miombo woodland which have confirmed to harbour abundant wildlife as presented in baseline section. Similarly baseline survey has noted local community benefiting from different types of ecosystem services, firewood collection, construction materials (bamboo), fishing, rids harvesting, grazing, charcoal burning and farming on wetlands and other natural areas acting as source of livelihood. Significant numbers of beekeeping farming which depends solely on the forested areas around the community were noted near Mati Mubondo, Masanza, Kaguruka and Rungwe mpya. Vegetation clearing for establishing of SGR will affect ecosystem services along the SGR corridor benefiting the communities. The impact significant is rated as moderate without mitigation measures; however, with implementation of proper mitigation measures the impact can reduced to minor.

Mitigation measures

- Prepare and implement livelihood restoration plans based on forest conservation that benefit communities
- Prepare and implement a Biodiversity Action Plan (BAP)
- Ensure habitat restoration throughout the project footprint,
- Implement monitoring and evaluation programs to ensure minimum footprint beyond construction sites

✓ **Soil erosion**

Soil erosion is expected almost during all phases of the project (i.e. mobilization, construction, operation and decommissioning). Site clearance, removal of soil overburden, actual embankment construction, cut and fill section of the rail, crossing rivers, streams, steep slopes and especially on escarpment as well as management of workers camp will trigger erosion and siltation of receiving water bodies. Significant erosion will occur when construction is done on the mountain slopes because of the steep gradient and unconsolidated soils, especially if construction is done during the rainy season.

Cut and fill effect along the railway, creation of drainage channels and hardening of the rail embankment itself will create a lot of surface runoff which will accelerates soil erosion and landslides especially on steep slopes. The section between Mutabila Military area, Shunga village and toward the border with Burundi the hilly terrain characterizing the corridor will result into significant soil erosion. The cut edges of the hills and the slopes where drainage channels empty water collected from other

channels and culverts will cause significant erosion engendering the sustainability of the rail itself.

Mitigation measures

- Stabilize the slope edge according to contours and revegetation using indigenous plants species
- Adopt engineering design that dampen or break the power of flowing water current where drainage empty water to the environment
- Use of pitched stones and wire mash to control soil erosion on vertical edges
- Cut and fill slopes shall be kept gentle less than 450 to minimize landslides
- Stored soil overburden should be bounded (to confine it to the designated area), and regularly wetted (during the dry season) to minimize wind erosion
- Install and maintain sediment control structures to minimize surface runoff prior to discharge to receiving surface water bodies

✓ Change in landscape and scenic quality of the area

Implementation of various activities of the project along the railway corridor will contribute to change in landscape and scenic quality of the area. activities like clearing of vegetation along the corridor, cut and fill section on slopes and river valley, extraction of construction materials, establishment of access roads, accumulation of overburden soil removed from the corridor and movement of machines and equipment on site these will change the scenic and landscape of the project area. The most significant impact will occur during construction; however, during operation the change in landscape and scenic quality will be significant in specific sections of the corridor.

Mitigation measures

- Confine the project activities within designated core areas
- All construction materials shall come from screened/pre-selected source
- The exposed slopes shall be revegetated using indigenous plant species to maintain the natural environment

✓ Air pollution and contribution to climate change

The main contributor to climate change related to this project is air pollution emanating from emission of greenhouse gases (GHG) from operating engines and machines during both construction and operation phase of the project. The big concern lies on greenhouse gases emissions from fuel use causing environmental pollution in town and cities given the synergistic effect of emission from vehicles in cities. Similarly, other forms of waste would be generated from the construction of rail and operation of trains within the corridor, thus contributing to environmental pollution. Operation of locomotives in the railway corridor powered by diesel engine will have long term

contribution to air pollution particularly GHG emissions resulting from the use of diesel fuel. Connected to levels of GHG generated is the reduced vegetation cover due to establishment of railway corridor and construction of associated infrastructures, intensification of agriculture and mining activities stimulated by improved infrastructures/ transportation will reduce the vegetation cover that would help sequester GHG generated to counteract the generation levels.

Mitigation measures

- Establish green belt using indigenous plant species to maintain the natural environment and act as greenhouse sink for GHG
- Regular maintenance of train engine to minimize GHG emission
- Consider more environmentally friendly energy sources

✓ Damming/Ponding effect

The construction of railway embankment particularly on lowlying and flood prone areas will create a ponding effect as the embankment will create a barrier to otherwise free flowing water. Creation of barrier for free moving water will cause damming effect and flooding on the water receiving side of the the embankment. Associated with damming effect is the bullet effect caused by retained water forcing their way out of the small culvert, as a result the force created by water erode the emptying side of the embankment. The area foreseen to be most likely affected are the area between Mtabila – shunga.

Mitigation measures

- Establish series of well-designed culverts to allow free movement of water across rail embankment
- Ensure that design of bridges and culverts is based on detailed studies and understanding of catchment characteristics and dynamics
- Adapt engineering design to avoid damming effects and excessive use of construction materials in all low lying and flood prone areas

✓ Disruption of road and public utilities/infrastructures

Construction of railway embankment and other railway infrastructure like communication system will disrupt existing infrastructure such as water system, telecommunication, optical cable, power transmission and sewerage system especially in urban setting. The most significant impact will be felt during construction phase of the project and cause serious inconveniences to local communities. According to the current railway design there are several level crossing areas, several under pass crossing as well as over pass section (viaducts).

Mitigation measures

- Provide signage for railway crossing
- Provide appropriate compensation for affected public utilities and infrastructure
- Undertake appropriate engineering designs for under passes or over passes where appropriate

✓ Liquid waste generation

Substantial liquid wastes would be generated during all phases of the project (**mobilization, construction, operation and decommissioning**). Generated liquid wastes shall include domestic waste from offices, working station, working camps and passengers in the train and train stations. Also, hydrocarbon waste from lubricant of the machine, waste fuel, oil and grease washed from train, maintenance depots and refuelling will add to the liquid waste generated during various phase of the project. Generally, wastewater constitutes about 80% of amount water consumption; thus, in workers camp, stations, workshops and number of passengers and staff in the train will determine the amount of water required and therefore the amount of waste water generated. Poor management of these wastes would not only expose the workers and other people to hazardous wastes and poor sanitary conditions but, may pollute soil, surface and ground water sources.

Mitigation measures

- Use of mobile toilets or soak away/septic tanks treatment systems (whichever is applicable) in work stations and worker's camps respectively
- Use soak away/septic tanks treatment system in remote stations
- Connecting to available urban liquid waste system or establish own treatment system in major cities and towns

✓ Solid waste generation

Solid wastes would be generated during all phases of the project (**mobilization, construction, operation and decommissioning**). Site clearance would generate large quantities of woody vegetation biomass and top soil overburden. Additional solid wastes would include garbage (food wastes), rubbish (paper, cardboards, wood, tree leaves and branches, bottles, metals, plastic materials, drums, containers, construction materials, packaging materials, iron scrap material, absorbable pads and oil sags). Others are medical or clinical wastes from first aid and health facilities including medicines sharp objects (e.g. needles) in working and camp site. These solid wastes need to be handled properly not to cause harm to human and environment.

Per capita solid waste generation of person 0.31 kg/day and approximately 800 workers employed by the project; thus about 248 kg of solid wastes would be generated daily so that it is about 7.4 tons per month during the **construction phase**. Amount of solid waste produced during operation of the project will be determined by number of

passengers, number of workers and the activity conducted in the station and workshops. During decommission of the project, solid waste produced will be spoil material such iron scraps, railway bars, soil, wheels can be recycling to produce another material.

Mitigation measures

- Provide adequate litter bins at work place
- Sort and dispose solid waste appropriately
- Raise awareness to workers/staff/passengers on environmental and safety issues
- Use overburden soil to rehabilitate exhausted borrow pits and quarry sites within the corridor

✓ Surface water and soil pollution

Substantial chemical and physical pollution of surface and ground water quality of surrounding streams and rivers around the project area will be impacted. Physical impacts like increased turbidity due to increased sediment load will result from mobilization and construction activities such as vegetation clearance, soil erosion construction of access road and bridges particularly on slopes and valleys on rivers and other small streams crossing the railway corridor in various places. Similarly during operation phase of the project water and soil pollution will come from possible leakage, or spillage of Hydrocarbon waste from lubricant of the machine, waste fuel, oil and grease. Waste water from the mechanical repair and flushing mobile machinery have potential negative impact to the surface and ground water. Similarly, demolition of structures and management of spoil during project closure (**decommissioning phase**) would be a source of significant and direct impairment of local surface and ground water quality.

Mitigation measure

- Use approved or environmentally acceptable chemicals substances for cleaning train
- Provide oil traps to oil depot stations, workshops and bridge crossing rivers
- Structure for railway crossing rivers and should be appropriately sealed underneath to capture oil leakages
- Regular maintenance of train engines to minimize oil leakage
- Appropriate disposal of the waste oil collected from oil traps and workshops

✓ **Increased accidents, risks and hazards**

Construction of the proposed railway line will include undertaking a number of activities involving mechanical operations of heavy machines and equipment which are susceptible to accidents, risks and hazards. The risks and hazards will also take place during the mobilization phase especially in relation to long howling distances of construction materials from distant burrow/quarry sites. The impact is expected to be significant but short-term.

The high potential areas for accidents, risks and hazards include Rungwe Mpya around the flood plain, Malagasi River crossing where construction of railway line would involve use of a number of viaducts and extensive bridges. During project operation the risk and hazards will also be associated with oil spills at stations, workshops and bridges which may result in pollution of water and soil.

Mitigation measures:

- Provide training on relevant safety measures, first aid procedures and emergency response to workers.
- Provide full package of first aid kit at work places and workers' camps
- Provide and enforce use of PPEs
- Put warning signs in dangerous corners, animal crossings and other risk areas
- Use approved and environmentally acceptable chemical substances for cleaning trains
- Regular maintenance of train engines to minimize oil leakage
- Provide oil skimmers at all designated maintenance bays and dispose through registered oil collectors
- Discharged waste water to meet Tanzania and Burundi water quality standards

CHAPTER EIGHT

8 ENVIRONMENTAL AND SOCIAL MANAGEMENT PLAN

8.1 Introduction

Environmental and Social Management Plan (ESMP) will involve undertaking mitigation or enhancement activities during mobilization, construction, and operation phases of the project. These activities are designed to eliminate, offset, or reduce adverse environmental impacts to acceptable levels and enhance positive ones. An ESMP therefore describes the mitigation management required to ensure proper implementation of agreed mitigation measures and verification of predicted environmental impacts. Ideally, the plan is part of the documentation used for consultation and decision-making and can be used by the ESIA Agency to specify conditions to be met by the developer when implementing the project (i.e., environmental certification).

The proposed impact mitigation/enhancement plan for the proposed Uvinza – Kigadye railway is summarized in table 24. The table indicates the predicted impact, proposed mitigation measures time frame to implement any intervention, it also shows the responsible institution for implementing the plan, the opportune time for undertaking each mitigation/enhancement measure and cost estimate for implementing the mitigation/enhancement measures. It is anticipated that the developer will set aside these funds to implement the mitigation and enhancement measures highlighted in the plan.

Table 8-1: Environmental and Social Management Plan for Uvinza Kigadye Railway Project

A) Socio-Economic environment

Positive impacts					
1	Increased employment opportunities	<p>Give employment priority to the local communities with relevant skills based on gender</p> <p>Provide on job training to workers</p> <p>Support local technical training institutions to build capacity (skills relevant to the project) to the communities</p>	TRC, Contractor,	During Mobilization, construction and operation	30,000
2	Increased government revenue generation	<p>Ensure allocation of sufficient financial resources for implementation of the project (e.g. through PPP, Bank loans, own funds)</p> <p>Ensure timely implementation of the project</p> <p>Improve security of the railway facilities to attract more customers</p> <p>Improve tax collection mechanisms within the railway catchment</p>	TRC	During Construction and operation	40,000
3	Improvement of local economy	<p>Promote economic linkages with railway line</p> <p>Provide incentives to various productive sectors and</p>	TRC,	During Mobilization, construction and operation	TBD

		<p>entrepreneurs such as loans for investments</p> <p>Set affordable railway transportation costs</p> <p>Promote availability of markets for goods</p> <p>Promote small scale food processing industries for value addition</p>			
4	Enhanced Regional Trade	<p>Ensure timely implementation of the project to high standards</p> <p>Ensure allocation of sufficient financial resources for implementation of the project</p> <p>Effective implementation of the trade protocols</p>	TRC	During Construction and operation	20,000
5	Improved transportation system	<p>Improve security at the port and on-transit</p> <p>Promote industrial development in the railway catchment area</p> <p>Ensure allocation of sufficient financial resources for implementation of the project (e.g. through PPP, Bank Loans, own funds)</p> <p>Ensure regular maintenance of the railway line</p> <p>Promote economic linkage with railway line</p>	TRC	During Operation of railway	40,000

		Establish effective institution arrangement to manage the railway			
Negative impacts					
1	Loss of land and other properties	<p>Provide detailed information to affected persons about their rights/ options pertaining to land acquisition</p> <p>Provide fair prompt and effective compensation at full replacement cost</p> <p>Acquire only land necessary for the proposed project (including access roads)</p> <p>Confine construction and operation activities within designated wayleave</p>	TRC	During Mobilization and construction	1,495704.61
2	Disruption of public infrastructures and other utilities	<p>Provide fair and prompt compensation for affected public utilities and infrastructure</p> <p>Undertake appropriate engineering designs for under passes or over passes where appropriate</p>	TRC Contractor	During Mobilization, Construction and operation	TBD
3	Increased Level of crime and insecurity	<p>Sensitize workers and surrounding communities to implement measures to protect railway.</p> <p>Provide reliable escort and security for the project goods and facilities.</p>	TRC	During Mobilization, construction and operation	50,000

		Involve the local community in the maintenance and management of new infrastructures to ensure their sustainability.			
4	Change in Demographic characteristics	<p>Use local labour taking into account relevant skills and gender</p> <p>Provide reproductive health education</p>	TRC	During Mobilization, construction and operation	60,000
5	Accidents, risks and hazards	<p>Provide training on relevant safety measures, first aid procedures and emergency response to workers.</p> <p>Provide full package of first aid kit at work places and workers' camps</p> <p>Provide and enforce use of PPEs</p> <p>Put warnings signs in dangerous corners, animal crossings and other risk areas</p> <p>Use approved and environmentally acceptable chemical substances for cleaning trains</p> <p>Regular maintenance of train engines to minimize oil leakage</p> <p>Provide oil skimmers at all designated maintenance bays and dispose through registered oil collectors</p>	TRC Contractor	During Mobilization, construction, operation and decommissioning	60,000

		Discharged waste water to meet Tanzania and Burundi water quality standards			
6	Increased land use conflicts	<p>Effect prompt and fair compensation for the lost land at full replacement cost</p> <p>Raise awareness to the local communities on land ownership and compensation issues</p> <p>Establish proper grievance redress mechanisms</p> <p>Prepare and enforce land use plans</p>	<p>TRC</p> <p>Contractor</p> <p>Provincial/commune land officer (Burundi)</p> <p>Governors</p>	During Mobilization and Construction	TBD
7	Change in land values	<p>Acquire only land that is needed for the project development.</p> <p>Raise awareness to local people not to sale land haphazardly</p> <p>Develop and enforce policies that will prevent speculators</p> <p>Put measures to control land prices</p>	TRC	During Mobilization and construction	80,000
8	Noise pollution	<p>Provide construction workers with appropriate PPEs like earplugs, or earmuffs and training them in their use</p> <p>Ensure regular servicing of construction equipment and trains</p> <p>Use equipment that meet Tanzania and Burundi noise pollution</p>	<p>TRC</p> <p>Contractor</p>	During Construction and operation	40,000

		standards Confine activities to core project area Install noise barriers in sensitive/populated areas			
9	Increased rate of HIV/ STDs	Provide awareness on HIV/AIDS and other communicable diseases. Provide Voluntary Counselling and Testing (VCT) centres for HIV/AIDs at work place, Enforce HIV/AIDS law and regulations that prohibit stigma, discrimination and responsibility of taking care of the affected communities	TRC Contractor	During Mobilization, construction and operation	40,000
10	Pressure on local social services	Support the cost of local social services where necessary Support development of new social services where necessary	TRC Contractor	During Mobilization and construction	100,000
11	Pressure on water resources	Develop alternative sources of water Share water sources with local communities Use water sparingly Support local catchment conservation measures	TRC Contractor	Mobilization, construction and operation	TBD

	Effect on Occupational health and safety	<p>Provide adequate health care facilities (including first aid facilities) within construction sites;</p> <p>Ensure that all construction workers will be trained in basic sanitation, general health and safety matters, and on the specific hazards of their work;</p> <p>Provide Personal Protection Equipment (PPE) for workers, such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection required in accordance with HSE legislation will be provided and used;</p> <p>Provide training/briefing about safety prior to commencement of works in rules for the handling and storage of hazardous substances (fuel, oil, lubricants, bitumen, paint) and cleaning of machinery/equipment will be provided;</p> <p>Ensure International HSE standards are implemented in all contracts.</p> <p>Ensure proper maintenance of vehicles and machinery prior to use to ensure it is in safe condition</p>	Contractor TRC	Mobilization, construction and operation	150,000
12	Impacts on community health, safety and security	Ensure that prior to all activities, the Project shall assess the risks of the works to local people including	Contractor TRC	Mobilization, construction and operation	150,000

		<p>people walking by, people using nearby roads..</p> <p>Ensure that all hazardous materials and equipment must be contained and access to them by local people must be prevented.</p> <p>Put barriers and warning signs around open excavations to prevent people falling into them</p> <p>Put barriers and appropriate signage to prevent access to other hazardous areas, including areas in which equipment and vehicles are operating.</p> <p>Where appropriate, flag persons shall be used to minimise risk to community members in areas of activity and where vehicles enter / exit the Project site.</p> <p>Undertake visual inspections to confirm that nobody has entered the site and is in a hazardous location, e.g. people sleeping under equipment.</p> <p>Store project materials and equipment securely stored to reduce the risk of theft or use as play areas for children</p>	Local Authorities		
13	Impact on Gender Based Violence and Harassment	<p>TRC should develop anti GBV and anti-sexual harassment policies</p> <p>The contractor should appoint</p>	Contractor TRC	During Mobilization, construction and	150,000

	(GBVH)	<p>senior focal points with responsibility for ensuring that commitments and policies to prevent GBVH and sexual harassment policies are implemented.</p> <p>The contractor should put in place monitoring systems at the highest levels for regular reporting on GBVH</p> <p>Include requirements around GBVH in codes of conduct, policies and protocols for contractors, including training on policies and procedures once developed.</p> <p>Ensure codes of conduct are publicly disclosed in local languages and are widely accessible to all workers and all groups of people in project areas.</p> <p>TRC should ensure Resettlement Action Plan (RAPs) take into account gender dynamics including GBVH risks at household and community level</p> <p>The contractor should deliver periodic mandatory training on GBVH to all workers, including contractors, subcontractors and core suppliers, as well as relevant consultants and clients.</p> <p>The contractor should engaging</p>	Local Authorities	operation	
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		<p>expertise (e.g. from local women's rights organisations or NGOs working on GBVH) to conduct awareness campaigns to provide information to local communities, such as what is unacceptable behaviour and how to report an incident of GBVH</p> <p>The contractor should develop Child rights protocols</p>			
14	Increasing pressure and encroachment of grazing and pasture land	<p>Raise awareness about possibility of pasture and stock routes encroachment</p> <p>Facilitate land use plans in areas commonly used by livestock keepers</p> <p>Facilitate preparation of villages by-laws to protect grazing areas .</p>	Contractor TRC	Mobilization, construction	100,000
15	Grazing land fragmentation and disturbance	<p>In consultation with village leaders design and construct sufficient crossing/underpasses along the proposed SGR line.</p> <p>Ensure that full information is disclosed about project activities and potential impacts on people's rights and livelihood in a culturally appropriate way.</p> <p>Provide fair compensation to affected grazing land</p>	Contractor TRC	Mobilization, construction	100,000

	Destruction and contamination of livestock water points	<p>Avoid destruction of livestock water points</p> <p>Identify livestock water points located close to project alignment and develop management and restoration plan.</p> <p>Restrict dispose spoil material near or to water points</p>	Contractor TRC		100,000
16	Restricting access to stock routes and resources	<p>Construct appropriate livestock crossing/underpasses along the proposed SGR line after full consultation with the local community leaders.</p> <p>Provide is disclosed about project activities and potential impacts on people's rights and livelihood in a culturally appropriate way</p>	TRC Contractor	During Mobilization, construction and operation	100,000
17	Impaired local air quality	<p>Establish green belt using indigenous plant species to maintain the natural environment and act as greenhouse sink for GHG</p> <p>Use appropriate PPE (respiratory masks)</p> <p>Sprinkling the work places with water to reduce dust</p> <p>Cover and contain construction materials in trucks and storage places</p>	TRC Contractor	During Construction and operation	40,000

		<p>Confine project activities to core construction areas</p> <p>Ensure regular maintenance of train engines</p> <p>Adhere to Tanzania and Burundi air quality standards</p>			
Impacts on Cultural Heritage					
34	Loss of Iron Age potsherds and Later Stone Age artifacts from archaeological sites	<p>Conduct shovel test pits in workers camp and access roads sites</p> <p>Conduct test excavations in the project area.</p>	TRC Contractor	During Mobilization and construction	50,000
35	Destruction of Iron Age pottery sites and LSA tool sites	Conduct detailed archaeological assessment to retrieve and preserve more archaeological heritage	TRC Contractor	During Mobilization and construction	50,000
36	Destruction of potential CSITR heritage	<p>Avoid erecting any structure such as workers camp in the corridor of the CSITR heritage.</p> <p>Conduct detailed archaeological assessment in the corridor of the CSITR heritage at Kibaoni</p>	TRC Contractor	During Mobilization and construction	30,000
37	Destruction of potential Salt Caravan Route (SCR) heritage	Conduct shovel test pits in the areas where the railway line will cross/pass SCR.	TRC Contractor	During Mobilization and construction	40,000
39	Change in	Sensitize people to keep and respect	TRC	During	30,000

	intangible heritage	their intangible heritage values Promote local intangible heritage values	Contractor	Mobilization and construction	
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B) Biophysical Environment

1	Vibration	<p>Ensure infrastructure designs include wide sleepers in combination with soft under sleeper pads and rail fastening systems with soft under rail pads</p> <p>Use high-quality, continuous smooth tracks.</p> <p>Use purpose-built resilient fastenings to attach the new tracks directly to the structure</p> <p>Use rubber insulators under the track to dampen vibrations.</p> <p>Inform affected community stakeholders regarding potential vibration impacts prior to start of works</p> <p>Restrict major development close to railway way leave</p> <p>Regular maintenance of train engines to minimize vibration</p>	TRC, Contractor,	During Mobilization, construction and operation	40,000
2	Change in surface run-off	<p>Removal of natural vegetation should be confined to designated areas</p> <p>Ensure re-vegetation of affected areas after construction using indigenous plant species</p>	Contractor, under supervision of Engineer	During railway construction	Covered under soil erosion and siltation

3	Management of overburden	<p>Stored soil overburden be bounded (to confine it to the designated area), and regularly wetted (during the dry season) to minimize wind erosion and pollution</p> <p>Use overburden soil to rehabilitate designated exhausted borrow pits and quarry sites</p> <p>Use appropriate top soil for landscaping</p>	Contractor,	During Mobilization and construction	25,000
4	Change in rivers and streams morphology	<p>Ensure that design of bridges and culverts is based on detailed studies and understanding of catchment characteristics and dynamics</p> <p>Install and maintain functional sediment control structures</p> <p>Re-vegetate cleared railway corridor areas using indigenous species</p>	TRC Contractor,	During Mobilization, construction and operation	10,000.
	Biodiversity loss	<p>Confine construction work within the acquired project areas (right of way, sources of material and worker's camps)</p> <p>Designate forested area for conservation to compensate the anticipated loss (offsetting the impact)</p> <p>Collaborate with relevant authorities like TFS, TAWA and LGAs to establish conservation/afforestation program around the project using local indigenous species</p> <p>Prepare and implement a Biodiversity Action Plan (BAP)</p> <p>Contractor to opt for viaduct or super-bridge flyover of an average of 18 m several underpasses within 1km in area identified as</p>	Contractor TRC	During Mobilization, construction and operation	10,000.

		<p>wildlife crossing</p> <p>Provide free access to wildlife movement across the SGR RoW</p> <p>Enforce laws governing protection of rare endemic, migratory and endangered species</p> <p>Screen sources of construction materials by identifying all organism on identified sources</p>			
	Habitat loss and/or alteration	<p>Confine construction work within the acquired project areas (right of way, sources of material and worker's camps)</p> <p>Avoid identified sites that appear to be important wildlife crossings with high diversity of plant and animal species</p> <p>Ensure minimum footprint along the alignment by confining construction work within the acquired project areas</p> <p>Enforce laws governing protection of rare endemic and endangered species</p> <p>Ensure habitat restoration throughout the project footprint,</p> <p>Prepare and implement a Biodiversity Action Plan (BAP)</p>	Contractor TRC	During Mobilization, construction and operation	10,000.
	Damage to/ or Alteration of wetland areas	<p>Conduct special wet season study on aquatic areas including wetland to identify critical resources available in the areas</p> <p>Enforce laws governing protection of rare endemic, migratory and endangered species</p> <p>Confine construction activities to the core</p>	Contractor TRC	During Mobilization, construction and operation	10,000.

		<p>Area</p> <p>Prepare wetlands restoration and rehabilitation plan</p> <p>Ensure restoration & rehabilitation of all sites that will be impacted by SGR footprint,</p> <p>Undertake frequent monitoring to ensure resumed functioning of the wetland ecosystems along the alignment</p> <p>Consideration of bird flying zones in the bird migratory zone</p>			
	Habitat fragmentation	<p>Avoid identified wildlife movement corridors, crossings and wetland sites that harbour high abundance of plant and animal species</p> <p>Contractor to opt for viaduct or super-bridge flyover of an average of 18 m several underpasses within 1km in area identified as wildlife crossing</p> <p>Prepare and implement a Biodiversity Action Plan (BAP)</p> <p>Collaborate with relevant authorities like TFS, TAWA and LGAs to establish conservation/afforestation program around the project using local indigenous species</p> <p>Designate forested area for conservation to compensate the anticipated loss (offsetting the impact)</p>	Contractor TRC	During Mobilization, construction and operation	20,000.
	Increased spread of invasive species	<p>Identify section affected by invasive species</p> <p>Prepare invasive species eradication plan in collaboration with experts</p>	Contractor TRC	During Mobilization, construction and operation	40,000.

		<p>Screen sources of construction materials by identifying all organism on identified sources</p> <p>Mechanical removal invasive species in all areas encountered</p> <p>Dispose spoil material to designated site</p>			
	Risk of interference of wildlife movement corridors	<p>Contractor to opt for viaduct or super-bridge flyover of an average of 18 m in area identified to as crossing</p> <p>Confine construction work within the acquired project areas (Stations, Marshalling Yard & Freight yard)</p> <p>Avoid identified wildlife movement corridors, crossings and wetland sites that harbour high abundance of plant and animal species</p> <p>Prepare and implement a Biodiversity Action Plan (BAP)</p> <p>Screen sources of construction materials by identifying all organism on identified sources</p> <p>Implement monitoring and evaluation programs to ensure minimum footprint beyond construction sites</p>	Contractor TRC	During Mobilization, construction and operation	40,000.
	Loss /reduction of Ecosystem Services	<p>Provide free access to resources across the SGR RoW</p> <p>Prepare and implement livelihood restoration plans based on forest conservation that benefit communities</p> <p>Prepare and implement a Biodiversity Action Plan (BAP)</p> <p>Ensure habitat restoration throughout the</p>	Contractor TRC	During Mobilization, construction and operation	20,000.

		<p>project footprint,</p> <p>Implement monitoring and evaluation programs to ensure minimum footprint beyond construction sites</p>			
	In-migration, increased access and poaching	<p>Provide free access to resources across the SGR RoW</p> <p>Prepare and implement livelihood restoration plans based on forest conservation that benefit communities</p> <p>Collaborate with relevant authorities like TFS, TAWA and LGAs to establish conservation/afforestation program around the project using local indigenous species</p> <p>Prepare and implement a Biodiversity Action Plan (BAP)</p> <p>Ensure habitat restoration throughout the project footprint,</p> <p>Implement monitoring and evaluation programs to ensure minimum footprint beyond construction sites</p>	<p>TRC</p> <p>Contractor</p> <p>Local authorities</p>	During Mobilization, construction and operation	10,000.
7	surface pollution water	<p>Use approved chemical substances for cleaning trains</p> <p>Provide oil traps to oil depot stations, and bridge crossing rivers</p> <p>Ensure regular maintenance of train engines to minimize oil leakage</p> <p>Provide oil skimmers at all designated maintenance bays and dispose through registered oil collectors</p>	<p>TRC</p> <p>Contractor</p>	During Construction and operation	TBD

		<p>Discharged waste water to meet Tanzania standards</p> <p>Raise awareness to workers/staff/passengers on environmental and safety issues</p>			
8	Ground water pollution	<p>Use approved or environmentally acceptable chemical substances for cleaning trains</p> <p>Provide oil traps to oil depot stations, and bridges crossing rivers</p> <p>Regular maintenance of train engines to minimize oil leakage</p> <p>Provide oil skimmers at all designated maintenance bays and dispose through registered oil collectors</p> <p>Discharged waste water to meet Tanzania standards</p> <p>Raise awareness to workers/staff/passengers on environmental and safety issues</p> <p>Regularly empty sanitary facilities and disposing the products in authorized sites</p>	TRC Contractor	During Construction and operation	Covered under surface water pollution
9	Soil pollution	<p>Use approved or environmentally acceptable chemical substances for cleaning trains</p> <p>Provide oil traps to oil depot stations, and bridges crossing rivers</p> <p>Regular maintenance of train engines to minimize oil leakage</p> <p>Provide oil skimmers at all designated maintenance bays and dispose through</p>	TRC Contractor	During Construction and operation	Covered under surface water pollution

		<p>registered oil collectors</p> <p>Discharged waste water to meet Tanzania standards</p> <p>Raise awareness to workers/staff/passengers on environmental and safety issues</p>			
10	Soil erosion and siltation	<p>Stabilize the slope edge according to contours and re-vegetation using indigenous plants species</p> <p>Adopt engineering design that break the power of flowing water</p> <p>Use pitched stones and wire mash to control soil erosion on vertical edges</p> <p>Cut and fill slopes shall be kept gentle i.e. <45° to minimize landslides</p> <p>Stored soil overburden should be bounded (to confine it to the designated area), and regularly wetted (during the dry season) to minimize wind erosion</p> <p>Install and maintain sediment control structures to minimize surface runoff prior to discharge to receiving surface water bodies</p>	TRC Contractor, under supervision of Engineer	During railway construction	50,000
11	Solid waste generation	<p>Provide adequate litter bins at work place, stations and worker's camps</p> <p>Sort and dispose solid waste at designated sites</p> <p>Reduce, recover ,reuse and recycle solid waste</p>	TRC Contractor	During Construction and operation	30,000

		<p>Raise awareness to workers/staff/passengers on environmental and safety issues</p> <p>Use overburden soil to rehabilitate exhausted borrow pits and quarry sites within the corridor</p>			
12	Liquid generation waste	<p>Use mobile toilets or soak away/septic tanks treatment systems in construction sites and worker's camps respectively</p> <p>Use soak away/septic tanks treatment systems in remote stations</p> <p>Provide oil skimmers at all designated maintenance bays and dispose through registered oil collectors</p> <p>Treat and discharge waste water to meet Tanzania water quality standards Raise awareness to workers/staff/passengers on environmental and safety issues</p> <p>Connect to available urban liquid waste system or establish own treatment system in major cities and towns</p>	TRC Contractor	During Mobilization, construction and operation	80,000
13	Disruption of public infrastructures and other utilities	<p>Provide fair and prompt compensation for affected public utilities and infrastructure</p> <p>Undertake appropriate engineering designs for under passes or over passes where appropriate</p>	TRC Contractor ,	During Mobilization, Construction and operation	TBD
14	Damming/ponding effect	<p>Establish series of well-designed culverts to allow free movement of water across rail embankment</p> <p>Ensure that design of bridges and culverts is</p>	TRC Contractor	During Mobilization and construction	TBD,

		<p>based on detailed studies and understanding of catchment characteristics and dynamics</p> <p>Adapt engineering designs to avoid damming effects and excessive use of construction materials in all low lying and flood prone areas</p>			
15	Loss of vegetation	<p>Confine construction activities within core areas</p> <p>Cleared vegetation around offices and workers camps should be re-vegetated using indigenous plant species once construction is over</p> <p>Slopes and edges of the cut hills should be well vegetated with indigenous plant species</p>	TRC Contractor	During construction	20,000
16	Change biodiversity in	<p>All construction materials shall come from screened/pre-selected source</p> <p>Deliberate efforts to manually remove identified invasive species along the project corridor</p> <p>The exposed slopes shall be re-vegetated using indigenous plant species to maintain the natural environment</p>	TRC Contractor,	During Construction and operation	30,000
17	Change landscape aesthetics in and	<p>Confine the project activities within designated core areas</p> <p>All construction materials shall come from screened/pre-selected source</p> <p>The exposed slopes shall be re-vegetated using indigenous plant species to maintain the natural environment</p>	TRC Contractor,	During Construction of railway	Covered under soil erosion and siltation

33	Impaired local air quality	<p>Establish green belt using indigenous plant species to maintain the natural environment and act as greenhouse sink for GHG</p> <p>Use appropriate PPE (respiratory masks)</p> <p>Sprinkling the work places with water to reduce dust</p> <p>Cover and contain construction materials in trucks and storage places</p> <p>Confine project activities to core construction areas</p> <p>Ensure regular maintenance of train engines</p> <p>Adhere to Tanzania and Burundi air quality standards</p>	TRC Contractor	During Construction and operation	40,000
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8.2 Contractor's Specific Requirements for the Uvinza – Kigadye SGR Project

The Specific Environmental and Social Management Plan (ESMP) shall be prepared and submitted to Client for approval prior to the execution of the proposed Uvinza-Kigadye SGR project. The ESMP among others shall include sub-plans such as: -

- Resettlement Action Plan
- Gender Based Violence and Violence Against Children Management Plan
- Influx Management Plan
- Development of an Environmental Health and Safety Plan
- Development of a Project Specific Emergency Response plan
- Development of a Project Specific management Plan
- Development of a Spill Contingency Management Plan
- Completion of a “Bridging” process with contractors to evaluate their EHS procedures.
- The Traffic Management Plan (TMP)
- The HIV/AIDS and COVID 19 awareness programme
- Develop and implement a Biodiversity Action Plan (BAP)
- Develop and implement wetlands restoration and rehabilitation plan
- Develop and implement an invasive species management/eradication plan (ISMP)
- Develop and implement livelihood restoration plans based on forest conservation that benefit communities

8.2.1 Development of Resettlement Action Plan

- When there would be a need to acquire land and do resettlement, the Contractor shall strictly refer to the current Village land acts, 1999; Land act, 1999; Land Acquisition act, 1967; The valuation and valuers registration act, 2016 as well as the Land for compensation regulations of 2001.
- All land to be permanently used or occupied by the Works excluding borrow area, dumping site and quarries will be provided by the Employer. Approval of the Engineer must be sought before entry upon the land.
- In cases of borrow areas, dumping sites, quarries, and temporary works the Contractor shall be required to acquire land on behalf of the Employer and make all necessary arrangements with local authorities and owners or legal occupants of the land. All costs for this arrangement will be paid by Contractor on behalf of the Employer.
- The Employer will refund to the Contractor such payments, as provided in the schedule of Price, and all lands so purchased shall be the property of the Employer.

- The Contractor shall observe all the legal provisions and the provisions of the Special Specifications in respect of his activities at borrow pits and when finishing off the borrow pits. The Contractor shall satisfy himself that all necessary negotiations have been made with the Owner or Legal Occupants of the ground prior to entry.
- In case of material extraction, The Contractor will liaise with the district, municipalities and regional administration or the appropriate authority to pay all levies and royalties associated with building materials extraction. Noting that all levies and royalties' charges by these authorities are contractor's responsibilities.

8.2.2 Development of Gender Based Violence and Violence Against Children Management Plan

- **Gender and Equality** - The Contractor shall sensitively incorporate a gender perspective and provide equality where women and men have equal opportunities to participate in and benefit from planning and development of Works as stipulated in National Policy on gender development in Tanzania, 1992; Women and gender Policy, 2002; National economic empowerment policy, 2004; National employment policy, 1997, Community development policy, 1996; employment and labor relations Act, 2004 and National strategies for gender development, 2005.
- **GBV** - The Contractor shall have to identify, mitigate and prevent risk of sexual exploitation and abuse (SEA), and its effects as a key facet of gender-based violence (GBV) during construction works in referring to the Ministry of health and social welfare guidelines on GBV; women and gender development policy, 2002, National policy on women on development in Tanzania, 1992; national employment policy, 1997; Law of the child act, 2009; Rights of persons with disabilities act, 2010; education act, 1978; and Enforcement of basic rights and duties act, Cap 3.
- **Child Protection and Child labor** - The Contractor shall adhere to Law of Child Act, 2009; Child Protection Act, 2009; Children's act, 2011; Employment and Labor relations Act, 2004 and the National Employment policy, 1997 for provision of guidance on protecting a child during Works
- **People with disabilities** - The Contractor shall consider the vulnerable people with disabilities by providing all the rights and infrastructure on work site as stipulated in the National persons with disabilities act, 2010; Enforcement of basic rights and duties act; employment and labor relations act, 2004 as well as the Ministry of health and social welfare guidelines on vulnerable groups
- **Local community involvement**- The Contractor shall involve and work closely at all levels during the Works with the local community including the Works end

users and relevant local authorities as per Community development policy, 1996; the community service act; village act, 1999 and employment and labor relations act, 2004.

8.2.3 Development of Influx Management Plan

The Contractor shall identify the broader social risk to the rural communities caused by large influxes of local and foreign construction workers and put in place specific measures to mitigate the risks with high reference to the Environmental and Social Management Plan (ESMP) from the ESIA of the project; employment and labor relations act, 2004 as well as non-citizens employment regulations act, 2015.

However, the Contractor shall also be aware of International best practices on acknowledging the laws, regulations, guidelines, standards, policies and safeguards on ESHS such as World Bank EHS guidelines, IFC performance standards, Convention on the rights of the child (CRC), 1989; UN convention on the elimination of all forms of discrimination against women, 1979; ILO recommendation no. 200 on International labor standards on HIV and AIDS; WHO guidelines on safety and health; International labor standards on Occupational health and safety; Occupational health and safety management standards (ISO 45001); OHSAS 18001; Environmental Management systems standards (ISO 14001); ILO standards and guideline and World Bank social performance standards and guidance notes.

8.2.4 Development of an Environmental Health and Safety

The Contractor shall provide and maintain a healthy and safe work environment and a safe system of work protecting the workers, labors, users as well as the local communities as a compliance to the national Occupational and Health act (OSHA), 2003; Public Health act, 2004 and Employment and labor relations act, 2004 respectively.

- **HIV and AIDS**

The Contractor shall engage himself in minimize the risk of HIV and AIDS transmission and to mitigate its associated effects at individual and community levels with the execution of works as instructed in the National Aids policy, 2001 and HIV and AIDS (prevention and control) Act, 2008.

To ensure its employees' health and safety, the Uvinza to Kigadye SGR project plan will address the following topics:

- a). Safety device to protect employees from injuries or hazardous conditions;
- b). Safe drinking water;
- c). Immunizations, as applicable
- d). Clean eating area;
- e). First aid facilities;
- f). Sanitary conditions;
- g). Waste management, including bathrooms, and proper disposal procedures;
- h). Appropriate signage;
- i). Fire prevention facilities, training, and awareness; and
- j). Personal Protective Equipment (PPE).

A safety specialist assigned by the contractor for the Uvinza to Kigadye SGR project will be responsible for the preparation, implementation and maintenance of a comprehensive safety program, which will be periodically evaluated. The safety specialist will be provided with written safety instructions including instructions on correct storage handling and disposal of hazardous waste, and written contingency Plans / guidelines of action for accidents, spills, and fire. The responsibility of the safety specialist includes performing safety training and conducting safety inspections, sessions and practice. The safety specialist will also be responsible for the investigation of accidents. A safety committee should be formed by the contractor Uvinza to Kigadye SGR project and regular safety meetings should be organized.

8.2.5 Development of an Emergency Response Plan

An Emergency Preparedness and Response Plan (EPRP) will be prepared to assist project staff in effectively responding to emergencies associated with project hazards. The EPRP will comply with the IFC Occupational Safety guidelines and performance standards. The EPRP will include:

- a). Roles and responsibilities of emergency personnel;
- b). Emergency contacts and communications systems/protocols, including procedures for interaction with local and regional emergency authorities;
- c). Specific emergency response procedures;
- d). Design and implementation of an emergency alarm system audible across the entire site at the sub-stations;
- e). An evacuation plan will be read and practice by all employees and contractors. The evacuation plan will include emergency escape routes, procedures for

- accounting for employees after an evacuation, and roles and responsibilities of personnel during an evacuation;
- f). Identification of supplies and resources to be utilized during an emergency event, including emergency equipment, facilities, and designated areas; and
- g). A training plan, which includes specific training and drill schedules for personnel
- h). Who are responsible for rescue operations, medical duties, spill response, and fire response

If an emergency develops, all persons on site will be notified immediately and efforts will be coordinated with others in the vicinity surrounding the project area in order to reduce impacts, if applicable. The National Environmental Management Council, the Fire and Rescue Department, local police, and all necessary authorities will be immediately notified. If an emergency is imminent, but has not yet begun, steps will be initiated to immediately advise person in the vicinity of the emergency to evacuate and notifications will be made to NEMC, the Fire and Rescue Department, local police, and all other authorities which have responsibility regarding the emergency.

If there is a slowly developing emergency or unusual situation where an emergency is not imminent, but could occur if no action is taken, project personnel will notify the NEMC, local police, and all other authorities of the potential problem and keep them advised of the situation. These agencies will be requested to indicate if there are any immediate actions that should be taken to reduce the risk or severity of the emergency and if necessary, what preventative actions will be implemented. In an emergency situation, equipment and supplies will be needed on short notice. Therefore, the contractor will maintain an accurate inventory of emergency response equipment and supplies.

The EPRP will include an evacuation plan which will be read and practiced by all employees and contractors. The evacuation plan will include emergency escape routes, procedures, for accounting for employees after an evacuation, and roles and responsibilities of personnel during an evacuation. In general, the following evacuation procedures should be followed:

- a). Alert the Emergency Response Team to assist in the evacuation.
- b). Use communications tools that are appropriate for the type of incident and the time of occurrence, such as alarms or loud speakers.
- c). When communicating an evacuation, speak clearly and succinctly: “we have a [state the type of emergency]. Evacuate to [state the assembly point]”.
- d). Turn equipment off, if possible.
- e). Take emergency supplies and staff rosters, if possible.
- f). Account for personnel.

- g). Wait at the assembly point for further instructions

The ERPP will have specific information on the fire safety and explosion response, which will provide additional details specific to these emergencies

8.2.6 Development of a Waste Management Plan

The contractor for the Uvinza – Kigadye SGR project will develop a project specific waste management plan to ensure that all waste for the project activities are properly managed in accordance with applicable laws and regulations, and international standards relevant to the power distribution industry. The waste Management Plan will include:

- h). Description of the types of waste that will be generated
- i). Waste minimization opportunities
- j). Waste management methods
- k). Good housekeeping practices, including manifest and waste tracking forms

The following general categories of waste are anticipated to be generated from the project at this time:

- a). Hazardous waste such as construction wastes and debris from excavation materials, unused paint, lubricant, batteries, or similar chemicals that exhibit flammability, corrosive or reactive characteristic
- b). Liquid waste discharged such as sanitary wastewater and gray water, macerated food waste
- c). Solid wastes, such as packaging materials, containers, used PPE
- d). Special and recyclable waste, e.g. Batteries, used oil, paper aluminium cans, fluorescent light bulbs, mercury light bulbs
- e). Domestic waste, e.g. refuse

The plan will specify the proper storage, handling and disposal procedures for each waste identified.

During the construction phases, there will be generation of construction debris as a result of various construction activities. The generated materials will be used for reclamation purposes whenever applicable. Nevertheless, care will be taken to ensure the absence of contaminated fill material and the adequacy of the physical and chemical properties of

such material to limit potential adverse impacts on water and soil and ensure the safety of the project. Construction waste will also be minimized through careful planning during the design stage, whereby reducing or elimination overpowering of construction materials to decrease waste generation and reduce project costs (cost of surplus materials). Sorting of construction and demolition waste will be encouraged, as well as, adoption of a reuse/recycle program on site whenever deemed feasible.

Chemical waste generated includes containers that will be used for storage of chemical waste on site, the chemical residue as well as contaminated material. These materials will be segregated as hazardous and non-hazardous and properly stored and disposed of. Storage will be place in a separate area that has an impermeable floor, adequate ventilation and a roof to prevent rainfall from entering. In addition, all chemical waste must be clearly labelled in English and Kiswahili stored in corrosion resistant containers and arranged that incompatible materials are adequately separated. There will be a prior agreement with the NEMC for the disposal hazardous waste generated.

General refuse will be stored in enclosed bins or compaction units separate from construction and chemical waste. An agreement will be drafted with a solid waste collector certified by the NEMC to identify collection sites and schedule the removal to minimize odor, past infestation and litter build-up. The burning of refuse on the construction site will be strictly prohibited and penalized. General refuse is generated largely by food service activities on sites, so reusable rather than disposable dishware will be promoted id feasible. Aluminium cans will be recovered from the waste stream by their storage collectors if they are segregated and made easily accessible, so separate, labelled bins for their storage should be provided if feasible. Janitorial services will be assigned for upkeep of project sites during construction phase.

8.2.7 Development Spill Contingency Management Plan

The contractor for the Uvinza – Kigadye SGR project will prepare and implement a spill contingency management plan that identifies this procedure to prevent, contain, clean-up, and report spill and release of fuel oil and their hazardous materials. Mitigation measures to prevent contamination from hazardous materials are primarily aimed at preventing their release into the environment in the first place and will include:

- a). Keeping equipment maintained.
- b). Inspecting equipment and containers for spill and leaks, corrosion, or other signs of deterioration
- c). Maintaining spill response equipment near material storage areas and on heavy equipment.
- d). Training employees on material storage, transfer, and transportation procedures, spill response procedures, and reporting requirements.

If a fuel spill occurs at the project sites, prompt action will be taken to contain the leakage or spillage in the event of a spill of leak, all combustible, flammable, and ignition sources (such as running engines) likely to result in a fire will be removed from the vicinity of the spill and anyone in the area will be advised to stay upwind. Spill kits will be kept at the project sites and the transport vehicles to readily clean up small spills. Large spills will be contained by constructing a berm around the spill area to control runoff to surface water. All soil contaminated by previous spills will be excavated and disposed of in accordance with the contractor's hazardous waste management procedures.

8.2.8 Air Quality: Generation of Air Emissions from Disturbance

Control techniques for minimizing temporary particulate matter (PM) emission during Construction will involve watering of surfaces, chemical stabilization, or surface wind speed with windbreak or source enclosures. Furthermore, surface improvements offer long-term control techniques. These includes covering the road surface with a new material of lower site content, such as covering a dirt road with gravel or slag. Also, regular maintenance practices, such as grading of gravel roads, help to retain larger aggregate size on the travelled portion of the road and thus help reduce emissions. The amount of emissions reduction is tied directly to the reduction in surface site content.

8.2.9 Generation of Air Emission of Vehicles and Equipment Engines

In addition to PM generation, emissions will consist of combustion emission from diesel engine-driven electrical generators and vehicles and diesel-driven mobile construction equipment (such as, concrete trucks, dump trucks, excavators, and backhoes. The engines emit primarily CO₂, CO, NO₂, Sox, and HC. Measures to reduce combustion emissions include proper truck and engine maintenance, adoption of a traffic management plan while avoiding congested routes, proper maintenance of construction equipment, and the quality of diesel fuel used. In addition, equipment will be turned off when not in use, while would reduce power needs as well as emissions of pollutants. The supervising consultant will have the responsibility of ensuring the implementation of these measures by the contractor.

8.2.10 Degradation of Water Quality due to Storm Water Runoff

The removal of vegetation and disturbance of soil in the construction work areas may result in erosion and sedimentation causing increased turbidity in water within the project area. Additionally, degradation of water quality may occur from pollutants in storm water runoff from material and equipment storage areas and spills and leaks from construction equipment. Special care must be taken to decrease impacts where work is or near the marshland/wetland and mangrove areas so as to keep disturbance of the ecosystems to

a minimum. Prior to commencement of construction activities, TRC will require its contractors to prepare and implement an Erosion and sediment Control Plan. Its purpose will be to assist TRC, its contractor, and subcontractors in the implementation of control measure for storm waste runoff from the transmission line corridor, the substations, and material storage areas to prevent degradation of water quality. The plan will achieve this purpose by specifying the best management practices, required to assess the effectiveness of construction storm water management practices, especially during the rainy season. TRC will demonstrate, to the satisfaction line route will not occur during any stage of construction. Briefly, the erosion and sediment control measures to be implemented during the construction phase of the project include:

- a). Minimizing land cleaning activities to the tower location work areas, access points, and material storage area
- b). Minimizing the time of exposure of erodible land exposed to storm water runoff during the rainy season
- c). Maintaining a riparian management Zone (RMZ) (width 15m 174) between the construction work areas and surface water bodies to filter sediments in storm water runoff
- d). Covering open stockpiles of construction materials with tarpaulin or similar fabric during rainstorm events to prevent erosion and resultant sedimentation of receiving waters.
- e). Compacting soil as soon as the tower foundations are formed to prevent erosion, especially during the wet season
- f). Restoring the construction working areas as soon as possible once construction is complete at each tower location.

8.2.11 Degradation of Water Quality due to Accidental Spills and Leaks

TRC will require the contractor to develop and implement a spill contingency plan to prevent and mitigate spills of oils or hazardous material to surface water bodies and groundwater. Storage of fuel and hazardous material should not occur within 30m of a surface water body. If any pumps are needed for removal of water during tower construction within 30m of marshland/wetland water body. They will utilize proper secondary containment. Oil leakage or spillage will be contained and cleaned up immediately. Spent oil and lubricants will be collected and stored for recycling or proper disposal. In addition, all fuel tanks and chemical storage areas will be provided with locks and located within secondary containment structure. Oil/water separators will be installed at storm water channels to remove oils from contaminated waters such as from workshops.

8.2.12 Soil Contamination and Erosion due to erosion

Prior to commencement of construction activities, TRC/contractor will implement an erosion and sediment control Plan, TRC will demonstrate, to the satisfaction of NEMC that any substantial risk of increased sediment discharges from the project sites will not occur during any stage of the project. Cleaning of vegetation will be limited to where it is strictly needed so as to decrease the risk of soil erosion, and Riparian Management Zone (RMZ) (width 15m) between the construction areas and surface water bodies. Unpaved roads will be graded so that to decrease the risk of erosion during rainstorms.

- a). Soils excavated for tower foundations will be used for re-filling and will not be left exposed to wind or water for long periods
- b). The contractor will avoid steep terrain during the transportation material by using alternative route or use light vehicles where appropriate.
- c). Heavy machinery will be used as needed in the clearance of construction work areas in order to minimize soil compaction, which makes the soil susceptible for erosion
- d). Riverine and surface water body associated vegetation will be minimally disturbed during the construction phase to reduce soil erosion and safeguard bank protection
- e). Disturbed areas will be replanted with local species common in the area complement natural vegetation regeneration to improve cover
- f). In areas prone to soil erosion, suitable sediment binding grasses will be planted in degraded substrates.

8.2.13 Noise Management

Typical mitigation measures that will be enforced during construction to minimize noise Levels are:

- a). Effectively utilizing material stockpiles and other structures, where feasible; to reduce noise from on-site construction activities
- b). Choosing inherently quiet equipment
- c). Operating only well-maintained mechanical equipment on-site
- d). Keeping equipment speed as low as possible shutting down or throttling down to minimum equipment that may be intermittent in use, between work periods
- e). Utilizing and properly maintaining silencer or mufflers that reduce vibration on construction equipment during construction works
- f). Restricting access to the site for truck traffic outside of normal working hours
- g). Utilizing proper site logistics and planning

- h). Limiting site working hours the morning hour
- i). Scheduling noisy activities strictly during the morning hours
- j). Consulting with local communities and informing the locals when noisy activities are planned
- k). Enforcing noise monitoring
- l). Enforce the use of hearing protection actively when the equivalent sound level over 8 hours reaches 85 dB(A), the peak sound levels reach 140dB(C), or the average maximum sound level reaches 110db(A)
- m). Installing warning signs in area high noise levels
- n). Consider the use of acoustic insulating materials, isolation of the noise source, and other engineering controls to minimize noise impact.

The noise control measure will be included within the construction contracts and be considered as requirements from contractors. The supervising consultant will have the responsibility of ensuring the implementation of these measures.

8.2.14 Biological Resources & Habitat Alterations

The clearing of vegetation in the construction work areas may have a significant impact on terrestrial habitats especially in areas with tree cover. During the process of embankment preparation, there is need to take into consideration the importance of critical habitat including forest patches and wetlands for biodiversity that depend on roadside habitats. Recommended mitigation measures include:

- a). Ensure minimum footprint along the alignment by confining construction work within the acquired project areas
- b). Avoid identified sites that appear to be important wildlife crossings with high diversity of plant and animal species
- c). Enforce laws governing protection of rare endemic and endangered species
- d). Ensure habitat restoration throughout the project footprint,
- e). Prepare and implement a Biodiversity Action Plan (BAP)
- f). Implement stratification approach on extraction of materials starting with less habited section
- g). Prepare wetlands restoration and rehabilitation plan
- h). Undertake frequent monitoring to ensure resumed functioning of the wetland ecosystems along the alignment
- i). Prepare and implement an invasive species eradication plan in all areas impacted within the Project area
- j). Screen sources of construction materials by identifying all organisms on identified sources
- k). Identify section affected by invasive species

- l). Prepare invasive species eradication plan in collaboration with experts
- m). Dispose spoil material to designated site
- n). Mechanical removal invasive species in all areas encountered
- o). Valuable timber removed from woody biomass be made available for public consumption
- p). Collaborate with TFS to establish afforestation program around the project using local indigenous species
- q). Designate forested area for conservation to compensate the anticipated loss (offsetting the impact)
- r). Contractor to opt for viaduct or super-bridge flyover of an average of 18 m in area identified to as crossing
- s). Prepare and implement livelihood restoration plans based on forest conservation that benefit communities

8.2.15 Hazardous Materials Management

TRC will require its contractor to prepare and implement a spill contingency Plan that identifies the procedures to prevent, contain, clean-up, and report spills and releases of oil and hazardous material Mitigation measures to prevent contamination from hazardous materials are primarily aimed at preventing their release into the environment in the first place and will include:

- a). Storing oil and hazardous materials within secondary containment structures in designated area
- b). Using portable oil collection pans during refuelling operations
- c). Storing pesticides and herbicides in designated areas according to FAO Guideline standards any pesticides to be used will be manufactured, packaged, labelled, handled, stored, disposed of, and applied according to standards such as the minimum standards of FAO's Guidelines for packaging and storage of pesticides (Rome, 1985), Guidelines on Good labelling practice for pesticides (Rome, 1995)
- d). Ensuring that no storage of oil and hazardous materials occurs within 30m of a surface waste body Keeping equipment maintained
- e). Inspecting equipment and containers for spill and leaks, corrosion, or other signs of deterioration
- f). Maintaining spill response equipment near material storage areas and on heavy equipment
- g). Ensuring all working dealing with such substances are adequately informed about the risks
- h). Training employees on material storage, transfer, and transportation procedures, spill response procedures, and reporting requirements

- i). TRC/contractor will keep an accurate inventory of all oil, hazardous material, and waste stored on site and material safety Data sheets will be available for these material

If a fuel/oil spill occurs at the project site, on any of the access roads to the site, or into a Water body or wetland, prompt action will be taken to contain the leakage of spillage. In the event of a spill or leak, all combustibles, flammables, and ignition sources (such as running engines) likely to result in a fire will be removed from the vicinity of the spill and anyone in the area will be advised to stay upwind. Spill kits will be kept at the project site and on the transport vehicles to readily clean up small spills. Large spills will be contained by constructing a berm around the spill area to control runoff surface water, or deploying a spill boom if the spill is in a water body. All soil contaminated by the spills will be excavated and disposed of in accordance with the NEMC hazardous waste management procedures.

8.2.16 Develop and implement a Biodiversity Action Plan (BAP)

The contractor will be required to develop and implement a Biodiversity Action Plan in accordance with the OS 3 of AfDB 2015 and PS 6 of the IFC 2012 detailing commitment in the Implementation Plan of the SGR Uvinza-Kigadye by September 2023. The BAP must demonstrate the contractor's commitment to fulfilling its duty under the Natural EMA 2004, and as stipulated in PS 6 of the IFC 2012 on environmental and biodiversity protection.

Many of the contractor's activities have negative effects on biodiversity. It is hoped that this Biodiversity Action Plan will help the contractors to minimize negative effects on biodiversity and maximise the biodiversity benefits from its activities and demonstrate its contribution to the Governments of Tanzania Biodiversity Action Plan targets. The Biodiversity Action Plan will be adopted as one of its policies and is committed to its implementation. It will review the plan periodically and update it as appropriate.

8.2.17 Develop and implement wetlands restoration and rehabilitation plan

The contractor will be required to develop a Wetlands Action Plan (WAP) to guide for the planning and implementation of projects and activities essential to the understanding, conservation, protection, restoration and management of wetlands in a project planning area.

Wetlands Action Plans focusing on:

- a). Identifying all wetland resources within a given planning area;

- b). Describing natural conditions that affect the resource;
- c). Identifying anthropogenic stressors that affect wetlands in the planning area;
- d). Establishing wetlands baseline conditions and locating reference sites;
- e). Identifying data gaps;
- f). Prioritizing sites with potential for restoration and protection;
- g). Developing of measures to reduce chronic and cumulative impacts to wetlands;
- h). Strategizing financing options;
- i). Identifying strategies and outreach to engage stakeholders and the community;
- j). Monitoring to measure success of implemented projects and to adaptively manage others;
- k). Clarifying goals and recommendations for future wetland protection, restoration, and management with an emphasis on restoring and preserving ecological condition, wetland functions, and preserving wildlife, wildlife corridors, refugia and habitat.

A Wetlands Action Plan emphasizes protection and restoration of wetlands for the ecological functions and societal benefits that wetlands provide. The Action Plan will be adopted as one of its policies and the contractor is committed to its implementation. It will review the plan periodically and update it as appropriate.

8.2.18 Develop and implement an invasive species management/eradication plan (ISMP)

The contractor will be required to develop ISMP to preserve and enhance the functions and values of the wetlands and uplands within the project area. While complete eradication of invasive species is not a stated or realistic goal, this ISMP is designed to limit the spread of identified species to the maximum extent practicable. The ISMP includes the following objectives:

- a). Identify locations within the project area in which invasive species presently exist in order to develop a baseline for future monitoring;
- b). Provide a plan for monitoring the status of invasive species within the project area and report the results of the monitoring to involved natural resource agencies;
- c). Outline the anticipated schedule and duration of monitoring; and
- d). Identify appropriate strategies for controlling and/or limiting the spread of invasive plant species within the project area (e.g., mechanical cutting, herbicide application, biological control, or a combination thereof)

The Action Plan will be adopted as one of its policies and the contractor is committed to its implementation. It will review the plan periodically and update it as appropriate.

8.2.19 Develop and implement livelihood restoration plans based on forest conservation that benefit communities

The contractor will be required to develop Livelihood Restoration Plan means the plan for the restoration of livelihoods of persons adversely affected by the Project, prepared in connection with the proposed Project, as approved by the Bank. The Action Plan will be adopted as one of its policies and the contractor is committed to its implementation. It will review the plan periodically and update it as appropriate.

CHAPTER NINE

9 ENVIRONMENTAL AND SOCIAL MONITORING PLAN

Tanzania has been facing with problem in coordinating and implementation environmental and social monitoring plan. The EMA (URT, 2004) and the EIA Regulations (URT, 2005) defines measures that must be taken to address this issue. Monitoring must include checking for effectiveness or otherwise of mitigation and enhancement measures.

EMA No. Cap 191 of 2004 defines roles for monitoring where the National Environment Management Council (NEMC) is empowered to enforce compliance to the national environment regulation including provision environmental permits prior to development and follow in monitoring to ensure implementation of the Environmental Management Plans (EMP). NEMC is therefore required to conduct monitoring activities in collaboration with relevant sectors and other stakeholders.

Monitoring refers to the systematic collection of data through a series of repetitive measurements over a long period-of time to provide information on characteristics and functioning of environmental and social variables in specific areas over time. The proposed Environmental and Social monitoring plan for the construction of Uvinza – Kigadye railway is summarized in Table 25.

The table indicates the predicted impact, proposed mitigation measures time frame to implement any intervention, it also shows the responsible institution for implementing the plan, the opportune time for undertaking each mitigation/enhancement measure and cost estimate for implementing the mitigation/enhancement measures. Furthermore, it indicates the frequency of monitoring, reporting, and monitoring indicators to follow or measure to check the compliance with the acceptable limit of acceptable use or change. It is anticipated that the developer will set aside these funds to implement the monitoring plan developed.

Table 9-1: Environmental and Social Monitoring Plan for Uvinza - Kigadye Railway Project

A) Socio-economic environment

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
Positive Impacts							
1	Increased employment opportunities	<ul style="list-style-type: none"> • Prioritize employment to local communities taking into account relevant skills and gender • Provide on job training to workers • Support local technical training institutions to build capacity 	TRC Contractor	<p>Number and gender of local people employed</p> <p>Presence/absence of worker's training programmes</p> <p>Number of workers trained based on skills</p> <p>Type of support provided</p>	Biannual during mobilization, construction and operation	Reports and surveys	60,000
2	Increased government revenue generation	<ul style="list-style-type: none"> • Ensure allocation of sufficient financial resources for implementation of the project (e.g. through PPP, Bank loans, own funds) 	TRC,	Presence/absence of funds for the project	Quarterly during mobilization and construction	Survey, reports and field inspection	50,000

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		Ensure timely implementation of the project		Presence of functional schedule work			
		<ul style="list-style-type: none"> Improve tax collection mechanisms within the railway catchment 		Trend of revenue due to government	Quarterly during mobilization, construction and operation		
		<ul style="list-style-type: none"> Improve security of the railway facilities 		Presence/absence of functional security system Numbers of complaints	Quarterly during operation		

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
3	Improvement of local economy	<ul style="list-style-type: none"> Promote economic linkages with railway line Provide incentives to various productive sectors and entrepreneurs such as loans for investments Promote small scale food processing industries for value addition Promote availability of markets for goods 	TRC	Presence/absence of empowerment programs Trends in growth of local economy	Annually during mobilization, construction and operation	Surveys and Reports	70,000
		<ul style="list-style-type: none"> Set affordable railway transportation costs 		Trends in cost of transportation Number and types of complain from customer	Annually during operation		

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
4	Enhanced Regional Trade	<ul style="list-style-type: none">Ensure timely implementation of the project to high standardsEnsure allocation of sufficient financial resources for implementation of the project	, TRC,	Presence of functional schedule of work	Annually during mobilization and construction	Reports	20,000
		Presence/absence of funds for the project					
		<ul style="list-style-type: none">Effective implementation of the trade protocols		Type and number of protocols implemented	Annually during operation		
		<ul style="list-style-type: none">Establish effective institution arrangement to manage the railway		Presence /absence of functional institutional arrangement			
5	Improved transportation system	<ul style="list-style-type: none">Promote industrial development in the railway catchment areaPromote economic linkage with railway line	TRC	Presence/absence of empowerment programs	Annually during mobilization, construction and operation	Surveys and Reports	50,000
			Trends in growth of local economy				

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		<ul style="list-style-type: none"> Ensure allocation of sufficient financial resources for implementation of the project (e.g. through PPP, Bank Loans, own funds) 		Presence/absence of funds for the project			
		<ul style="list-style-type: none"> Improve security at the port and on-transit 		Presence/absence of functional security system Numbers of complaints	Quarterly during operation		
		<ul style="list-style-type: none"> Ensure regular maintenance of the railway line 		Presence/absence of functional railway maintenance programs/schedule			
		<ul style="list-style-type: none"> Establish effective institution arrangement to manage the railway 		Presence /absence of functional institutional arrangement	Annually during operation		
Negative Impacts							
1	Loss of land and other properties	<ul style="list-style-type: none"> Provide detailed information to affected persons about their rights/ options pertaining 	TRC Contractor	Number of meetings and types of information disseminated	In tandem with mobilization and	Survey and reports	850,000

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		<p>to land acquisition</p> <ul style="list-style-type: none"> • Provide fair, prompt and effective compensation at full replacement cost • Acquire only land necessary for the proposed project (including access roads) • Confine construction and operation activities within designated wayleave 		<p>Number of affected persons compensated at full replacement cost</p> <p>Presence/absence of functional grievance redress mechanism</p> <p>Number and type of complains</p> <p>Incidences and extent of project activities outside the core designated area</p>	construction		
2	Increased Level of crime and insecurity	<ul style="list-style-type: none"> • Sensitize workers and surrounding communities to protect railway. • Provide escort and security for the project goods and facilities. • Involve the local community in the maintenance and management of new infrastructures 	TRC Contractor	<p>Presence/absence of sensitization programs</p> <p>Presence /absence of security systems</p> <p>Number of reported incidences of crimes and insecurity</p>	Quarterly during mobilization, construction and operation	Survey and reports	50,000

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
				Number and types of local people involved			
3	Change in Demographic characteristics	<ul style="list-style-type: none"> • Use local labour taking into account relevant skills and gender • Provide reproductive health education 	TRC Contractor	<p>Number and gender of local people employed</p> <p>Presence /absence of functional reproductive health programmes</p>	Annually during mobilization, construction and operation	Survey and reports	40,000
4	Accidents, risks and hazards	<ul style="list-style-type: none"> • Provide training on relevant safety measures, first aid procedures and emergency response to workers. • Provide full package of first aid kit at work places and workers' camps • Provide and enforce use of PPEs • Put warnings signs in dangerous corners, animal crossings and other risk areas 	TRC Contractor	<p>Presence /absence of training programmes</p> <p>Number of certified trained staff on safety measures</p> <p>Presence /absence of full packaged and functioning first Aid Kits</p>	Quarterly during mobilization, construction and operation	Field inspection, measurements and reports	30,000

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		<ul style="list-style-type: none"> • Use approved chemical substances for cleaning trains • Regular maintenance of train engines to minimize oil leakage • Provide oil skimmers at all designated maintenance bays and dispose through registered oil collectors • Discharged waste water to meet Tanzania and Burundi waste water standards 		<p>Presence/absence of appropriate functional PPEs</p> <p>Presence/absence of Company enforcement policy</p> <p>Presence/absence of warnings signs</p> <p>Presence/absence and use of approved chemicals</p> <p>Incidence of water/soil pollution/contamination</p> <p>Presence/absence of functional oil traps and skimmers</p> <p>Presence /absence of schedule of maintenance</p> <p>Level of pollution as per TZS 860:2006</p>			

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
5	Increased land use conflicts	<ul style="list-style-type: none"> • Effect prompt and fair compensation for the lost land at full replacement cost • Raise awareness to the local communities on land ownership and compensation issues • Establish proper grievance redress mechanisms • Prepare and enforce land use plans 	TRC Contractor	<p>Number of affected persons compensated at full replacement cost</p> <p>Number and types of complaints from affected persons</p> <p>Number and types of awareness programmes</p> <p>Presence/absence of functional grievance redress mechanisms</p> <p>Presence/absence of land use plans</p>	Quarterly during mobilization and construction	Reports and survey	Covered under loss of Land and properties
6	Change in land values	<ul style="list-style-type: none"> • Acquire only land that is needed for the project development. 	TRC	Extent of deviation from the core project area	Annually during mobilization and construction	Field inspection and reports	Covered in loss of land and properties

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		<ul style="list-style-type: none"> Develop and enforce policies that will prevent land speculation Develop and enforce measures to control land prices 		<p>Trends in land value</p> <p>Presence /absence of functional policy to control land price</p>	Annually during mobilization, construction and operation	Surveys and Reports	
		<ul style="list-style-type: none"> Raise awareness to local people not to sale land haphazardly 		<p>Presence/absence of awareness facilitation programmes</p>			
7	Noise pollution	<ul style="list-style-type: none"> Provide construction workers with appropriate earplugs or earmuffs and enforce their use Ensure regular servicing of construction equipment and maintenance of train and railway line Confine activities to core project area Install noise barriers in sensitive/ populated areas 	TRC Contractor	<p>Presence/absence of appropriate PPE</p> <p>Number of workers using approved PPE</p> <p>Presence/absence of comprehensive and functional maintenance schedule</p> <p>Extent of deviation of construction activities from the core area</p> <p>Presence/absence</p>	<p>Quarterly during construction</p> <p>Quarterly during construction and operation</p>	Field Inspection , survey, measurements and reports	60,000

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
				of functional noise barriers Noise level as per TZS			
8	Increased rate of HIV/STDs	<ul style="list-style-type: none"> • Provide awareness on HIV/AIDS and other communicable diseases. • Provide Voluntary Counselling and Testing (VCT) centres for HIV/AIDs at work place, • Enforce HIV/AIDS law and regulations that prohibit stigma and discrimination 	TRC Contractor	Number of functional awareness programmes Presence /absence of functional VCT centres Trend in HIV/AIDS prevalence Compliance to HIV /AIDS laws and regulations	Quarterly during mobilization, construction and operation	Field inspection , survey and report	60,000
9	Pressure on local social services	<ul style="list-style-type: none"> • Support the cost of existing local social services where necessary • Support development of new social services where necessary 	TRC Contractor	Number, types of social services supported Funds allocated for the support Complaints from local communities on status of social services	Semi-annually during mobilization, construction and operation	Field inspection , Survey and reports	TBD

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
10	Pressure on water resources	<ul style="list-style-type: none"> Develop alternative sources of water Share water sources with local communities 	TRC Contractor	Number and types of alternative sources of water developed Presence/absence of water sharing mechanism Complaints from local communities on status of water supply	Semi-annually during mobilization, construction and operation	Field inspection, survey and reports	TBD
		<ul style="list-style-type: none"> Raise awareness on usage of water sparingly 		Presence/absence of awareness raising programs			
		<ul style="list-style-type: none"> Support local catchment conservation measures 		Funds allocated for the support			
11	Effect on Occupational health and safety	<ul style="list-style-type: none"> Provide adequate health care facilities (including first aid facilities) within construction sites; Ensure that all construction workers will be trained in basic sanitation, general health and safety matters, and on the specific hazards of 		-Number of reported cases of occupation injuries and illness Number of accidents reported Number benefiting from WCF	Quarterly	Throughout the project area	50,000

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		<p>their work;</p> <ul style="list-style-type: none"> • Provide Personal Protection Equipment (PPE) for workers, such as safety boots, helmets, gloves, protective clothing, goggles, and ear protection required in accordance with HSE legislation will be provided and used; • Provide training/briefing about safety – prior to commencement of works in rules for the handling and storage of hazardous substances (fuel, oil, lubricants, bitumen, paint) and cleaning of machinery/equipment will be provided; • Ensure International HSE standards are implemented in all contracts. • Ensure proper maintenance of vehicles and machinery prior to 					

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		use to ensure it is in safe condition					
12	Impacts on community health, safety and security	<ul style="list-style-type: none"> • Ensure that prior to all activities, the Project shall assess the risks of the works to local people including people walking by, people using nearby roads.. • Ensure that all hazardous materials and equipment must be contained and access to them by local people must be prevented. • Put barriers and warning signs around open excavations to prevent people falling into them • Put barriers and appropriate signage to prevent access to other hazardous areas, including areas in which equipment and vehicles are operating. • Where appropriate, flag 	TRC Contractor	<p>-Number of reported cases of illness related to construction</p> <p>Number of accidents reported</p>	Quarterly	Throughout the project area	50,000

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		<p>persons shall be used to minimise risk to community members in areas of activity and where vehicles enter / exit the Project site.</p> <ul style="list-style-type: none"> • Undertake visual inspections to confirm that nobody has entered the site and is in a hazardous location, e.g. people sleeping under equipment. • Store project materials and equipment securely stored to reduce the risk of theft or use as play areas for children 					
13	Impact on Gender Based Violence and Harassment (GBVH)	<ul style="list-style-type: none"> • TRC should develop anti GBV and anti-sexual harassment policies • The contractor should appoint senior focal points with responsibility for ensuring that commitments and policies to prevent GBVH and sexual harassment policies are implemented. 	TRC Contractor	<p>Reported GBV cases</p> <p>Presence/ absence of GBV policy</p> <p>Number and types of awareness programmes</p>	Quarterly	Throughout the project area	50,000

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		<ul style="list-style-type: none"> • The contractor should put in place monitoring systems at the highest levels for regular reporting on GBVH • Include requirements around GBVH in codes of conduct, policies and protocols for contractors, including training on policies and procedures once developed. • Ensure codes of conduct are publicly disclosed in local languages and are widely accessible to all workers and all groups of people in project areas. • TRC should ensure Resettlement Action Plan (RAPs) take into account gender dynamics including GBVH risks at household and community level • The contractor should deliver periodic mandatory training on GBVH to all workers, 					

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		<p>including contractors, subcontractors and core suppliers, as well as relevant consultants and clients.</p> <ul style="list-style-type: none"> The contractor should engage expertise (e.g. from local women's rights organisations or NGOs working on GBVH) to conduct awareness campaigns to provide information to local communities, such as what is unacceptable behaviour and how to report an incident of GBVH The contractor should develop Child rights protocols 					
14	Increasing pressure and encroachment of grazing and pasture land	<ul style="list-style-type: none"> Raise awareness about possibility of pasture and stock routes encroachment Facilitate land use plans in areas commonly used 	TRC Contractor				

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		by livestock keepers <ul style="list-style-type: none"> Facilitate preparation of village's by-laws to protect grazing areas. 					
15	Grazing land fragmentation and disturbance	<ul style="list-style-type: none"> In consultation with village leaders design and construct sufficient crossing/underpasses along the proposed SGR line. Ensure that full information is disclosed about project activities and potential impacts on people's rights and livelihood in a culturally appropriate way. Provide fair compensation to affected grazing land 	TRC Contractor	Presence of livestock crossing in relation to livestock keepers settlement and grazing area/water points	Quarterly	Whole project area	50,000
16	Destruction and contamination of livestock water points	<ul style="list-style-type: none"> Avoid destruction of livestock water points Identify livestock water points located close to project alignment and develop management and restoration plan. Restrict dispose spoil 	Contractor TRC	-Quality of water in boreholes, traditional, water wells	Monthly	Mobilization and construction	

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		material near water points					
17	Restricting access to stock routes and resources	<ul style="list-style-type: none"> Construct appropriate livestock crossing/underpasses along the proposed SGR line after full consultation with the local community leaders. Ensure that full information is disclosed about project activities and potential impacts on people's rights and livelihood in a culturally appropriate way 	TRC Contractor	Provisions to allow access to people and animals in place and functioning -Number of livestock crossing provided	Quarterly	Throughout project area	50,000
18	Impaired local air quality	<ul style="list-style-type: none"> Establish green belt using indigenous plant to act as greenhouse sink Use appropriate PPE (respiratory masks) Springling dusty construction sites with water. Cover and contain construction materials in trucks and storage place 	TRC Contractor	Hectors of green belt Presence/absence of appropriate PPE Number of workers using approved PPE Complains from workers and surrounding	Semi-annually during operation	Field inspection, Survey, measurements and reports	60,000

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
				communities on dust levels	Quarterly during construction and operation		
		<ul style="list-style-type: none">• Confine project activities to core construction areas		Extent of deviation from the core project area			
		<ul style="list-style-type: none">• Ensure regular maintenance of train engines		Presence /absence of schedule of maintenance			
		<ul style="list-style-type: none">• Adhere to Tanzania air quality standards		Level of air quality emissions as per TZS 860:2006			
	Impacts on Cultural Heritage						
34	Loss of Iron Age potsherds and Later Stone Age artifacts from archaeological sites	<ul style="list-style-type: none">• Conduct shovel test pits in workers camp and access roads sites• Conduct test excavations in the project area	TRC Contractor	Number of shovel test pits and finds Number of excavation pits and finds	Once during mobilization	Inspection and reports	40,000
35	Destruction	<ul style="list-style-type: none">• Conduct detailed	TRC	Number of	Once during	Field	Covered

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
	of Iron Age pottery sites and LSA tool sites	archaeological assessment to retrieve and preserve more archaeological heritage	Contractor	excavation units and finds	mobilization	Inspection and reports	under loss of iron age potsherds
36	Destruction of potential CSITR heritage	<ul style="list-style-type: none"> Avoid erecting workers camp in the corridor of the CSITR heritage. Conduct detailed archaeological assessment in the corridor of the CSITR heritage at Kibaoni 	TRC Contractor	Presence/absence of workers camp Number of excavation units and finds	Once during mobilization	Field Inspection and reports	Covered under loss of iron age potsherds
37	Destruction of potential Salt Caravan Route (SCR) heritage	<ul style="list-style-type: none"> Conduct shovel test pits in the areas where the railway line will cross/pass SCR. 	TRC Contractor	Number of shovel test pits and finds	Once during mobilization	Field Inspection and reports	20,000
38	Degradation of potential archaeological and cultural heritage sites	<ul style="list-style-type: none"> Raise awareness of contractors on identification and preservation of cultural heritage 	TRC Contractor,	Presence/absence of functional awareness programs	Once during mobilization and construction	Field Inspection and reports	25,000
		<ul style="list-style-type: none"> Conduct shovel test pits in project area 		Number of shovel test pits and finds	Once during mobilization		

No	Identified Impact	Enhancement/Mitigation Measures	Responsible Institution	Monitoring Indicators	Monitoring frequency	Means of verification	Relative estimated cost (USD)
		<ul style="list-style-type: none"> Implement Chance Finds Procedure 		Number of chance finds procedure undertaken and finds	Once during mobilization and construction		
39	Change in intangible heritage	<ul style="list-style-type: none"> Sensitize people to keep and respect their intangible heritage values Promote local intangible heritage values 	TRC Contractor	Presence /absence of a functional sensitization programs Presence/absence of functional promotion programs	Biannually during mobilization, construction and operation	Survey and reports	40,000

B) Biophysical environment

1	Vibration	<ul style="list-style-type: none"> • Ensure infrastructure designs include wide sleepers in combination with soft under sleeper pads and rail fastening systems with soft under rail pads. • Use high-quality, continuous smooth tracks. • Use purpose-built resilient fastenings to attach the new tracks directly to the structure • Use rubber insulators under the track to dampen vibrations. 	TRC Contactor	Presence /absence of implemented design reflecting proposed mitigation measures	In tandem with construction	Inspection, Survey, and reports	20,000
		<ul style="list-style-type: none"> • Inform affected community stakeholders regarding potential vibration impacts prior to start of works • Restrict infrastructure development inside the railway way leave 		Incidences of reported damage on surrounding infrastructures Number and size of cracks developed. Number of complaints from communities	Biannual during construction and operation		
			TRC Contractor	Presence /absence of minutes of meetings Presence/absence of illegal infrastructures within Way Leave	Annually during operation		

2	Change in surface runoff	<ul style="list-style-type: none"> • Confine removal of natural vegetation in designated areas • Ensure re-vegetation of affected areas after construction using indigenous plant species 	TRC contractor	<p>Presence /absence of removal of vegetation outside designated areas</p> <p>Extent of re-vegetated areas along the corridor</p>	Biannually during construction	Field inspection and reports	Covered under soil erosion and siltation
3	Management of overburden	<ul style="list-style-type: none"> • Stored soil overburden be bounded and wetted. • Use overburden soil to rehabilitate designated exhausted borrow pits and quarry sites. 	TRC/ contractor	<p>Presence/absence of bounded and wetted overburden</p> <p>Presence/absence of rehabilitated borrow pits/quarry site using overburden.</p> <p>Presence /absence of Stockpile of overburden soil</p>	Biannually during mobilization, and construction	Field Inspection and reports	20,000
4	Change in rivers and streams morphology	<ul style="list-style-type: none"> • Ensure that design of bridges and culverts is based on detailed studies and understanding of catchment characteristics and dynamics. • Install and maintain functional sediment control structures. 	TRC/ Contractor	Presence /absence of implemented design reflecting proposed mitigation measures	In tandem with construction	Inspection and Reports	40,000

		<ul style="list-style-type: none"> Re-vegetate cleared railway corridor areas using indigenous species 		Presence/absence of functional sediment control structures Extent of re-vegetated areas using indigenous species along the corridor	Once end of wet season during construction and operation Biannually during construction		
5	Disruption of wildlife movements	<ul style="list-style-type: none"> Install signage to warn drivers to reduce speed and maintain extra alertness when approaching potential wildlife corridors/crossings Minimize the size of construction gangs and noise within potential wildlife crossing sites 	TRC Contractor	Presence /absence of signage Incidence of animal kills and injuries Number and size of construction gangs within wildlife crossing sites	Biannually during construction Annually during construction	Filed inspection and report	15,000
6	Loss of wildlife	<ul style="list-style-type: none"> Install signage to warn drivers to reduce speed and maintain extra alertness when approaching potential wildlife corridors/crossing 	TRC/ contractor	Presence /absence of signage Incidence of animal kills and injuries	In tandem with construction and operation	Field inspection and Reports	Covered under disruption of wildlife movement

		<ul style="list-style-type: none"> Facilitate anti-poaching efforts 		<p>Reported incidences' of poaching</p> <p>Funds allocated to support anti-poaching</p>			
7	Surface water pollution	<ul style="list-style-type: none"> Use approved chemical substances for cleaning trains Provide oil traps to oil depot stations, and bridge crossing rivers Ensure regular maintenance of train engines to minimize oil leakage Provide oil skimmers at all designated maintenance bays and dispose through registered oil collectors Discharged waste water to meet Tanzania waste water standards 	TRC Contractor	<p>Presence/absence and use of approved chemicals</p> <p>Incidence of water/soil pollution/contamination</p> <p>Presence/absence of functional oil traps and skimmers</p> <p>Presence /absence of schedule of maintenance</p> <p>Level of pollution as per TZS 860:2006</p>	Biannually during operation	Field inspection, measurements and reports	100,000

8	Ground water pollution	<ul style="list-style-type: none"> • Use approved chemical substances for cleaning trains • Provide oil traps to oil depot stations, and bridges crossing rivers • Regular maintenance of train engines to minimize oil leakage • Provide oil skimmers at all designated maintenance bays and dispose through registered oil collectors • Discharged waste water to meet Tanzania standards • Regularly empty sanitary facilities and disposing the products in authorized sites 	TRC Contractor	<p>Presence/absence and use of approved chemicals</p> <p>Incidence of water/soil pollution/contamination</p> <p>Presence/absence of functional oil traps and skimmers</p> <p>Presence/absence of schedule of maintenance</p> <p>Level of pollution as per TZS 860:2006</p>	Biannually during operation	Field observation, measurements and reports	Covered under surface water pollution
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9	Soil pollution	<ul style="list-style-type: none"> • Use approved chemical substances for cleaning trains • Provide oil traps to oil depot stations, and bridge crossing rivers • Ensure regular maintenance of train engines to minimize oil leakage • Provide oil skimmers at all designated maintenance bays and dispose through registered oil collectors • Discharged waste water to meet Tanzania waste water standards 	TRC Contractor	<p>Presence/absence and use of approved chemicals</p> <p>Incidence of water/soil pollution/contamination</p> <p>Presence/absence of functional oil traps and skimmers</p> <p>Presence /absence of schedule of maintenance</p> <p>Level of pollution as per TZS 860:2006</p>	Biannually during operation	Field observation, measurements and reports	Covered under surface water pollution
10	Soil erosion and siltation	<ul style="list-style-type: none"> • Stabilize the slope edge according to contours and re-vegetation using indigenous plants species 	TRC Contractor	<p>Extent of vegetated slopes and type of plant species used</p> <p>Extent of erosion and siltation</p>	In tandem with	Field Inspection and report	40,000

		<ul style="list-style-type: none"> • Adopt engineering design that break the power of flowing water • Use pitched stones and wire mesh to control soil erosion on vertical edges • Cut and fill slopes shall be kept at <45° to minimize landslides 		Presence /absence of implemented design reflecting proposed mitigation measures Extent of use of pitched slope and wire mesh Extent of erosion and landslide	constructi on and operation		
		<ul style="list-style-type: none"> • Stored soil overburden be bounded and wetted • Install and maintain functional sediment control structures 		Presence/absence of bounded and wetted overburden Presence/absence of functional sediment control structures			
11	Solid waste generation	<ul style="list-style-type: none"> • Sort and dispose solid waste at designated sites 	TRC Contractor	Presence/absence and types of solid waste within the wayleave Presence /absence of coded solid waste collection bins Presence/absence of functional disposal facility	Quarterly during mobilization, construction and operation	Field inspection, survey and reports	30,000

		<ul style="list-style-type: none"> • Reduce, recover, reuse and recycle solid waste 		Presence/absence of recycling facilities			
		<ul style="list-style-type: none"> • Raise awareness to workers/staff/passengers on environmental and safety issues 		Presence/absence of functional program to reduce and recover solid wastes			
		<ul style="list-style-type: none"> • Use overburden soil to rehabilitate exhausted borrow pits and quarry sites within the corridor 		Presence/absence of functional awareness programme			
12	Liquid waste generation	<ul style="list-style-type: none"> • Use mobile toilets or soak away/septic tanks treatment systems in construction sites and worker's camps respectively 	TRC Contractor	Presence/absence of functional mobile toilets, soak away/septic tanks	Monthly during construction	Field inspection and reports	30,000

		<ul style="list-style-type: none"> Establish and use soak away/septic tanks treatment systems at stations Provide oil skimmers at all designated maintenance bays and dispose through registered oil collectors Treat and discharge waste water to meet Tanzania and Burundi water quality standards Raise awareness to workers/staff/passengers on environmental and safety issues Connect to available urban liquid waste system in cities and towns 		<p>systems</p> <p>Presence/absence of functional oil traps and skimmers</p> <p>Presence/absence of MoU between TRC and registered oil collectors</p> <p>Presence/absence of functional liquid waste treatment plant</p> <p>Effluent waste water as per TZS</p> <p>pH, at 6.5 -8.5</p> <p>COD at 60 (mg/l)</p> <p>BOD at 30 (mg/l)</p> <p>TSS at 1000 (mg/l)</p> <p>NHN at10 (mg/l)</p> <p>Presence /absence of functional awareness programme</p>	Quarterly during operation	Measure ments and report	100,000
							304

13	Disruption of public infrastructures and other utilities	<ul style="list-style-type: none"> • Provide fair and prompt compensation for affected public utilities and infrastructure 	TRC, Contractor	Number and types of replaced affected public utilities Presence/absence of functional grievance redress mechanism Number of cases of Public complain	In tandem with mobilization and construction	Field inspection, survey and Reports	50,000
		<ul style="list-style-type: none"> • Undertake appropriate engineering designs for under passes or over passes where appropriate 		Presence/absence of under/over passes in appropriate area			
14	Damming/po nding effect	<ul style="list-style-type: none"> • Construct series of well-designed culverts • Design bridges and culverts based on catchment characteristics 	TRC, Contractor	Presence/absence of functional bridges and culverts Presence/absence of stagnant water along the railway corridor Incidences of railway infrastructure destruction	Monthly in rainy season during construction and operation	Field inspection and reports	30,000

	Biodiversity loss	<p>Designate forested area for conservation to compensate the anticipated loss (offsetting the impact)</p> <p>Collaborate with relevant authorities like TFS, TAWA and LGAs to establish conservation/afforestation program around the project using local indigenous species</p> <p>Prepare and implement a Biodiversity Action Plan (BAP)</p> <p>Contractor to opt for viaduct or super-bridge flyover of an average of 18 m several underpasses within 1km in area identified as wildlife crossing</p> <p>Provide free access to wildlife movement across the SGR RoW</p>	TRC contractor	<p>Species Composition change over time</p> <p>Number of new species recorded</p>	Biannually	Field inspection and reports	15000
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	Habitat loss and /or alteration	<ul style="list-style-type: none"> • Ensure minimum footprint along the alignment by confining construction work within the acquired project areas • Enforce laws governing protection of rare endemic and endangered species • Ensure habitat restoration throughout the project footprint, • Prepare and implement a Biodiversity Action Plan (BAP) 	TRC/ Contractor	Size and type of habitat lost/altere d over time	Biannual y	Field inspectio n and reports	20000
	Damage and /or Alteration wetlands	<ul style="list-style-type: none"> • Ensure minimum footprint along the alignment by confining construction work within the acquired project areas • Enforce laws governing protection of rare endemic and endangered species • Ensure habitat restoration throughout the project footprint, • Prepare and implement a wetland restoration Action Plan (BAP) 	TRC Contractor LTWBB	Size altered/destroyed over time Composition changes over time	Biannual y	Field inspectio n and reports	30000

	Habitat fragmentation	<ul style="list-style-type: none"> • Avoid identified wildlife movement corridors, crossings and wetland sites that harbour high abundance of plant and animal species • Contractor to opt for viaduct or super-bridge flyover of an average of 18 m several underpasses within 1km in area identified as wildlife crossing 	TRC Contractor	Size and type of habitat in ha fragmented over time (Ha / Sq km)	Biannually	Field inspection and reports	30000
	Increased spread of invasive species	<ul style="list-style-type: none"> • Identify section affected by invasive species • Prepare invasive species eradication plan in collaboration with experts • Screen sources of construction materials by identifying all organism on identified sources • Mechanical removal invasive species in all areas encountered • Dispose spoil material to designated site 	TRC Contractor	Number, type and extent of spread of invasive species over time (Ha/Sq km)	Biannually	Field inspection and reports	30000

	Loss of rare, endangered and endemics species	<ul style="list-style-type: none"> • Enforce laws governing protection of rare endemic, migratory and endangered species • Ensure restoration & rehabilitation of all sites that will be impacted by SGR footprint, • Undertake frequent monitoring to ensure resumed functioning of the wetland ecosystems along the alignment 	TRC Contractor	Number and type of species Count over time	Biannually	Field inspection and reports	10000
	Impact to wildlife from Vehicle collision and roadkill	<ul style="list-style-type: none"> • Ensure road width, speed restrictions and traffic load in the areas in accordance to acceptable standards • Monitoring of wildlife accidents and roadkill along the alignment • Limit night-time construction works especially in areas with wildlife crossings and corridor 	TRC Contractor	Number and types of species killed Count over time Records of incidence of collision On	Monthly with quarterly report	Field inspection and reports	30000

	Risk of interference of wildlife movement corridors	<ul style="list-style-type: none"> Contractor to opt for viaduct or super-bridge flyover of an average of 18 m in area identified to as crossing Confine construction work within the acquired project areas (Stations, Marshalling Yard & Freight yard) Avoid identified wildlife movement corridors, crossings and wetland sites that harbour high abundance of plant and animal species Prepare and implement a Biodiversity Action Plan (BAP) 	TRC Contractor	<p>Number and types of species killed Count over time</p> <p>Reported cases of wildlife conflict in villages along SGR</p>	Monthly with quarterly report	Field inspection and reports	20000
	Loss /reduction of ecosystem services	<ul style="list-style-type: none"> Provide free access to resources across the SGR RoW Prepare and implement livelihood restoration plans based on forest conservation that benefit communities Prepare and implement a Biodiversity Action Plan (BAP) Ensure habitat restoration throughout the project footprint, Implement monitoring and evaluation programs to ensure minimum footprint beyond construction sites 	TRC Contractor	composition change over time	Biannually	Field inspection and reports	20000

	Damage and /or Alteration aquatic habitats (wetland areas)	<ul style="list-style-type: none"> • Enforce laws governing protection of rare endemic, migratory and endangered species • Confine construction activities to the core Area • Prepare wetlands restoration and rehabilitation plan • Ensure restoration & rehabilitation of all sites that will be impacted by SGR footprint, • Undertake frequent monitoring to ensure resumed functioning of the wetland ecosystems along the alignment 	RC Contractor LTWBB	<p>Size altered/destroyed over time</p> <p>Composition changes over time</p>	Biannually	Field inspection and reports	20000
17	Change in landscape and aesthetics	<ul style="list-style-type: none"> • Confine the project activities within designated core areas 	TRC Contractor	Incidences and extent of de-vegetation outside the core designated area	Quarterly during mobilization and construction	Field inspection, survey and report	Covered under loss of vegetation and biodiversity

CHAPTER TEN

10 COST BEST ANALYSIS OF THE PROJECT

10.1 Introduction

A cost/benefit analysis (CBA) is a systematic evaluation of the economic advantages (benefits) and disadvantages (costs) of a set of investment alternatives. Typically, a “Base Case” is compared to one or more Alternatives (which have some significant improvement compared to the Base Case). The analysis evaluates incremental differences between the Base Case and the Alternative(s). In other words, a benefit-cost analysis tries to answer the question: What additional benefits will result if this Alternative is undertaken, and what additional costs are needed to bring it about?

The CBA has covered the financial analysis, economic analysis of the project and an extended cost-benefit analysis for the proposed project. However, for the project to be judged viable or not, a comprehensive feasibility study that includes the costs related to the environmental impacts has to be included. Therefore, what is presented in this section is an ESIA component of the costs and benefits arising from the proposed development and based on the analysis of the impacts and benefits of the project.

10.2 Benefits related to the Project

There are several benefits associated with the proposed Uvinza – Kigadye railway development project both at local and international level in terms of revenue generation, improved transport, enhanced partnership between Tanzania and Burundi (Partner States) and the multiplier effects associated with linkages with local and national economy. The proposed railway project will generate employment opportunities during construction and operation, which to a large extent will be enjoyed by the local people with relevant skills. This opportunity will be supporting government initiatives to create employment opportunities and poverty alleviation. Due to the resulting employment opportunities, workers will gain additional incomes that will improve their quality of life and perhaps change their life style.

Despite the expected high demand of casual labour during construction, employment opportunities in technical areas will depend on whether there are suitably qualified local personnel that can take up positions in the project. Capacity building therefore is a prerequisite for these benefits to be realized. Another benefit to the local and national economy is in the form of construction material, agricultural products/goods and services, which local communities would certainly benefit by selling such goods and services to workers during construction and operation. Benefits to local communities are contingent upon putting in place specific policies and joint programs that would link investments in the area and the local economy so that local communities produce and offer several goods and services to the industrial development. The Government has a role to play to stimulate local communities to take advantage of the planned

development and overall industrial development. This would entail improving the quality of services and products that are offered to the sector.

10.3 Costs related to the project

The estimated cost for the construction of the proposed Uvinza – Kigadye railway project is about **1.45 billion USD**. The estimated costs for implementing enhancement measures, mitigation measures as well as monitoring process i.e., environmental and social management plan and environmental and social monitoring plan are **USD 2,630,704.61⁵** and **USD 2,130,000⁶** respectively as discussed in Chapters 8 and 9 of this report. These estimated costs for mitigation or enhancement measures does not include the full environmental costs, which could not be accurately calculated. Since some of the impacts will only to be realized during construction phase, the costs for these will also be short term, especially if mitigation measures are fully implemented.

⁵ This cost includes US\$ 1,495,704.61 proposed as cost for compensation as indicated in the RAP Report for Uvinza – Kigadye SGR Project (TRC, 2023).

⁶ This figure includes cos for RAP Performance Monitoring as the RAP Report for Uvinza – Kigadye SGR Project (TRC, 2023).

CHAPTER ELEVEN

11 CAPACITY BUILDING REQUIREMENTS FOR TRC TO IMPLEMENT ESMP

The implementation of various activities of the proposed railway project will require skills and expertise necessary to accomplish the obligation of the duties and responsibility as sole owner, implementer of all the railways infrastructure and related activities of the proposed project. There must be a team of experts within TRC capable of maintaining the infrastructure, doing the periodic maintenance of the rail infrastructures, servicing and repairing any damage to the rail infrastructures as per manufacture schedules or/ and in case of any emergencies.

This section highlights the capacity requirement for TRC to implement ESMP for the Uvinza –Kigadye Railway. First is the financial capacity to implement all the mitigation measures and monitoring the performance of the suggested mitigation measures. On financial capacity TRC must set aside enough budgets to implement all the mitigation measures on time and another budget for continuous monitoring of all parameters stated in ESMP.

Second is the human resources capacity in terms of skilled experts for addressing all the requirements stipulated in the ESMP. The human resources needs are those with engineering skills capable of handling needs created by the development of the railway sector. There is need for skilled engineers for maintenance of the railway itself, skills for maintenance of wagons and locomotives, bridges, signaling and telecommunication structures and those capable of dealing with railway line operation.

Similarly, environmental and social unit for monitoring railway line needs to have enough man power to fulfill the duties and the additional duties of implementing and monitoring changes of environmental related attributes following the implementation of the railway project. Considering the number of railway lines that are currently developed (SGR phase one from Dar es Salaam to Mwanza; SGR Phase 2:1 from Tabora to Kigoma) and those likely to be developed in a near future in Tanzania, development of the capacity to monitor environmental changes resulting from railway projects is crucial. The periodic monitoring stipulated in the ESMP must be monitored to check whether mitigation measures implemented are working effectively to avoid and minimize unforeseen impacts. Staff from TRC need to work in collaboration with district officials, independent environmental experts/ NGOs and government institutions and other sectors dealing with training on environmental issues, to monitor and implement environmental issues emanating from railway projects.

The environmental and social unit should build the capacity to develop environmental indicators that will be used to monitor the changes occurring overtime and set a means of evaluating the performance over time.

It is advantageous to TRC that it has gained experience in constructing SGR Project phase 1 (Dar es Salaam-Mwanza) in terms of design, construction and operation needs to make this Project succeed. Various trainings had been provided to the existing

Project teams to gain more skills and competent performances. The existing E&S team is now quite familiar with monitoring the Project in compliance with International Standards including World Bank Safeguards and IFC Performance standards. Furthermore, there is fully operational GRM system that is synchronized with the Environmental and Social database system for tracking and timely closure of grievances in Projects.

However, given the current situation where the Phase 1 construction is ongoing in both lots, the E&S team overstretches to accommodate expansion since they are under staffed. Moreover, multi disciplines are involved in monitoring the Projects, TRC team lacks some of the important specialists inhouse such as Biodiversity specialist and IP specialist; and needs to engage them in a time-based manner when they are required. This brings challenge in their availability vs the scheduled monitoring activities in the ESMP.

To fully execute this proposed Project in compliance with AfDB standards within timelines, the mentioned above challenges call for additional staffing who will be exclusively dedicated to the Project or hiring consultants who will work together with the TRC environmental and social unit to deal with the identified environmental and social concerns.

Table 11-1: Human Resources available for RAP implementation

Position	Minimum Requirement	Available	Gap
Environmental and Social Project Manager	1	1	0
RAP & Livelihood Restoration Implementation Advisor	1	1	0
Social Safeguards Manager	1	1	0
Environmental Safeguards Manager	1	1	0
M&E and Reporting Officer (Social)	1	1	0
M&E and Reporting Officer (Environment)	1	1	0
Data Management and Reporting Officer (s)	1	1	0
Community Liaison Officers ⁷	4	2	2
Environmental (or EHS) Officers	1	1	0
Interns (Social)	4	1	3

⁷ One CLO should be a person with experience with IP's related matters

Total	16	11	5
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On other hand, ESMP, RAP and LRP implementation requires continuous capacity building for internal staff, ESMP, and RAP Implementation Committee/Team and community representatives/stakeholders. Enhanced capacity will increase the chances of the team to implement ESMP, RAP and LRP per local and international standards. The training needs assessment should be conducted to indicate appropriate courses and skills that need to be developed to ensure the team and staff implements ESMP and RAP effectively and efficiently. At the moment, Table 11-2 recommended areas for capacity-building training for the Uvinza to Kigadye SGR Project.

Table 11-2: Proposed capacity building

Item	Description	capacity building activities	Output	Lead	Participants	Cost (TZS)	Cost (USD)
Integrated E&S plan	Most project designing and land acquisition-related activities are being initiated without the engagement of the E&S team	Workshop sessions on the importance of integrating the E&S in the broader project decision-making and planning	Developed an integrated plan to enhance vertical and horizontal coordination	<ul style="list-style-type: none"> ESMP and RAP advisor 	PMs, DPMs, land department, finance department, E&S team & RAP Implementation Committee	100,000,000	42,844.90
Awareness of National and International performance standards	Inadequate knowledge of the International Performance Standards (IFC PS & EP4) and National laws and regulations among the project implementers	Awareness-raising workshop on matters related to International Performance Standards and National laws and regulations (see Chapter 2)	Enhanced awareness of IFC Performance Standards and Equator principles and their implications on project progress	<ul style="list-style-type: none"> ESMP and RAP advisor 	<ul style="list-style-type: none"> Ministry of Finance and Planning Ministry of Works and Transport Ministry of Lands Attorney General Office TRC RAP Implementation Committee 	200,000,000	85,689.80
Functionality/appl icability of	TRC developed a database system that	<ul style="list-style-type: none"> Practical training on database 	The existence of an	<ul style="list-style-type: none"> ESMP and 	PMs, DPMs, land	200,000,000	85,689.80

Item	Description	capacity building activities	Output	Lead	Participants	Cost (TZS)	Cost (USD)
database system	keeps/stores key project information with regards to PS5 but key project custodians (PMs, DPMS, land and finance department) are not much familiar with the system in terms of applicability. Also, for data accuracy, further improvements are required in the system	<p>applicability to land acquisition and compensation activities</p> <ul style="list-style-type: none"> System improvement as per PS requirements 	<p>implementable database system with accurate data for project monitoring, decision-making process and other future uses</p> <p>Increased knowledge of database management</p>	RAP advisor	department, finance department, E&S team & RAP Implementation Committee		
Grievance Redress Mechanism	Most of the reported grievances are not timely closed as required by National and International performance standards	Workshop sessions on the GRM functionality	Establishment of functional channels for receiving and responding to the reported project grievances	<ul style="list-style-type: none"> ESMP and RAP advisor 	<ul style="list-style-type: none"> E&S team TRC land department TRC-Customer care unit MEO VEO RAP Implementation Committee 	100,000,000	42,844.90
Participation of local government	Local Government officials'	Workshops to be undertaken in each	Developing a commitment plan	<ul style="list-style-type: none"> ESMP and 	<ul style="list-style-type: none"> Government officials 	240,000,000	102,827.76

Item	Description	capacity building activities	Output	Lead	Participants	Cost (TZS)	Cost (USD)
authorities and District officials in LRP implementation	representatives are not well equipped with the knowledge necessary to ensure that they can actively participate in RAP implementation.	region where the basic approaches to RAP planning and implementation should be taught	with the expected deliverables of the developed LRP (see Chapter 9)	RAP advisor	from project areas <ul style="list-style-type: none"> RAP Implementation Committee 		
Stakeholders Engagement Plan (SEP)	The existing SEP is well implemented. Special groups and minorities (vulnerable) are supposed to be frequently consulted	Workshop sessions on the best approach to reach all groups of vulnerable as mentioned in the IFC Performance standards	Development of specific methodology for vulnerable groups	<ul style="list-style-type: none"> ESMP and RAP advisor 	<ul style="list-style-type: none"> E&S team RAP Implementation Committee 	50,000,000	21,422.45
Leadership training for effective project management and implementation	TRC management, the E&S team and RAP Implementation Committee should be provided with leadership training for effective project management and implementation	Key modules such as leadership for emotional intelligence, improved communication and interpersonal skills, Organizational, people and personal leadership, Leadership of effective teams, Strategic thinking, Problem analysis and decision-making may be considered	Enhanced leadership competencies to senior management team & staff	<ul style="list-style-type: none"> UONGOZI Institute 	<ul style="list-style-type: none"> TRC Management E&S team RAP Implementation Committee RAP Advisor 	200,000,000	85,689.80
Data analysis and management	Development of comprehensive course on data	Key aspects such as data collection methods and tools,	Enhancing knowledge and skills on data	<ul style="list-style-type: none"> UDSM Department of 	<ul style="list-style-type: none"> E&S team Data 	560,000,000	239,931.45

Item	Description	capacity building activities	Output	Lead	Participants	Cost (TZS)	Cost (USD)
	analysis and management	data analysis, data management and reporting and monitoring	analysis and management	Statistics	Management and Reporting Officer <ul style="list-style-type: none"> • M&E Officer • RAP Implementation Committee 		
Total						1,450,000,000	621,251.06

SUMMARY AND RECOMMENDATIONS

The implementation of the proposed Uvinza – Kigadye railway with associated infrastructures represents a significant infrastructure development linking Burundi as Land locked country to Tanzania. The project will have significant contribution to regional integration, regional business and ease transportation of massive cargo from various potential mining areas on Burundian side and agricultural potential of western Tanzania. The environmental assessment of the proposed undertaking indicates that there are components and activities of the project that will generate significant environmental concerns. The ESIA statement has pointed out to several negative impacts likely to occur following the implementation of various project activities. Similarly, a corresponding environmental and social mitigation option for identified impact and monitoring plan have been developed to offset and control the foreseen impact from causing significant damage to the environment, project and the surrounding communities. The costs for implementing mitigation and monitoring plans have also been prepared together with responsible institution and the timeframe for implementing various corrective measures. Considerations need to be taken with regards to mitigation of cumulative and residual environmental impacts such as land take and land acquisitions that are likely to occur. The ultimate goal is to enhance the foreseen benefits that the proposed project will produce environmentally, socially and economically. However, in order to realize the benefit from the railway infrastructure, development of mining sector, industrial development and agriculture sector in Tanzania, Burundi and other nearby countries of Rwanda and DRC Congo need to be performing well.

The nature of the undertaking involves two different countries with different administrative, policy and legal frameworks governing the social, economic, environment and political development. This requires a well-structured institutional arrangement with strong coordination to stir the planned development in terms of synchronized planning of activities related to railway systems as well as regional coordination of the implementation of the program to ensure its timely implementation. The main challenge will be timely and synchronized sourcing of funds for implementation of the section of the railway among the member states. Other challenges include inadequate skilled manpower, and lack of capacity to coordinate and mainstream environmental issues directed by the Tanzania Environmental Management Act 2004.

The typical cost benefit analysis of the project to evaluate the benefit in economic terms has not been done due to limited information like the volume of cargo anticipated, wagon freight capacity and frequency of operational per day. Given the potential in terms of mineral resources available, agricultural potential and industrial development in the area traversed by the project, the proposed development will contribute significantly to economic development of the two countries. In addition to economic activities the proposed undertaking will provide transport services to the citizens and enhance regional integration and cooperation and benefiting from improved transportation, efficiency operation of ports and savings from road maintenance and improved services

to the communities in Tanzania, Burundi and other East African Countries opting to use this railway.

The ESIA therefore ***recommends that the proposed development should be considered for development as it meets the relevant policy objectives and will provide services to the communities and stimulate other sectors of development.*** However, the proposed mitigation and enhancement measures recommended in this ESIA must be implemented in order to ensure that project benefits are realized or optimized.

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12 ANNEXES

12.1 Terms of References

for Undertaking Environmental and Social Impact Assessment (ESIA) of a Proposed Construction of Railway Line from Uvinza to Kigadye in Kigoma Region Tanzania

The railway transport sector in Tanzania under the Tanzania Railway Corporation has played a significant role in the Economic Development of Tanzania and her neighboring countries, particularly the land locked countries through providing transport services for both freight and passengers within the country and transit freight to and from neighboring countries of Burundi, Rwanda, Democratic Republic of Congo and Uganda. Until the late 1980's the number of passengers and freight traffic per annum continued to indicate a steady growth to a record high of 683,861 passengers and 1,442,713 tons respectively in 2003 (Tanzania Transport Sector Review, 2013).

The EAC Treaty highlights the need for cooperation in the use of infrastructure and services, in particular in transport and communication, in order to support regional integration and socio-economic development (EAC Treaty, 2010). It also stresses the need for coordinated, harmonized, and complementary transport policies; improvement and expansion of existing links; and establishment of new ones including the Uvinza-Musongati-Gitega railway line as a means of furthering the physical cohesion of the member countries, and facilitating intra-regional commerce and global connectivity (*ibid*). The EAC and the Partner States have put in place short- and long-term policies and strategies prioritizing projects and programs for economic development. The outcome of their implementation will alleviate constraints and bottlenecks along a value chain, improve connectivity for ease of flow of goods and services, add value to the regional economy and facilitate a competitive regional economy that attracts investment, thus creating economic growth, as well as jobs and subsequently poverty alleviation (*ibid*).

The proposed new Electrified Standard Gauge railway line from Uvinza (Tanzania) to Musongati -Gitega (Burundi) with a planned length of 282 km-route, will constitute an integral part of a new international trade corridor from the Tanzanian Central Railway Line link in Uvinza to the mining area in Musongati, Burundi. The aim is to connect the mining area around Musongati to world trade, via Dar es Salaam seaport but also, to a significantly lesser extent, with the DR Congo through a proposed SGR extension from Gitega to Kindu, DRC. According to the study commissioned by the African Development Bank in 2009, Burundi is among the 10 countries in the world that have important deposits of nickel as well as by-products (cobalt, copper, iron, platinum group elements) untapped. The most important deposit is the one of Musongati with estimated 185 million tons of nickel. This mining area needs a reliable freight and passenger transport connection with sufficient capacity to the central railway line

in Tanzania. Therefore, the Uvinza–Musongati -Gitega railway line is one of the priority projects in Burundi.

The Project will be undertaken as a Design and Build Contract and the RAMS (Reliability, Availability, maintainability, and Safety) is the basic requirement for Infrastructure and all Systems under this Project. Furthermore, Design and construction shall comply with National and International guidelines on Environmental and social safeguards. The works involves the Design and Build of New Railway line consisting of Earthworks, Elevated Structure, Culverts, Tunnels, Viaduct, Permanent way, stations, buildings and shops, fencing of the line, signaling & telecommunications, IT systems and Electrification Systems of the standard gauge (1,435 mm) railway line from Uvinza-Musongati-Gitega (approximately 282km Main line and 85 Km Sidings/ Passing Loops. This ESIA report covers the part within Tanzania (Uvinza to Kigadye Village in Kasulu District (at the Tanzania- Burundi border) and does not include the Burundi side.

Tanzania and Burundi are determined to implement the railway project as a way to improve the main trade route linking Burundi via Uvinza to the Dar es Salaam port. According to the study commissioned by the African Development Bank in 2009, Burundi is among the 10 countries in the world that have important deposits of nickel as well as by-products (cobalt, copper, iron, platinum group elements) untapped. The most important deposit is the one of Musongati with estimated 185 million tons of nickel. This mining area needs a reliable freight and passenger transport connection with sufficient capacity to the central railway line in Tanzania. Therefore, the Uvinza–Musongati -Gitega railway line is a priority project in Burundi.

The Government of Tanzania through TRC has invested a lot in SGR development to link the Dar es Salaam Port with Mwanza and Kigoma with provision to link neighboring countries of Burundi, Uganda, Rwanda and Congo DRC. The SGR railway from Dar es Salaam to Mwanza is implemented in various lots. Lot 1 and Lot 2 Dar es Salaam to Morogoro and to Makutopora is nearly completed, while Lot 3 and Lot 4 (Makutopora -Tabora-Isaka) and Lot 5 (Isaka -Mwanza) and lot 6 (Tabora-Kigoma) are at various stages of construction. The Uvinza-Kigadye (on the Tanzania side) or Uvinza - Musongati – Gitega (as previously planned) is a linear project traversing from Uvinza and Buhigwe and Kasulu Districts in Kigoma Region. The Tanzania side of the planned SGR ends at Kigadye Vilage in Kasulu District, at the border with Burundi. Another line extends from there to Gitega in Burundi and plans are underway to extend it to DRC Congo.

The proposed railway line is expected to link with the new SGR line from Tabora to Kigoma now under construction. From the starting point at Uvinza the proposed railway line will traverse through Kasulu and Buhigwe district before crossing Malagarasi River boarder running into Burundi. The railway

development project covers the components such as acquisition of the railway corridor (way leave), track, station, bridges, signaling and communication network, dump sites, borrow pits, rock quarry sites, marshalling yard and maintenance depots. The new Uvinza-Kigadye (Kasulu District) railway line will be based on the American Railway Engineering and Maintenance of Way Association (AREMA) latest standards (which promote inter-operability) – that is the Standard Gauge, allowing for increased design speed of 160 km/h for passenger trains and of 120 km/h for freight trains. Development of this railway line will open up the mineral - rich Musongati and other remote area of Tanzania and boost trade with Burundi as the line will connect to the capital City, Gitega and possibly extend to DRC Congo.

The main objectives of the project are summarized thus.

- i. Develop a reliable, cost-effective, efficient and seamless railway transport system to Burundi from the coast of the Indian Ocean
- ii. Provide efficient and affordable transport services, and promote trade, regional economic integration and the development of mining, manufacturing and agriculture within the corridor area
- iii. Increase transport safety and protection of the environment
- iv. Allow the interoperability with new railway line by modernizing standards

Increase the railway speeds and haulage capacity more than the existing railway line.

Aim and Objectives

The project aimed at opening up Msongati Nickel rich deposits for exploration and boosting promotion of the private project investment in mineral resource development, improving transportation of goods including up to 3 million tones of nickel per year from Msongati (Burundi) through the Dar es Salaam Port of Tanzania. Moreover the development of this new railway line will increase regional connectivity and enhance regional integration, business as well as open up relatively remote areas on the Burundi side. It is also intended to reduce maintenance cost the two governments incur on road infrastructure. This development is expected to lead to the following:

Activities

The EIA team shall undertake the following activities:

- Consult with various key stakeholders including, but not limited to the ones identified during scoping in order to capture their views and concerns regarding the proposed development.
- Describe the present physical, biological and socio-cultural environment that would be directly and/or indirectly affected by the proposed development.

- Consider all potential negative and positive impacts arising from the proposed development, with emphasis on the following issues:
 - Impact to local biodiversity including wildlife corridors, dispersal areas and migration
 - Revenue and employment creation
 - Use of local resource (such as construction materials including water)
 - Cumulative effect on waste management
 - Levels of energy use and sources
 - Benefit and cost to communities
 - Benefit to local and national economy
 - Analysis of cumulative, residual and trans-boundary impacts;
 - Impacts on non-renewable and valueless resources including archaeological and cultural artefacts
- Consider project alternatives such as location, design, technology and operating and maintenance procedures and compare these alternatives in terms of potential environmental impacts.
- Carry out evaluation of the levels of impact significance
- Ensure adequate stakeholder participation throughout the ESIA process and show stakeholders views and concerns in the ESIA report
- Prepare an Environmental Management Plan (EMP) for the proposed development detailing mitigation measures, mitigation plan, monitoring plan as well as clearly defined responsibilities for various key players/institutions for the implementation of the EMP.
- Describe various policies, legal and institution framework relevant to the project.
- Undertake a cost benefit analysis of the proposed project
- Prepare ESIA report which must contain the following information:
 - Executive summary;
 - Acknowledgement;
 - Acronyms;
 - Introduction;
 - Project background and description;
 - Policy, administrative and legal framework;
 - Baseline or existing conditions;
 - Assessment of impacts and identification of alternatives;
 - Impacts management or environmental mitigation measures;
 - Environmental and social management plan
 - Resource evaluation or cost benefit analysis;
 - Decommissioning;
 - Summary and conclusion
 - References;
 - Appendices;

The Cover page of the Environmental and Social Impact Statement must have the following information:

- Title of the proposed project;
- Location of proposed development;
- Developer and his address;
- Lead consultants;
- Contact address and phone;
- Date of submission.

The ESIA Report will also contain an executive summary that contains the following information.

- Title and location of the project or undertaking;
- Name of the proponent and contact;
- Names and addresses of experts or firms of experts conducting EIA;
- A brief outline and justification of the proposed project or undertaking showing:
 - A brief description of the project environment;
 - Project stakeholders and their involvement in the EIA process;
 - Explanation on why some impacts are not addressed;
 - List of developer, consultant, local planning authorities and other people and organizations consulted
 - Results of public consultation
 - Description of the major significant impacts;
 - Alternative considered;
 - Recommendations and plan for mitigation of the impacts;
 - Environmental and social management;
 - Proposed monitoring and auditing; and
 - Resource evaluation or cost benefits analysis.

Methodology

An ESIA is an open participatory process; the ESIA team is therefore required to ensure that appropriate methods that would ensure maximum participation of all key stakeholders are followed. Methods such as consultations with key stakeholders, interviews, meetings, and focus group discussions shall be used. The ESIA team must also visit the proposed site and consult with relevant stakeholders on the site for detailed information and their concerns. Other methods shall include search for information from secondary sources available from various sources as well as methodologies on the following aspects shall be used:

- Archaeology
- Engineering and
- Ecological
- Socio-economics

Expected Output and Deliverables

The ESIA team should produce and submit a draft Environmental Impact Statement (EIS) to the NEMC for review and comments. The team shall incorporate all relevant comments to the report and produce final EIS, which will be handed to the developer for submission to the National Environment Management Council (NEMC) for review.

The ESIA report shall follow guidelines and outline stipulated under subsection VII on the section detailing activities in this ToR.

Expertise to be involved

The team shall consist of the following key experts.

- Sociologist and ESIA – Team leader
- Socio-Economist and Public Participation and ESIA
- Ecologist and ESIA Expert
- Land use and ESIA Expert
- Botanists and ESIA Expert
- Archaeologist

Additional experts will be called in when needed.

Assignment Period

The ESIA process shall take at least 60 days from the date the ToR are approved.

12.2 Plant species recorded within the project foot print

BOTANICAL NAME	HABIT	FAMILY	REMARKS
<i>Acacia polyacantha</i>	Tree	Fabaceae	
<i>Acacia robusta</i>	Tree	Fabaceae	
<i>Acalypha chirindrica</i>	Shrub	Euphorbiaceae	
<i>Acanthus pubescens</i>	Shrub	Acanthaceae	
<i>Afzelia quanzensis</i>	Tree	Fabaceae	CITIES Appendix II
<i>Agathisanthemum bojeri</i>	Shrub	Rubiaceae	
<i>Ageratum conyzoides</i>	Herb	Asteraceae	
<i>Albizia antunesiana</i>	Tree	Fabaceae	
<i>Albizia petersiana</i>	Tree	Fabaceae	

<i>Albizia versicolor</i>	Tree	Fabaceae	
<i>Alchornea cordifolia</i>	Shrub	Euphorbiaceae	
<i>Allophylus congolanus</i>	Shrub	Sapindaceae	
<i>Anisophyllea boehmii</i>	Tree	Rhizophoraceae	
<i>Anthocleista glandiflora</i>	Tree	Loganiaceae	
<i>Antidesma venosum</i>	Shrub	Euphorbiaceae	
<i>Artabotrys monteiroae</i>	Liana	Annonaceae	
<i>Bauhinia petersiana</i>	Tree	Fabaceae	
<i>Berchemia discolor</i>	Tree	Rhamnaceae	
<i>Blepharis affinis</i>	Herb	Acanthaceae	
<i>Borassus aethiopum</i>	Tree	Arecaceae	
<i>Boscia salicifolia</i>	Tree	Capparaceae	
<i>Brachystegia boehmii</i>	Tree	Fabaceae	
<i>Brachystegia longifolia</i>	Tree	Fabaceae	
<i>Brachystegia spiciformis</i>	Tree	Fabaceae	
<i>Bridelia cathartica</i>	Shrub	Euphorbiaceae	
<i>Bridelia scleroneura</i>	Shrub	Euphorbiaceae	
<i>Burkea africana</i>	Tree	Fabaceae	
<i>Caesalpinia decapetala</i>	Shrub	Fabaceae	
<i>Cajanus cajan</i>	Shrub	Fabaceae	
<i>Canthium burtii</i>	Shrub	Rubiaceae	
<i>Canthium lactescens</i>	Shrub	Rubiaceae	
<i>Cassipourea mollis</i>	Shrub	Rhizophoraceae	
<i>Catunaregam spinosa</i>	Shrub	Rubiaceae	
<i>Centella asiatica</i>	Herb	Apiaceae	
<i>Ceratophyllum demersum</i>	Herb	Ceratophyllaceae	
<i>Chionanthus niloticus</i>	Shrub	Oleaceae	
<i>Cissampelos mucronata</i>	Climber	Menispermaceae	

<i>Cissampelos pareira</i>	Climber	Menispermaceae	
<i>Cissus cornifolia</i>	Shrub	Vitaceae	
<i>Citrulus lanatus</i>	Climber	Cucurbitaceae	
<i>Citrus sinensis</i>	Shrub	Rutaceae	
<i>Cleistachne sorghoides</i>	Grass	Poaceae	
<i>Clematopsis scabiosifolia</i>	Herb	Ranunculaceae	
<i>Cola microcarpa</i>	Tree	Sterculiaceae	
<i>Combretum adenogonium</i>	Tree	Combretaceae	
<i>Combretum collinum</i>	Tree	Combretaceae	
<i>Combretum molle</i>	Tree	Combretaceae	
<i>Combretum psidioides</i>	Tree	Combretaceae	
<i>Combretum zeyheri</i>	Tree	Combretaceae	
<i>Commiphora mollis</i>	Tree	Burseraceae	
<i>Conyza bonariensis</i>	Herb	Asteraceae	
<i>Costus macranthus</i>	Herb	Zingiberaceae	
<i>Craibia brevicaudata</i>	Tree	Fabaceae	
<i>Crossopteryx febrifuga</i>	Tree	Rubiaceae	
<i>Cussonia arborea</i>	Tree	Araliaceae	
<i>Cyperus articulatus</i>	Sedge	Cyperaceae	
<i>Cyperus exaltatus</i>	Sedge	Cyperaceae	
<i>Cyperus papyrus</i>	Sedge	Cyperaceae	
<i>Cyperus rotundus</i>	Sedge	Cyperaceae	
<i>Dalbergia lactea</i>	Liana	Fabaceae	
<i>Dalbergia melanoxylon</i>	Tree	Fabaceae	
<i>Dalbergia nitidula</i>	Tree	Fabaceae	
<i>Desmodium barbatum</i>	Herb	Fabaceae	NT , CITIES Appendix II
<i>Dichrostachys cinerea</i>	Shrub	Fabaceae	
<i>Diospyros kirkii</i>	Tree	Ebenaceae	

<i>Diospyros natalensis</i>	Shrub	Ebenaceae	
<i>Diplorhynchus condylocarpon</i>	Tree	Apocynaceae	
<i>Dombeya rotundifolia</i>	Shrub	Sterculiaceae	
<i>Duosperma crenatum</i>	Herb	Acanthaceae	
<i>Echinochloa colona</i>	Grass	Poaceae	
<i>Echinochloa haploclada</i>	Grass	Poaceae	
<i>Elaeis guineensis</i>	Tree	Arecaceae	
<i>Eleusine indica</i>	Grass	Poaceae	
<i>Entada abyssinica</i>	Tree	Fabaceae	
<i>Erythrina abyssinica</i>	Tree	Fabaceae	
<i>Erythrocephalum minus</i>	Herb	Asteraceae	
<i>Euphorbia tirucalli</i>	Shrub	Euphorbiaceae	
<i>Ficus exasperata</i>	Tree	Moraceae	
<i>Ficus lutea</i>	Tree	Moraceae	
<i>Ficus sur</i>	Tree	Moraceae	
<i>Flacourtia indica</i>	Tree	Flacourtiaceae	
<i>Flueggea virosa</i>	Shrub	Euphorbiaceae	
<i>Friesodielsia obovata</i>	Shrub	Annonaceae	
<i>Fuirena ciliaris</i>	Sedge	Cyperaceae	
<i>Gardenia imperialis</i>	Shrub	Rubiaceae	
<i>Gardenia ternifolia</i>	Tree	Rubiaceae	
<i>Grewia bicolor</i>	Tree	Tiliaceae	
<i>Harungana madagascariensis</i>	Tree	Clusiaceae	
<i>Hexalobus monopetalus</i>	Tree	Annonaceae	
<i>Hollarhena pubescens</i>	Shrub	Apocynaceae	
<i>Hygrophila auriculata</i>	Herb	Acanthaceae	
<i>Hymenocardia acida</i>	Shrub	Hymenocardiaceae	
<i>Hyparrhenia filipendula</i>	Grass	Poaceae	

<i>Hyparrhenia rufa</i>	Grass	Poaceae	
<i>Hyptis suaveolens</i>	Herb	Lamiaceae	
<i>Imperata cylindrica</i>	Grass	Poaceae	
<i>Indigofera rhynchocarpa</i>	Shrub	Fabaceae	
<i>Ipomoea aquatica</i>	Herb	Convolvulaceae	
<i>Ipomoea batatas</i>	Herb	Convolvulaceae	
<i>Isoberlinia angolensis</i>	Tree	Fabaceae	
<i>Julbernardia globiflora</i>	Tree	Fabaceae	
<i>Julbernardia seretii</i>	Tree	Fabaceae	Guinea-Congolian species in FWTB pp.471 extending new record for T4
<i>Julbernardia unijugata</i>	Tree	Fabaceae	Endemic to T4
<i>Lannea edulis</i>	Shrub	Anacardiaceae	
<i>Lantana triphylla</i>	Shrub	Verbenaceae	
<i>Leersia hexandra</i>	Grass	Poaceae	
<i>Leonotis nepetifolia</i>	Herb	Lamiaceae	
<i>Lippia javanica</i>	Shrub	Verbenaceae	
<i>Loudetia simplex</i>	Grass	Poaceae	
<i>Magnistipula bangweolensis</i>	Tree	Chrysobalanaceae	
<i>Mangifera indica</i>	Tree	Anacardiaceae	
<i>Manihot esculenta</i>	Shrub	Euphorbiaceae	
<i>Margaritaria discoidea</i>	Shrub	Euphorbiaceae	
<i>Markhamia obtusifolia</i>	Tree	Bignoniaceae	
<i>Maytenus senegalensis</i>	Shrub	Celastraceae	
<i>Melanthera scandens subsp madagascariensis</i>	Herb	Asteraceae	
<i>Melinis repens</i>	Grass	Poaceae	
<i>Mimosa pigra</i>	Shrub	Fabaceae	
<i>Monotes africanus</i>	Tree	Dipterocarpaceae	

<i>Multidentia crassa</i>	Shrub	Rubiaceae	
<i>Musa spp.</i>	Herb	Musaceae	
<i>Musaenda arcuata</i>	Shrub	Rubiaceae	
<i>Neorautanenienia mitis</i>	Herb	Fabaceae	
<i>Nymphaea alba</i>	Herb	Nymphaeaceae	
<i>Ochna schweinfurthiana</i>	Shrub	Ochnaceae	
<i>Oldfieldia dactylophylla</i>	Tree	Euphorbiaceae	
<i>Oryza longistaminata</i>	Grass	Poaceae	
<i>Oryza sativa</i>	Grass	Poaceae	
<i>Ozoroa insignis</i>	Tree	Anacardiaceae	
<i>Parinari curatellifolia</i>	Tree	Chrysobalanaceae	
<i>Paullinia pinnata</i>	Climber	Sapindaceae	
<i>Pennisetum polystachion</i>	Grass	Poaceae	
<i>Pennisetum purpureum</i>	Grass	Poaceae	
<i>Pericopsis angolensis</i>	Tree	Fabaceae	
<i>Persea americana</i>	Tree	Lauraceae	
<i>Phoenix reclinata</i>	Tree	Arecaceae	
<i>Phragmites mauritianus</i>	Grass	Poaceae	
<i>Phyllanthus muellerianus</i>	Shrub	Phyllanthaceae	
<i>Phyllocosmus lemaireanus</i>	Tree	Ixonanthaceae	
<i>Piliostigma thonningii</i>	Tree	Fabaceae	
<i>Pinus patula</i>	Tree	Pinaceae	
<i>Polystachya sp.</i>	Herb	Orchidaceae	
<i>Pseudolachnostylis maprouneifolia</i>	Tree	Euphorbiaceae	
<i>Psorospermum febrifugum</i>	Shrub	Clusiaceae	
<i>Pterocarpus angolensis</i>	Tree	Fabaceae	
<i>Pterocarpus tinctorius</i>	Tree	Fabaceae	CITIES Appendix III
<i>Rhoicissus tridentata</i>	Shrub	Vitaceae	

<i>Rothmannia engleriana</i>	Shrub	Rubiaceae	
<i>Rubus pinnatus</i>	Climber	Rosaceae	
<i>Saba comorensis</i>	Liana	Apocynaceae	
<i>Saccharum officinarum</i>	Shrub	Poaceae	
<i>Sapium ellipticum</i>	Tree	Euphorbiaceae	
<i>Schrebera trichoclada</i>	Tree	Oleaceae	
<i>Senna obtusifolia</i>	Herb	Fabaceae	
<i>Senna singueana</i>	Shrub	Fabaceae	
<i>Setaria homonyma</i>	Grass	Poaceae	
<i>Smilax anceps</i>	Climber	Smilacaceae	
<i>Sphaeranthus suaveolens</i>	Herb	Asteraceae	
<i>Steganotaenia araliacea</i>	Shrub	Apiaceae	
<i>Stereospermum kunthianum</i>	Tree	Bignoniaceae	
<i>Strophanthus eminii</i>	Shrub	Apocynaceae	
<i>Strychnos cocculoides</i>	Tree	Loganiaceae	
<i>Strychnos madagascariensis</i>	Tree	Loganiaceae	
<i>Strychnos potatorum</i>	Tree	Loganiaceae	
<i>strychnos spinosa</i>	Tree	Loganiaceae	
<i>Syzygium cordatum</i>	Tree	Myrtaceae	
<i>Syzygium guineense subsp. macrocarpa</i>	Tree	Myrtaceae	
<i>Tamarindus indica</i>	Tree	Fabaceae	
<i>Terminalia mollis</i>	Tree	Combretaceae	
<i>Terminalia sericea</i>	Tree	Combretaceae	
<i>Tetracera masuiana</i>	Shrub	Dilleniaceae	
<i>Themeda triandra</i>	Grass	Poaceae	
<i>Thespesia garckeana</i>	Tree	Malvaceae	
<i>Trema orientalis</i>	Tree	Ulmaceae	
<i>Triumfetta rhomboidea</i>	Herb	Tiliaceae	

<i>Typha domingensis</i>	Herb	Typhaceae	
<i>Uapaca kirkiana</i>	Tree	Euphorbiaceae	
<i>Uapaca nitida</i>	Tree	Euphorbiaceae	
<i>Vangueria madagascariensis</i>	Shrub	Rubiaceae	
<i>Vernonia glabra</i>	Herb	Asteraceae	
<i>Vernonia perrottetii</i>	Herb	Asteraceae	
<i>Vitex doniana</i>	Tree	Verbenaceae	
<i>Vitex madiensis</i>	Tree	Verbenaceae	
<i>Vitex mombassae</i>	Tree	Verbenaceae	
<i>Ximenia americana</i>	Shrub	Olacaceae	
<i>Ximenia caffra</i>	Shrub	Olacaceae	
<i>Ziziphus abyssinica</i>	Tree	Rhamnaceae	

12.3 Summary of Stakeholders Views and Concerns

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
Kigoma RS	FGD	2023-06-19	12	11	1	<ul style="list-style-type: none"> • Compensation to the affected properties is very critical • Land acquisition Act should be applied • Avoid frequent change of alignment as it might confuse people • Replacement be applied • Improve road infrastructure in rural areas connecting to the proposed SGR line • Expansion and improvement of Kigoma port to receive heavy cargo • Provide public awareness on advantages and disadvantages of project • Complaints from the PAPs should timely addressed 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<ul style="list-style-type: none"> Valuation process should be transparent and participatory to avoid complaints Involve Community Development Officers during project implementation There is a potential for land scape change due to borrow pits, quarry sites and dumping sites, measures should be taken to restore the affected land. Influx of people may lead to pressure on available social services 	
Uvinza District Commissiner	Interview					<p>The proposed railway line will have potential for transportation of salt from Uvinza</p> <p>The railway line through Kasulu district would enhance business between Kasulu and Burundi.</p>	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>Uvinza is growing fast and currently there is electricity population and economic activities are increasing simultaneously the proposed railway line will enhance the development of the district.</p> <p>Burundi is the main market of maize produced in both Uvinza and Kasulu district; the presence of the proposed railway line would ease transportation and therefore enhance business.</p> <p>Awareness on HIV and AIDS should be provided to the communities along the corridor.</p> <p>Consultation and engagement should be done at all levels from the Region to</p>	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>community so as to minimize the rate of crime during implementation of the proposed project.</p> <p>The project will increase employment opportunities therefore, conditions for applying jobs or laborer should be specified for applicants during the implementation of the project.</p> <p>Awareness on project should be provided before starting the project.</p> <p>The issues of land to be properly managed by involving land experts to reduce land disputes.</p> <p>Proactive prevention education on communicable diseases to be</p>	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						emphasized during awareness campaign. •	
Uvinza District Council	FGD	2023-06-15	4	0	5	<ul style="list-style-type: none"> The proposed project will stimulate the economy of Kigoma and the country at large The project will interfere the current land use plan in several villages such Ruchugi and Basanza where people have land title deeds The project developer should consider to facilitate the cost for preparing new land use plans Influx of people will lead to accommodation problems and other social services 	
Kasulu District Council	Public meeting	2023-06-21	6	6	0	<ul style="list-style-type: none"> What criteria were used to locate the railway station along the proposed alignment? Nyakitonto village and ward should be considered for locating a railway 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>station because it is a new headquarter of the council and it is connected to other villages through feeder roads.</p> <ul style="list-style-type: none"> • It is also potential for agricultural production and saves as market for various agricultural production • There is international market and warehouse for agricultural products • Compensation issues should be cleared before the construction activities. It has causing many problems to the district authority • Involve other institutions such as Tarura and Ruwasa during project implementation • Ensure protection of rivers and streams used for irrigation • Land acquired for construction materials such as quarry sites, borrow pits, camp sites, dumping sites and 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>accesss roads should be properly compensated</p> <ul style="list-style-type: none"> Crossings for cattle and human, ensure no competition for social services with construction workers 	
Kasulu Council Town	FGD	2023-06-22 14-06-2023	4			<ul style="list-style-type: none"> The livestock keepers close to the proposed SGR The beekeeping activities in the villages close to the SGR project The status of Gender related issues in area close to the SGR project. TRC representatives wanted to know the Gender roles. Special groups available in District Any plans/activities/programmes for development in the areas 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>close to `proposed SGR</p> <ul style="list-style-type: none"> • There are no wildlife corridors within/close to the proposed SGR line but the common wildlife are monkeys • Are there wetlands within or close to the SGR. • TRC representatives wanted to know if there are land use plans. • The common land use conflict and how they are being resolved • TRC wanted to know if there is any information on migration into the areas within the project area • Infrastructure is important for development and business; the proposed Uvinza – Msongati railway line will enhance rural developments • Taking into consideration the 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>issue of immigrants,</p> <ul style="list-style-type: none"> • Use of TC owned borrow pit and Quarry site already used for road constructions • • The livestock keepers close to the proposed SGR • The beekeeping activities in the villages close to the SGR project • The status of Gender related issues in area close to the SGR project. • TRC representatives wanted to know the Gender roles. • Special groups available in District • Any plans/activities/programmes for development in the areas 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>close to `proposed SGR</p> <ul style="list-style-type: none"> • There are no wildlife corridors within/close to the proposed SGR line but the common wildlife are monkeys • Are there wetlands within or close to the SGR. • TRC representatives wanted to know if there are land use plans. • The common land use conflict and how they are being resolved • TRC wanted to know if there is any information on migration into the areas within the project area • Infrastructure is important for development and business; the proposed Uvinza – Msongati railway line will enhance rural developments 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<ul style="list-style-type: none"> The railway line is traversing through Asante Nyerere area a swampy area where people are engaging in paddy cultivation; construction and management of railway line in this area would be very expensive and would require attention. Kasulu district is the main producer of maize, cassava and beans and Burundi is the main market for these crops; the proposed railway line would enhance transportation and therefore improve business. Railway line through protected areas I.e Matete trees in Mubondo. Agricultural College which is managed by the community and malagalasi wetland should be avoided . 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<ul style="list-style-type: none"> The proposed railway line is expected to pass about 1.3km in military area called MTABILA, need relocation or agreement with military officials <p>The project will also pass through area of MAT Mubondo College as well as interfere with the proposed Kasulu bypass road.</p> <p>The challenges of having the SGR built in the area include, dust production during construction activities, Health and safety risks for community close to the project such as Schools, houses, Increase in spread of diseases, environmental pollution.</p> <p>Unavailability of solid waste dumping area</p>	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>and ponds for liquid waste discharge. But there area for wastes management will be planed.</p> <p>Main sources of water are rivers which are used for by the communities therefore, during implementation of the project all the water sources should be protected.</p> <p>There are 33 dispensaries, 6 health centers and 1 District hospital</p> <p>Security and protection continues to be strengthened in various areas</p>	
Buhigwe District Council	FGD	2023-06-23	12	11	1	<ul style="list-style-type: none"> TRC should consider relocation of the proposed railway station from Kigadye to Kilelema because 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>Kilelema is more close to Burundi boarder and accessible to Burundi.</p> <ul style="list-style-type: none"> • Buhigwe is new district council, therefore, it needs infrastructure such as railway station to boost its economy. • Kilelema is potential for agricultural production and major contributor of the council's revenue, the presence of railway station will stimulate agricultural production and therefore increase the council's revenue. • Bringing a railway line and station at Kilelema will save more people that being located at Kigadye where the railway traverse farms and forest. • There is plan to build a bridge at Kilelema connecting to Burundi, by bringing the railway line which will also construct a bridge, the funds for the proposed bridge could be saved and used for development project. 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<ul style="list-style-type: none"> The approved ESIA report should be shared to the authority council's authority for easy follow up of ESMP Facilitate GRM committee to perform its functions Ensure sectoral involvement in the project implementation There is waste management systems in the district The contractor should ensure dust suppression and avoid environmental pollution during project implementation 	
TANZANIA FOREST SERVICES AGENCY (TFS) Mohamed Ramadhani – CR II	Interview	2023-05-31	1	0	1	<ul style="list-style-type: none"> Ensure no disruption of wildlife crossing the Msebei Hill The existence of wildlife and dispersal areas within/close to the SGR project area The common animals found in TFS 	<p>Design measure will consider wildlife crossing</p> <p>At Mlima Msebehi there are elephants found crossing the village road to the field crops and from the</p>

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>areas close to the SGR project area</p> <ul style="list-style-type: none"> TFS requested about the location of wetlands within or near to the proposed SGR project and what are they used for The protection of the forest and any economic activities conducted in the forest reserved area What should be done to ensure the TFS forest areas are well protected during project implementation The benefits of having SGR project in TFS areas <ul style="list-style-type: none"> TFS were asked about the challenges of having SGR project on their reserved forest This is very important project and would be useful for development of Kasulu district, The benefits of having SGR railway in Kasulu areas are ; the project will 	<p>proposed area for SGR line in TFS area, the location of wildlife corridor is farway.</p> <ul style="list-style-type: none"> The common wildlife found in TFS areas close to the SGR project area include Dik-dik, leopard, mongoose, hyena and elephants. The areas with wetland found in the TFS forest are about 1.5km away from the Ruchugi village road however, most of the wetlands have been disappeared due to climate change, and villagers use as sources of water for their

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Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>facilitate the transportation of passengers and freight, and increase of employment opportunities.</p> <p>The Stakeholders from Kasulu District Council requested to know the proposed SGR alignment.</p> <ul style="list-style-type: none"> The institutions that are present within Kasulu DC and can be indirect impacted by the SGR project. 	<p>domestic use.</p> <ul style="list-style-type: none"> The forest reserved area is well protected and economic activities which are allowed with specific permissible permit is beekeeping because it does not directly affect the environment. There must be good communication and cooperation between TRC and TFS when implementing the SGR projec TFS requested to be engaged during site clearance in order to compensate their acquired area by taking all the cut

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Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
							<p>trees.</p> <p>Environmental education to be provided to the near be communities where the SGR projected will be implemented</p> <ul style="list-style-type: none"> • To ensure enough security to all areas which will not be taken by considering the boundaries • TFS requested that before project implementation, the nearby communities should be provided with good water infrastructure. • TFS replied that the SGR project will improve the means of transportation and communication also increasing in economic development through

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
							conducting tourism in the forest areas.
Lake Tanganyika Water Basin	Interview	2023-06-01	1	1	0	Ensuring the protection of Malagarasi and Luche Rivers, and three catchment areas affected by the project	
Uvinza District Commissioner Office	Interview	2023-06-01	1	0	1	<ul style="list-style-type: none"> The need to align the project with strategies for trans-border trade, Improving HIV aids awareness along with the Project, ensuring that land disputes are minimized 	HIV/AIDS awareness will be prepared and undertaken in different stages of the project implementation
Tanroads HQ	Interview	2023-06-05	1	1	1	Data sharing and ensuring no interference between roads and the railway on water structures, bridges, and culverts	TRC and the contractor will ensure proper consultation with various institutions responsible for various utilities/infrastructures
TANESCO – UVINZA Eng. Wilson W. Lukyaa – District		2023 – 06 12				<ul style="list-style-type: none"> There is a high increase in electricity consumption therefore, there will be an additional increase of power generation station. 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
Manager						<ul style="list-style-type: none"> Community awareness should be well implemented before and during implementation of the project. Communication among all stakeholders should be practised in order to avoid miscommunication. 	
Ministry of Works and Transport	Interview	2023-06-05	1			Comply to EMA act in the railway construction	
TAWIRI	Interview	2023-06-16	2	0	2	Provide sufficient crossing to ensure smooth movement of wildlife	Design measures will apply
Jane Goodall Institute	Interview	2023-06-16	1	0	1	No threat to Chimpanzee because the project traverse in an area not common to them	
TANESCO Uvinza	Interview	2023-06-12	1	0	1		
Ruchugi	Public meeting	2023-06-15	49	13	36	1. Compensations for seasonal crops 2. Regular consultation and timely communication with affected communities 3. Competition for social Services with the construction camps	1. Time will be provided for the PAP to harvest 2. This will be done by both the project implementer and contractor 3. To be considered in the plan
Msebei	Public meeting	2023-06-15	36	9	27		

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
Basanza	Public meeting	2023-06-15	58	6	52	4. Execution of the project with no further delays 5. Employment opportunities for youth 6. Whether the resettlement will cover costs on relocation of cattle 7. A participatory relocation of affected schools 8. Fair and timely compensation 9. Construction of crossing areas for roads 10. Compensations relating to Camps, access roads, borrow pits and other sites outside the alignment 11. Education/awareness for Communities and construction workers on HIV aids and GBV issues 12. Ensuring rights of wives/women in the RAP process	4. To be considered in the plan 5. Construction labor practices will comply to Tanzania labour laws and local content policy 6. Yes 7. Relocated in consultation 8. Indicated in the RAP 9. After the Design 10. From RAP? 11. From RAP? 12. From RAP?
Rungwe Mpya	Public meeting	2023-06-16	95	23	72		
Nyamsanze	Public meeting	2023-06-16	38	17	21		
Kagaruka	Public meeting	2023-06-16	61	24	37		
Sogeeni Kwiliba	Public meeting	2023-06-16	42	18	24		
Nyamnyusi	Public meeting	2023-06-17	87	23	64		
Katonga	Public meeting	2023-06-17	39	5	34		
Nyakitonto	Public meeting	2023-06-17	39	12	27		
Heru Ushingo	Public	2023-06-18	42	18	24		

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
	meeting						
Katundu	Public meeting	2023-06-18	45	5	40		
Lugoma	Public meeting	2023-06-18	88	25	63		
Kigadye	Public meeting	2023-06-18	24	7	17		
Kidyama	Public meeting	2023-06-20	48	17	31		
Mwenda	Public meeting	2023-06-20	38	3	35		
Ruhita	Public meeting	2023-06-20	45	4	41		
Murufiti A	Public meeting	2023-06-20	91	48	43		

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
Kanazi (Tabirugu, Luzilampene, Nyakabondo, Migogwe, Nyangive)	Public meeting	2023-06-20	84	5	79		
Nyansha	Public meeting	2023-06-21	63	22	41		
Kumbanga	Public meeting	2023-06-21	36	3	33		
Kumhama	Public meeting	2023-06-21	77	33	44		
TANROADS Kigoma	Interview	2023-06-20	1	1	0		
TATO A - MK – Kasulu Cargo	Interview	2123-06-22	1	1	0	<ul style="list-style-type: none"> Mitigate business disruption for transporters The proposed SGR project will affect our businesses because more people will prefer to use SGR The common commodities transported by the company include construction materials, clothes and 	Consider alternative route for transportation particularly, in areas where there is no SGR

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						agricultural products	
TCCIA Kasulu	Interview	2023-06-21	1	1	0	Enhancing the role of Kasulu as a business hub	
Fire and Rescue Kasulu	Interview	2023-06-21	1	0	0	A fire substation at the new Station, Safety and rescue compliance during construction	
Kasulu District Hospital	Interview	2023-06-21	2	1	1	Data and statistics on diseases including HIV and health services capacity	
Kikundi Cha Maarifa na Taarifa Kasulu (GBV-NGO)	Interview	2023-06-21	1	1	0	<ul style="list-style-type: none"> Partnership with local and International NGOs on GBV matters Prevent patriarchy, Family disintegration and abandonment cases especially during compensations 	Local NGOs will be involved in providing public awareness in matters related to GBV and HIV/AIDS issues Awareness campaign will be emphasized
TARURA	Interview	2023-06-22	2	2	0	<ul style="list-style-type: none"> Tarura is aware of the proposed project through mass media but TRC have not consulted them. TRC and the contractor should make proper consultation with Tarura to 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>undertake the road network of in Kasulu Town and District Councils.</p> <ul style="list-style-type: none"> Tarura has a road network of 1,264.1km of which 519.97km are feeder roads, 583.9 are collector roads and 160.3 are community roads. Bridges for collector and feeder roads should improve before commencement of the project. Tarura has its own borrow pit located in Kanazi while rock quarry is in Makere village. Water availability for construction activities is a challenge during dry season of September and October 	
Endeleza Wazee Kigoma (EWAKI)	Interview	2023-06-22	2	0	2	<ul style="list-style-type: none"> The NGO was established in 2018, currently, it has 14 staff with degree and diploma education It is responsible for providing material 	Public awareness will be provide at different stage of the project implementation

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						support to elders <ul style="list-style-type: none"> Community awareness about the project is very important, particularly to vulnerable people like elders, orphans and female headed households. The NGOs like EWAKI should be facilitated to provide awareness on the impact of the project to the communities Ensure timely and fair compensation to PAPs Elders who will be affected by project should be supported to access their compensation 	RAP will be prepared and provide guidance on the people will be compensated based on Tanzanian laws. Livelihood Restoration Program will be prepared to take into consideration of elders and other vulnerable
JKT Matabila	Interview	2023-06-22	4	4	0	<ul style="list-style-type: none"> There are plan to construct new infrastructure within the camp, this why they acquired more from the villagers The valuation of the acquired land was conducted in February, 2023 and 	

Location/Institution	Consultation nature	Date	Participants	M	F	Key concerns	Response/Measures
Ministry Works and Transport Eng. Hassan Ally – Civil Engineer and Ecklesia Sironga – Environmental Officer		07-06-2023	1	1	0	The country has decided to develop standard gauge for all new railways that will be developed e.g Dar-Tabora –Isaka-Mwanza, Isaka-Keza-Kigali-Msongati, Mtwara –Mbamba bey-spur to Liganga and Mchuchuma, etc; this decision is according to EAC agreement among the member states to have common railway system	
						<p>the government is in the process of compensating the PAPs</p> <ul style="list-style-type: none"> Consider re-alignment of the line because the current alignment will be close to planned development The current alignment will affect camp's source of water and underground water pipes to the camp 	
RUWASA	Interview	2023-06-23	1	1	0	<ul style="list-style-type: none"> There is underground water pipe system in both Kasulu D.C and T.C Sharing of information between RUWASA, TRC and contractor is important to avoid unnecessary destruction of water infrastructure 	The contractor will communicate with the responsible authorities to ensure smooth relocation and replacement of affected infrastructure.

12.4 NEMC Letter Screening Decision



NATIONAL ENVIRONMENT MANAGEMENT COUNCIL (NEMC)

BARAZA LA TAIFA LA HIFADHI NA USIMAMIZI WA MAZINGIRA

Tel: Dir: +255 22 277 4852
Tel: +255 22 277 4889
Mob: +255 713 - 608930
Fax: +255 22 277 4901

E-mail: dg@nemc.or.tz
Website: www.nemc.or.tz

In reply please quote:

Ref: NEMC/HQ/EIA/11/0222/V&T:1/02

Regent Estate Plot No. 29/30,
P.O. Box 63154,
DAR ES SALAAM
TANZANIA

Date: 26/01/2015

Managing Director,
Reli Assets Holding Company,
P.O. Box 76959,
Dar es Salaam.

RE: PROPOSED CONSTRUCTION OF RAILWAY LINE FROM UVINZA-MUSONGATI (BURUNDI) RAILWAY LINE

Kindly refer to the subject above.

We acknowledge receipt of your letter with Ref. No. TS/hs/363 of 15th December, 2015 attached with three copies of a duly-filled Environmental Impact Assessment certificate application form and ten copies of the project brief for the above mentioned project. Kindly be informed that the project has been registered with Application Reference Number (ARN): **5433**. We advise you to refer to this ARN whenever you communicate with the Council concerning this project.

Based on the scrutiny of the documents and according to the Environmental Management Act Cap 191 and the subsequent EIA and Audit Regulations of 2005, your proposed undertaking falls on the list of projects that require a full Environmental Impact Assessment (EIA) study. You are thus required to prepare scoping report and draft Terms of Reference (ToR) and submit the same to the Council for review and approval before the beginning of EIA study of your proposed project.

Be reminded also that:

- i. H.P. Gauff Ingenieure GmbH & Co. KG-JBG- is not registered by NEMC as a firm of Environmental Experts, thus it should refrain from doing EIA study as it is contrary to Environmental Management Act, 2004 and its Regulations. Hussein Sosovele is the one registered and he is in the Central Register of Registrar of Environmental Experts. If H.P. Gauff Ingenieure GmbH & Co. KG-JBG-wishes to be the firm of environmental Experts, it should adhere to the requirements of Environmental Management Act, 2004 and its Regulations.
- ii. The scoping report should conform to the EIA and Audit Regulations 2005 particularly Regulation 13 (3) and the Fourth Schedule made under Regulation 15 for the contents of the scoping report and the essence of the scoping exercise respectively.
- iii. Stakeholders' consultation should be done during the scoping exercise.

Should there be any need for more clarification or information on this process we can be contacted through telephone number +255 659 61 51 36.

Looking forward to your cooperation on this matter.

Yours Sincerely,



Dr. M.H. Makene

For: Director General.

Cc: H.P. Gauff Ingenieure GmbH & Co. KG-JBG-,
P.O BOX 4351, **Dar es Salaam**

Hussein Sosovele,
East African Resource Group
P.O. Box 35631, **Dar-es-Salaam.**

12.5 NEMC letter Approval of Terms of Reference and Scoping Report



**NATIONAL ENVIRONMENT MANAGEMENT
COUNCIL (NEMC)**
BARAZA LA TAIFA LA HIFADHI NA USIMAMIZI WA MAZINGIRA

Telephone: +255 22 2774889,
Direct line: +255 22 2774852
Mobile: 0713 608930
Fax: +255 22 2774901
Email: dg@nemc.or.tz
Website: www.nemc.or.tz

35 Regent Street,
P. O. Box 63154
11404 Dar es Salaam
TANZANIA

In reply please quote:

Ref: **NEMC/HQ/EIA/11/0222/Vol. I/02**

Date: **08/07/2016**

Managing Director,
Reli Assets Holding Company,
P.O. Box 76959,
Dar es Salaam.

**RE: APPROVAL OF TERMS OF REFERENCE FOR THE PROPOSED
CONSTRUCTION OF RAILWAY LINE FROM UVINZA-
MUSONGATI (BURUNDI) RAILWAY LINE**

The above captioned subject refers.

We acknowledge receipt of your letter with Ref. no. DAR/hs/149 dated 17th June, 2016 submitted with ten copies of the Scoping report and the draft Terms of Reference (ToR) for undertaking EIA study of the above mentioned project.

Following review of the submitted ToR, the Council wishes to inform you that they have covered most of key issues that are required to be addressed during the EIA study and thus the ToR are hereby approved. You will now be required to undertake full EIA study according to the requirements of the Environmental Management Act Cap 191 and subsequent Environmental Impact Assessment (EIA) and Audit Regulations, 2005 particularly Regulations 51 and 52. Therefore, submit fifteen copies of the Environmental Impact Statement (EIS) to the National Environment Management Council for review.

Please ensure that, the EIS addresses the best option of the proposed railway line route and give stern mitigation measures in accordance with views and concerns provided by pertinent stakeholders including the Ministry of Natural Resources and Tourism and the Ministry of Lands, Housing and Human Settlements Development; and a study on the existing flora and fauna should be done and an inventory attached in the EIS.

Upon submission of the EIA report, the Council will arrange for a technical review of the document by the cross-Sectoral Technical Advisory Committee (TAC). Prior to the review, representatives of the TAC will visit the proposed project area to inspect the site and verify the adequacy of the EIA report.

The budget for these review activities amounts to *Ten million five hundred thirty eight thousand shillings* (Tshs. 10,538,000/=) as elaborated on the attached sheet (**Attachment AA**). The funds can be paid by Cheque or in Cash to NEMC's Account No. 2011100084, NMB, Branch: **Bank House**. swift code NMIBTZTZ Account name: **National Environment Management Council**

In case you need further clarification on this matter, please do not hesitate to contact us on Tel No. 0659-615136.

Yours Sincerely,


Arnold Kisiraga
For: Director General.

Cc: H.P. Gauff Ingenieure GmbH & Co. KG-JBG-,
P.O BOX 4351, **Dar es Salaam**

East African Resource Group,
P.O. Box 35631, **Dar-es-Salaam.**

12.6 Type and quantity of construction materials for Uvinza – Musongati Railway project

S/N	Description	Unit	Quantity
1	Earthworks		
	Clearing, demolition and Surface preparation	m ²	3,953,563
	Excavation including cut to spoil	m ³	13,102,688.9
	Rock Excavation and Fill	m ³	2,897,016.6
	Fill material (Soil) including that from borrow areas	m ³	13,666,740.8
	Improved Subgrade	m ³	66,712.1
	Geogrid for Roadbed and Embankment base	m ²	806,863.7
	Subbase layer	m ³	506,445.0
2	Superstructure/Permanent Way		
	Laying of Rails (UIC 60 & UIC 54)	M	418,708.0
	Laying of Pre-stressed Concrete Slippers	Pcs	348,925.0
	Ballasting	Tons	736,970.4
	Laying of Turnouts - 1:12 & 1:14	Pcs	31.0
	- 1:9	Pcs	6.0
	Bufferstops	Pcs	14.0
3	Drainage		
	Construction for Open Drains (Ditch)	M	338,941.5
	Construction for Underground Drainage	M	3,000.0
4	Station Facilities and Buildings including Roads		
	Construction of Platforms including tactile paving, edges and roofing	m ²	23,293.2
5	Structures		
	Box Culverts		
	Excavation	m ³	43,162.0

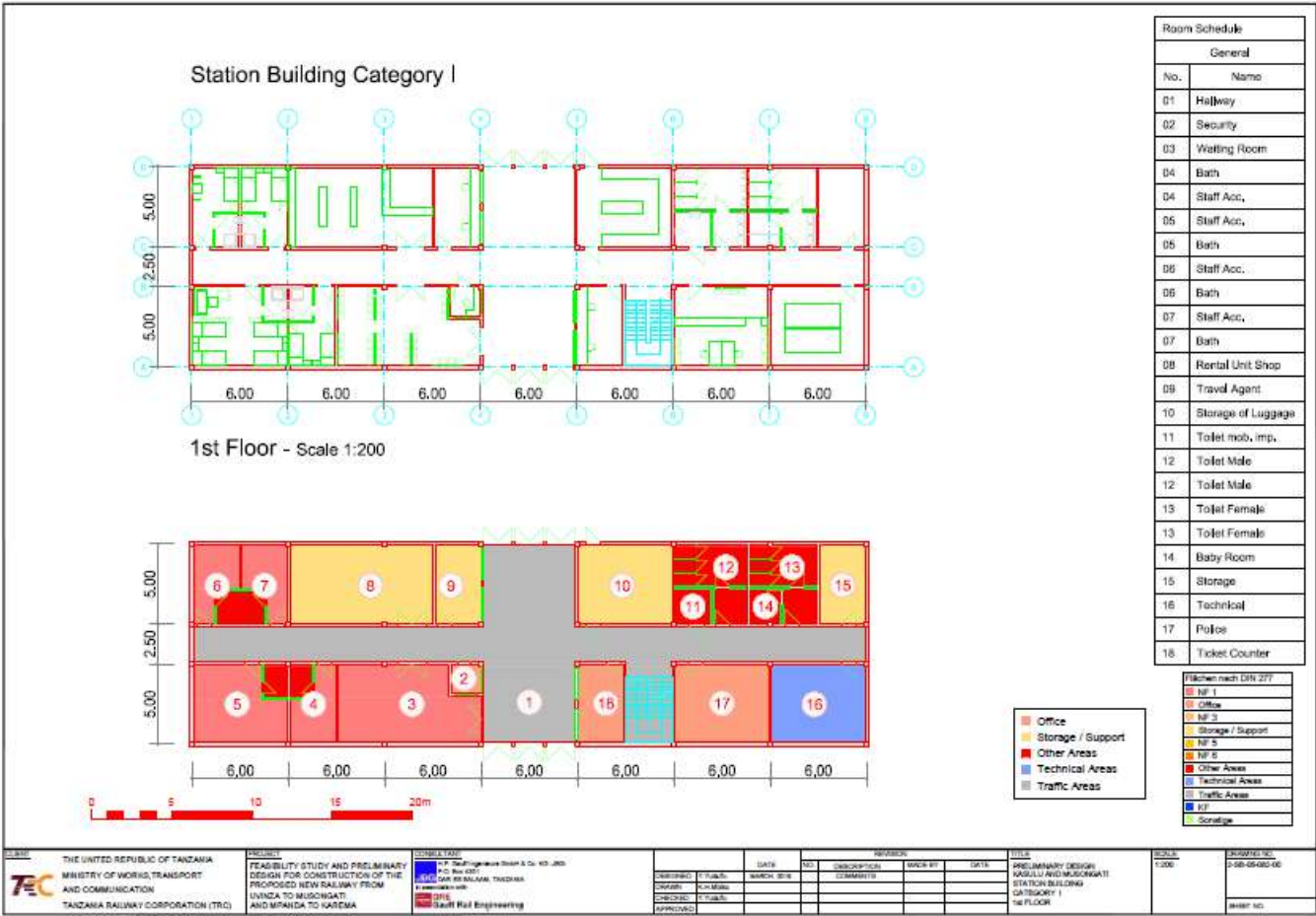
S/N	Description	Unit	Quantity
	Concrete Class 15	m ³	988.0
	Concrete Class 30 for wingwalls, apron etc	m ³	18,961.0
	High Tensile Steel Reinforcement Bars	Tons	3,129.0
	Bridges		
	Excavation	m ³	64,732.7
	Concrete Class 30	m ³	29,612.7
	Concrete Class 45 for Piers, Desk slab etc	m ³	51,073.8
	Structural Steel as per ASTM 709 GRADE 50	Tons	10,009.0
	High Tensile Steel Reinforcement Bars	Tons	15,738.9
	Viaducts		
	Excavation	m ³	197,905.1
	Concrete Class 30	m ³	150,320.0
	Concrete Class 45 for Piers, Columns etc	m ³	148,214.0
	Prestressed Tendons 12 dia	Tons	261.3
	High Tensile Steel Reinforcement Bars	Tons	56,652.2
	Level Crossing		
	Excavation	m ³	27,864.8
	Concrete Class 30	m ³	16,564.6
	Concrete Class 45	m ³	9,205.6
	Structural Steel as per ASTM 709 GRADE 50	Tons	2,700.0
	High Tensile Steel Reinforcement Bars	Tons	4,745.0
	Fill G7/G3	m ³	65,570.3
	G25	m ³	2,909.0
	C1	m ³	

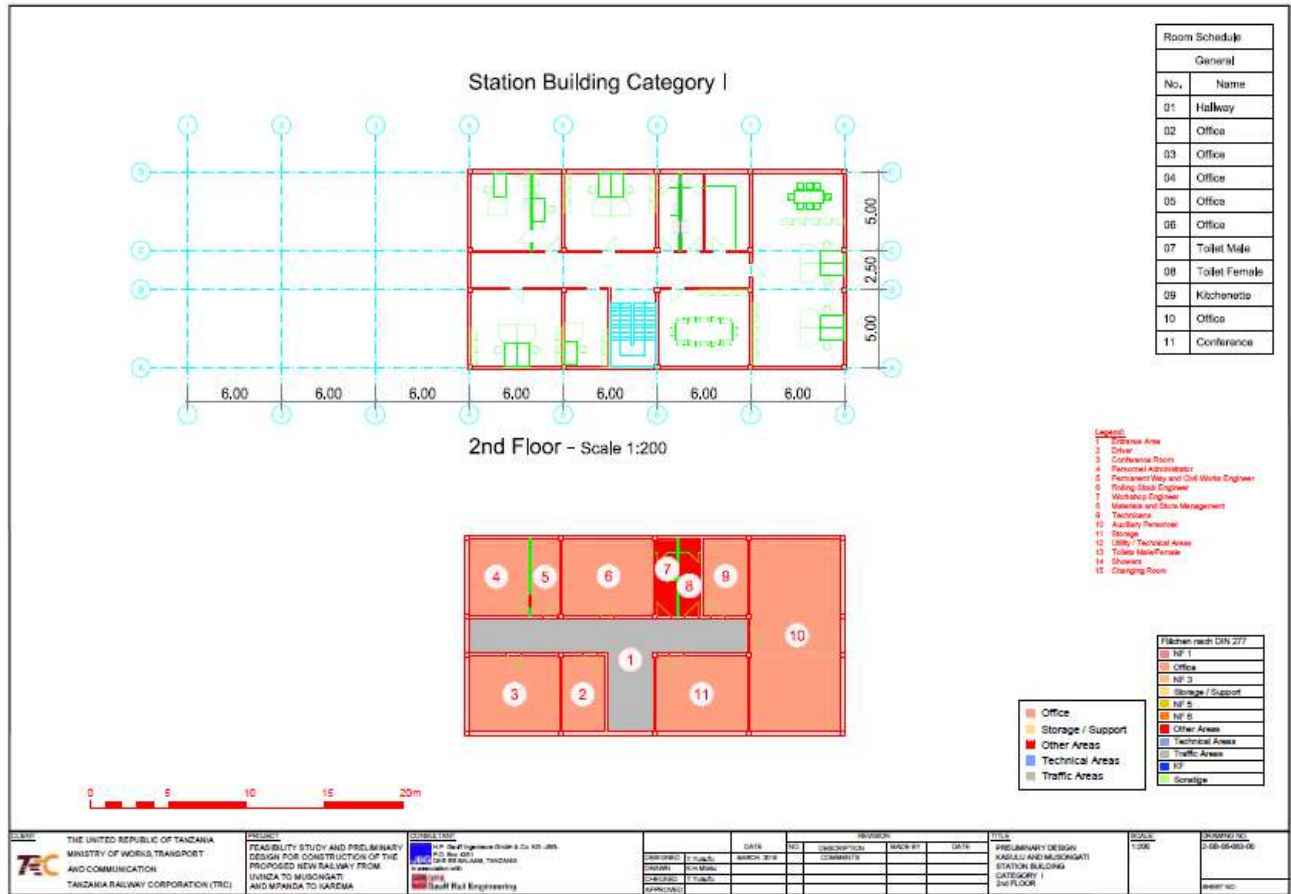
S/N	Description	Unit	Quantity
			3,246.1
	C2	m³	4,328.2
	AC 20	m³	1,082.0
	Bitumen for Level Crossings	Tons	112.0
6	Power Supply		
	Power System for station buildings, Workshops & Maintenance Facilities	Lampsum	8.0
	Platforms	Lampsum	7.0
	Solar Emergency power supply	Lampsum	6.0
	Lightning, Cables switchgears, solar power supply	Lampsum	1.0
7	Signalling and Telecommunications		
	Electronic Interlocking (Indoor & Outdoor equipment incl.Workstaton for local control	Lampsum	8.0
	Power Supply (UPS, Batteries etc)	Lampsum	7.0
	Signalling Cable	M	36,000.0
	Radio Block Centre	Lampsum	1.0
	Cable Closures	Lampsum	8.0
	Public Address System	Lampsum	8.0
	Automatic Fire Detection System	Lampsum	8.0
	Intrusion Detection system and Access Control system	Lampsum	8.0
	Time service equipment	Lampsum	8.0
	Power supply	Lampsum	8.0
	GSM-R	Lampsum	8.0
	SCADA	Lampsum	8.0
	Cabling (FOC -Redundant fibre ring including junctions)	Km	480.0

S/N	Description	Unit	Quantity

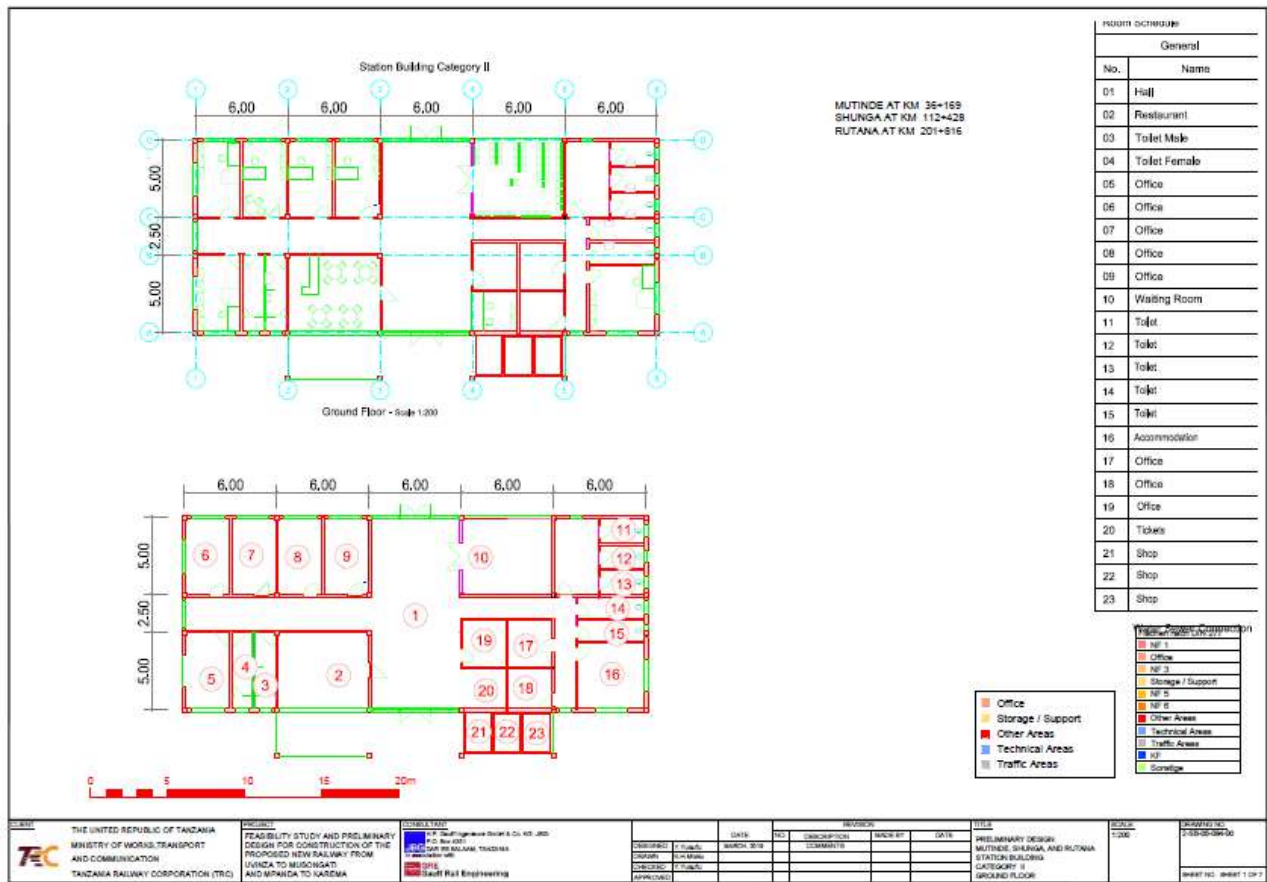
12.7 Design of railway stations for category 1, 2 and 3 Buildings

12.7.1 Design of Railway Station Category 1 buildings

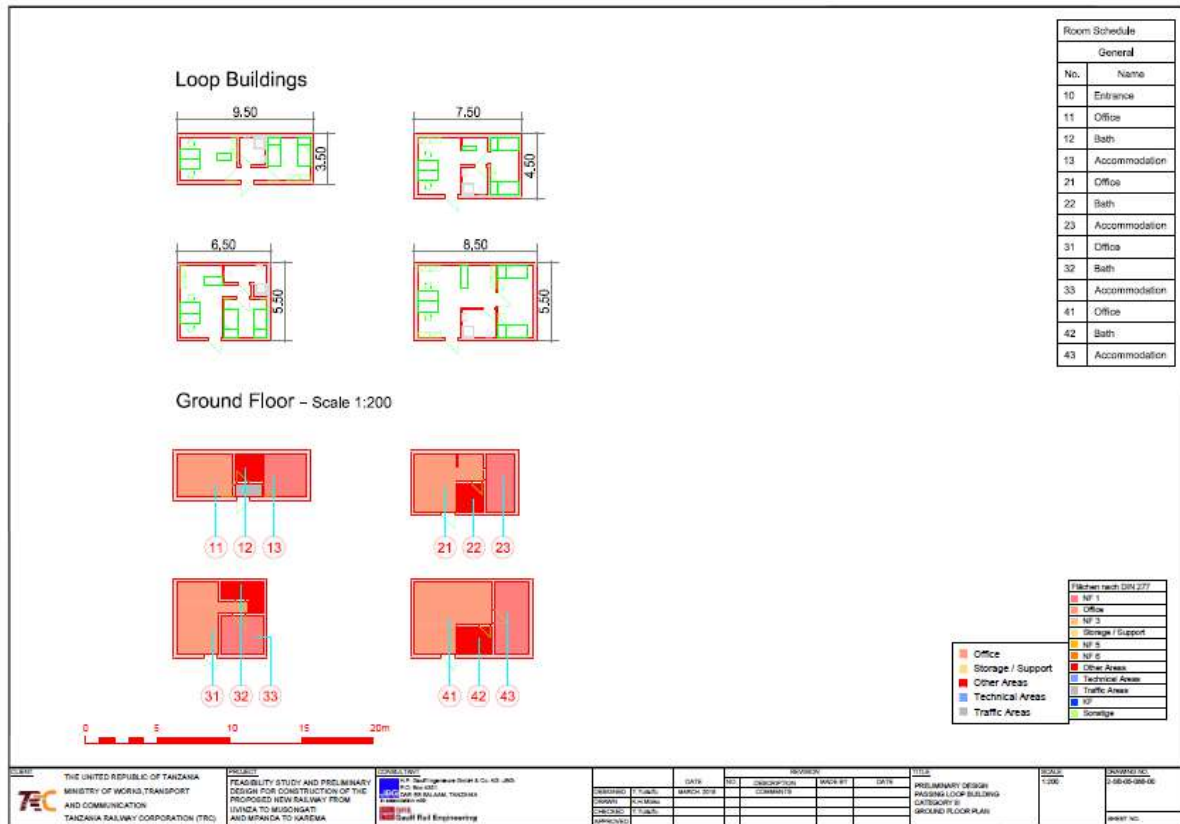




12.7.2 Design of Railway Station Category 2 buildings



12.7.3 Design of Railway Station Category 3 buildings



12.7.4 Signature of stakeholders consulted

Attached is part of immensity signatures of stakeholders that will be submitted separately

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF
RAILWAY LINE FROM UVINZA-TANZANIA TO MSONGATI-BURUNDI

2016

STAKEHOLDER'S SIGNATURE FORM

S/N	NAME	ORGANIZATION	POSITION	CONTACT	SIGNATURE	DATE
1	KIMNAA.A. MASSAWE	MINISTRY OF LANDS	SENIOR TOWN PLANNER	0767426021	Massawe	19.09.20
2	PICKSON NYEMA	MUHASID	PTP	0713402148	Pickson	19.09.20
3	SIFAMEN A. SEKEI	MOWTC	ADES	0954836234	Sifamen	21-09-2
4	Eng. Thomas E. Ngulika	MOWTC	ADP	0753740017	Ngulika	21.09.2
5	Hassan Mabuka	MOWTC	STO	0713407330	Mabuka	21.09.20
6	FESTO M. MWANYIKA	MOWTC	ADRTS	0787-122994	Mwanyika	21/9/2016
7	Said Marussa	—/—	TO	0713480589	Marussa	21/9/201
8	Eng. DONJO M. NGELI	Town Roads	Off Environmental	0715373630	Ngeli	25/10
9						
10						

ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED UVINZA – KASULU - MSONGATI
RAILWAY PROJECT


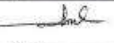
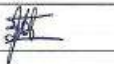
TATHMINI YA ATHARI YA KIMAZINGIRA NA KIJAMII – UJENZI WA RELI KUTOKA MPANDA – KALEMA

S/ N	NAME/JINA	INSTITUTION/TAASISI	POSITION/CHEO	PHONE/SIMU	SIGNATURE/ SAHIHI
1	Bernard Ruyonyo	Uvinza District Council	Asst DEO	0753-110-318	Ruyonyo
2	Peter Wambura	—/—	DEO DT	0763 066088	Wambura
3	Frank Magaburo	—/—	DEO	0683980243	Magaburo
4	SALIFU E. VERAANCE	—/—	DPO	0765-910548	Veraance
5	Zacharia Nkhalu	—/—	DE	0768-473809	Nkhalu
6	WILLIAM D. HASWI	—/—	T.P.O	0767-810340	Haswi
7					
8					
9					

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED DEVELOPMENT OF
RAILWAY LINE FROM UVINZA-TANZANIA TO MSONGATI-BURUNDI**




2016

STAKEHOLDER'S SIGNATURE FORM

S/N	NAME	ORGANIZATION	POSITION	CONTACT	SIGNATURE	DATE
1	LAMECU E. KAMANDO	SUMATRA	S RIO	0767-422608		19/09/12
2	HANYA M. MBAWALA	SUMATRA	RAILWAY SAFETY INSPECTOR	0767 582771		19/09/12
3	Eng JOHN C. NGARA GUZA	RTD ENGINEER		0754469935		19/09/11
4						
5						
6						

**ENVIRONMENTAL AND SOCIAL IMPACT ASSESSMENT FOR THE PROPOSED UVINZA - KASULU - MSONGATI
RAILWAY PROJECT**

TATHMINI YA ATHARI YA KIMAZINGIRA NA KIJAMII - UJENZI WA RELI KUTOKA MPANDA - KALEMA

S/ N	NAME/JINA	INSTITUTION/TAASISI	POSITION/CHEO	PHONE/SIMU	SIGNATURE/ SAHIHI
1	ASHERY LUKOTORA	R/impya	MICHI 81055	0756966719	
2	HALFAN KUYOGERA	R/impya	NEO	0764234352	
3	TELUSA JELEMA	R/impya	MJUMBE		J. J.
4	MDELE HOLOGA	R/impya	KITOMBOTI		M.H.
5	RAZALO KINAMA	R/impya	MJUMBE		Razalo
6	AMONI PETRO	R/impya	MJUMBE	0762992911	
7	FILISIA KIMWASA	R/impya	MKULIMA		F. S.
8	AJELINA KIVUTA	R/impya	MKULIMA		A. Kivuta
9	SITELIA ELIYAKIMU	R/impya	MKULIMA		S. Eliyakimu
10	REHEMA KODA	R/impya	MKULIMA		R. H.
11	NEZIA WILIAM	R/impya	MKULIMA		N. Z.
12	ALESI NIIBIBUKA	R/impya	MKULIMA		A. N.